

## No Help

There is no help available on this topic.

Top of file F1\_Edit

## No Help

There is no help available on this object.

This functionality is currently not supported.

# Main Windows

Author note: Popup listings were added to the menus topic because of the number. There are too many for the See Also button.



## Using the Visual Cafe window

```
{button Concepts,AL('Visual_Cafe_welcome_overview;Menus_F1;Toolbars_visual_F1;Palette_F1')} {button How  
To,AL('Opening_a_Project_howto',0,','')}
```

The Visual Cafe window is the main interface to the Visual Cafe development environment.

The window consists of three main elements:

- menus
- toolbars
- Component Palette

Closing the Visual Cafe window closes the application.



## Using Visual Cafe menus

```
{button Concepts,AL('Visual_Cafe_window_F1')} {button See  
Also,AL('Visual_Cafe_Tools_overview;Toolbars_visual_F1',0,'')}
```

The Visual Cafe menus provide access to all Visual Cafe functionality.

These are the standard menus that are always available:

File	Edit	View
Search	Project	Insert
Tools	Window	Help

```
{button ,PI('VCAFE.HLP','Popup_Standard_menu_listing')} Click here for quick access to standard menu help.
```

The availability of the following menus depends on the tool you are currently using:

Object	Run	Source
Layout	Calls	Threads
Breakpoint	Variables	

```
{button ,PI('VCAFE.HLP','Popup_secondary_menu_listing')} Click here for quick access to menu help.
```

There are also several pop-up menus that are dependent on the active object:

Project window	Form Designer
Class Browser	Menu Designer
Source window	Hierarchy Editor

```
{button ,PI('VCAFE.HLP','Popup_popup_menu_listing')} Click here for quick access to popup menu help.
```

[File Menu](#)

[Edit Menu](#)

[View Menu](#)

[Search Menu](#)

[Project Menu](#)

[Insert Menu](#)

[Tools Menu](#)

[Window Menu](#)

[Help Menu](#)



[Object Menu](#)

[Run Menu](#)

[Source Menu](#)

[Layout Menu](#)

[Calls Menu](#)

[Threads Menu](#)

[Breakpoint Menu](#)

[Variables Menu](#)

[Objects View Pop-up Menu](#)  
[Packages View Pop-up Menu](#)  
[Files View Pop-up Menu](#)  
[Form Designer Pop-up Menu](#)  
[Menu Designer Pop-up Menu](#)  
[Class Pane Pop-up Menu](#)  
[Member Pane Pop-up Menu](#)  
[Hierarchy Editor Pop-up Menus](#)  
[Source Window Pop-up Menu](#)

# Menus

Author's note: individual command topics were added because the engineers did not have time to fix the software to assign unique helpid numbers to each command. This caused the wrong menu topic to display for the relative position of the command. For example, the Cut command is used 4 places in the software and can only be mapped to one helpid string.

### **Third-party menu item**

This menu item was created by a third-party product you have integrated into Visual Cafe. Consult the documentation that came with this product for more information.



## Help menu

```
{button See Also,AL('Menus_F1',0,'','')}
```

The following options are available from the Visual Cafe Window Help menu:

### **Help Topics...**

Opens the Content listing for the Visual Cafe online help. The online help provides task and context sensitive information.

### **Java API Reference...**

A reference of all Java packages, classes and interfaces for each package. Variables, constructors, and methods are also included.

### **Java Language Reference...**

Opens the Content listing for the Java Language Reference.

### **Macro Reference...**

Opens the Content listing for the Java Language Reference.

### **About Visual Cafe**

Displays version and copyright information for this release.

### **LiveUpdate**

Helps you update your software across the Internet through a Symantec Web site. Before you can use LiveUpdate, you must register at the Symantec update center; after registering, you are given a file that enables LiveUpdate.

## **User's Guide...**

Opens the Content listing for the Visual Cafe User's Guide. This document provides conceptual information about Visual Cafe.

## **Help Topics...**

Opens the Content listing for the Visual Cafe online help. The online help provides task and context sensitive information.

## **Java API Reference...**

A reference of all Java packages, classes and interfaces for each package. Variables, constructors, and methods are also included.



## **Java Language Reference...**

Opens the Content listing for the Java Language Reference.

## **Macro Reference...**

Opens the Content listing for the Macro Reference.

## **About Visual Cafe**

Displays version and copyright information for this release.

## **LiveUpdate**

Helps you update your software across the Internet through a Symantec Web site. Before you can use LiveUpdate, you must register at the Symantec update center; after registering, you are given a file that enables LiveUpdate.



## File menu

```
{button  
Concepts,AL('New_Project_dialog_F1;New_File_Dialog_F1;Find_in_Files_dialog_F1;Environment_Options_Dialog_F1',0,','')}  
{button See Also,AL('Menus_F1',0,','')}
```

The following options are available from the Visual Cafe Window File menu:

### **New File**

Opens the New File dialog box so you can select the type of file to create.

### **Open...**

Opens the Open File dialog box so you can select and open a Visual Cafe project (**.vep**), HTML file, or Java source file (**.java**).

### **Close *item***

Closes the active file, view, or project. The menu option reflects the name of the active object. The default command is "close project." When a project closes, all windows associated with that project also close. Visual Cafe prompts you about any unsaved changes.

### **New Project...**

Opens the New Project dialog box so you can create and open a new [project](#).

### **Open Project...**

Opens the Open File dialog box so you can select and open a Visual Cafe project (**.vep**).

### **Close Project...**

Closes the active project.

### **Save *item*, Save As, Save All**

Saves files to disk. Functionality is the same as MS Windows. If no window is open, the default is "Save Project."

### **Print Setup, Print...**

Configure printing and print active window. Functionality is the same as MS Windows.

### **Recently Opened Files**

Lists recently opened files. Choose a file to open it.

### **Exit**

Closes any open projects and files after prompting to save unsaved changes, then closes Visual Cafe.

## **New Project...**

Opens the New Project dialog box so you can create and open a new [project](#).

## **New File**

Opens the New File dialog box so you can select the type of file to create.

## Open...

Opens the Open File dialog box so you can select and open a Visual Cafe project (.vep), HTML file, or Java source file (.java).



**Close *item***

Closes the active file, view, or project. The menu option may reflect the name of the active object. When a project closes, all windows associated with that project also close. Visual Cafe prompts you about any unsaved changes.

**Save *item***

Save the selected item. Functionality is the same as MS Windows. If no window is open, the default is "Save Project."

## **Save As**

Allows you to save the selected item with a new name. Functionality is the same as MS Windows. If no window is open, the default is "Save Project."

**Save All**

## **Print Setup...**

Configure printing. Functionality is the same as MS Windows.

**Print...**

Print active window. Functionality is the same as MS Windows.

## Recently Opened Files

Lists recently opened files. Choose a file to open it.

## **Activate Project**

Makes the selected open project active.



## **Exit**

Closes any open projects and files after prompting to save unsaved changes, then closes Visual Cafe.



## Edit menu

{button How To,AL('Using\_the\_Menu\_Editor\_F1',0,'')} {button See Also,AL('Menus\_F1',0,'')}

The Visual Cafe Window Edit menu provides standard system edit commands such as undo, cut, copy, paste, and delete.

Shortcuts for Edit commands:

Undo	CONTROL + Z
Cut	CONTROL + X
Copy	CONTROL + C
Paste	CONTROL + V
Delete	DELETE
Select All	CONTROL + A

The Select All command has this effect:

<u>If the active window is</u>	<u>Selects all</u>
Form Designer	components
Source window	source in the current method
Breakpoint Window	breakpoints in the list

## Cut/Copy/Paste

Same functionality as MS Window/NT.

Shortcut:

Cut	CONTROL + X
Copy	CONTROL + C
Paste	CONTROL + V

## **Undo**

Undoes the last edit. Same functionality as MS Window/NT.

Shortcut: CONTROL + Z

**Edit ▶Delete  
Breakpoint**

**▶ Clear**

Deletes the selected text, or clears the selected breakpoint. Same functionality as MS Window/NT.

Shortcut: DELETE

## Select All

The Select All command has this effect:

<u>If the active window is</u>	<u>Selects all</u>
Form Designer	components
Source window	source in the current method
Breakpoint Window	breakpoints in the list

Shortcut: CONTROL + A



## View menu

```
{button How To,AL('Using_the_Menu_Editor_F1',0,'')} {button See Also,AL('Menus_F1',0,'')}
```

The View menu lets you change what windows are displayed in the Visual Cafe window.

You can activate the display of these tools:

Property List	Component Library
Hierarchy Editor	Class Browser

You can activate the display of these debugging windows:

Watch	Breakpoint
Messages	Threads
Variables	Call Stack

You can also toggle the display of the Status Bar and Workbook tabs (for MDI).

### Status Bar

Toggle the display of the Status Bar at the bottom of the Visual Cafe main window.

### Workbook

Toggle the display of Workbook tabs at the bottom of the workspace area (MDI mode).

### Project

Allows you to select an open project as the new active main project. The main project is the one that the Project menu commands apply to.

## **Status Bar**

Toggle the display of the Status Bar at the bottom of the Visual Cafe main window.

## **Workbook**

Toggle the display of Workbook tabs at the bottom of the workspace area (MDI mode).



## Open the selected view

You can activate the display of these views:

Property List	Component Library
Hierarchy Editor	Class Browser

## Open the selected window

You can activate the display of these debugging windows:

Watch	Breakpoint
Messages	Threads
Variables	Call Stack



## Project menu

```
{button Concepts,AL('Debugging Your Program',0,',')} {button See  
Also,AL('Menus_F1;Project_Options_Dialog_F1;Projects_overview',0,',')}
```

The following options are available from the Visual Cafe Window Project menu:

### Execute

Compiles and runs the current project with no debugging. Applets are run in the Symantec Applet viewer by default. You set the default viewer in the Project tab of the Project Options dialog box.

### Run in Debugger

Runs the program in debug mode and stops at the first breakpoint.

### Step Into

Begins running the program by stepping into the first line of source code. When used on an applet, this command takes you the applet `void init()` method if one is implemented.

### Build Applet/Application

Builds the applet or application.

### Rebuild All

Builds all files in the active project.

### Compile Item

Compiles the active source file.

### Parse All

Parses all files in the project.

### JAR

Helps you create a Java Archive (JAR) file from the active project.

### Migrate 1.0 to 1.1

Helps you migrate the active source file from the JDK 1.0 event model to the JDK 1.1 event model.

### Add Item

Adds the active file in the Source window to the project.

### Create Project Template...

Opens the Create Template dialog box so you can add a template to the Component Library. Once added, the template is available for the New Project command.

### Options...

Opens the Project Options dialog box where you can define debugger, compiler, project, and directory options.



## **Execute or Compile**

Compiles and runs the current project with no debugging. Applets are run in the Symantec Applet viewer by default. You set the default viewer in the Project tab of the Project Options dialog box.

**Project ▶ Run in Debugger**  
**Debug**

**▶Continue**

Runs the program in debug mode and stops at the first breakpoint.

## Step Into

Begins running the program by stepping into the first line of source code. When used on an applet, this command takes you the applet `void init()` method if one is implemented.

## **Build Applet/Application**

Builds the applet or application.

## **Rebuild All**

Builds all files in the active project.

## **Compile *Item***

Compiles the active source file.



## **Parse All**

Parses all files in the project.

## **Parse**

Parses the selected file.

## JAR

Helps you create a Java Archive (JAR) file from the active project.

## **Migrate 1.0 to 1.1**

Helps you migrate the active source file from the JDK version 1.0 to the JDK version 1.1 event model.

**Add Item**

Adds the active file in the Source window to the project.

## **Create Project Template...**

Opens the Create Template dialog box so you can add a template to the Component Library. Once added, the template is available for the New Project command.

## **Switch Project...**

Allows you to select an open project as the new active main project. The main project is the one that the Project menu commands apply to.

## **Options...**

Opens the Project Options dialog box where you can define debugger, compiler, project, and directory options.





## Insert menu

```
{button How  
To,AL('Adding_a_new_file_to_the_project_howto;Class_Browser_using_F1;Adding_Files_to_a_Project_howto',0,','')} {button  
See  
Also,AL('Menus_F1;Insert_form_dialog_F1;New_Project_dialog_F1;Insert_Object_dialog_F1;Insert_class_dialog_F1;Insert_Me  
mber_dialog_F1',0,','')}
```

The following options are available from the Visual Cafe Window Insert menu. This menu allows you to create new project objects and add forms, files, and objects to the project.

### **Form...**

Opens the Insert Form dialog box so that you can insert a form from the Component Library into the current project.

### **Applet...**

Inserts an applet if there are no saved applet objects, or opens the Insert Applet dialog box where you can select an applet from a list of applet templates.

### **Component...**

Opens the Insert Object dialog box so you can add one or more objects from the Component Library to the active form or to the project.

### **Class**

Opens the Insert Class Wizard, where you can add and define a new class or interface for the current project.

### **Member**

Opens the Insert Member dialog box, where you can declare a method to be added to the current class.

### **Group**

Adds a group to the Component Library. Groups can only be inserted at the root level of the Component Library window or inside other groups.

### **Files into Project.. (Insert/Remove Files)**

Opens a dialog box where you can select one or more files to be added to the project. You can also remove files from the project with this dialog box.

### **Component into Library...**

Opens a dialog box where you can add an external component to the Component Library.

## **Insert Form...**

Opens the Insert Form dialog box so that you can insert a form from the Component Library into the current project.

## **Insert Applet...**

Inserts an applet if there are no saved applet objects, or opens the Insert Applet dialog box where you can select an applet from a list of applet templates.

## **Insert Component...**

Opens the Insert Component dialog box so you can add one or more objects from the Component Library to the active form or to the project.

## **Insert Class**

Opens the Insert Class Wizard, where you can add and define a new class or interface for the current project.

## **Insert Member**

Opens the Insert Member dialog box, where you can declare a method to be added to the current class.

## **Insert Group**

Adds a group to the Component Library. Groups can only be inserted at the root level of the Component Library window or inside other groups.

## **Files into Project..**

Opens a dialog box where you can select one or more files to be added to the project. You can also remove files from the project with this dialog box.



## **Component into Library...**

Opens a dialog box where you can add an external component to the Component Library.

Saves all open items. Functionality is the same as MS Windows. If no window is open, the default is "Save Project."



## Tools menu

```
{button Concepts,AL('Environment_Options_Dialog_F1',0,'')} {button See Also,AL('Menus_F1',0,'')}
```

The following options are available from the Visual Cafe Window Tools menu:

### Compare Files...

Opens the Compare Files dialog box, where you can specify two file to compare. The differences are presented in editing windows, allowing you to view the lines that are different.

### Macro...

As you use the Source editor to create and edit program code, you may find yourself performing some tasks again and again. You can automate the task by turning on the Macro Recorder and having it create a macro for you.

**Record macro** Choose this command before beginning a task in an editing window. Your keystrokes and mouse actions are then recorded. After completing the task, choose Stop Recording from the Macro Menu. You can save the macro for later use.

**Play** After creating a macro, repeat the task you recorded by playing the macro.

**ScriptMaker** Use the ScriptMaker dialog box to copy, name, and edit macros.

### JAR Viewer...

Choose a version control system to use with the active project.

### Version Control...

Choose a version control system to use with the active project.

### Environment Options...

Opens the Environment Options dialog box so that you can customize your Visual Cafe development environment. The options are global and apply to all projects.

## **Compare Files...**

Opens the Compare Files dialog box, where you can specify two file to compare. The differences are presented in editing windows, allowing you to view the lines that are different.

## Macro ▶ Record macro...

As you use the Source editor to create and edit program code, you may find yourself performing some tasks again and again. You can automate the task by turning on the Macro Recorder and having it create a macro for you.

**Record macro** Choose this command before beginning a task in an editing window. Your keystrokes and mouse actions are then recorded. After completing the task, choose Stop Recording from the Macro Menu. You can save the macro for later use.

## Macro ▶ Play...

As you use the Source editor to create and edit program code, you may find yourself performing some tasks again and again. You can automate the task by turning on the Macro Recorder and having it create a macro for you.

**Play** After creating a macro, repeat the task you recorded by playing the macro.

## Macro ▶ ScriptMaker...

Use the ScriptMaker dialog box to copy, name, and edit macros.

## **Macros you can choose.**

For example:

### **Macro ▶ Comment block**

A built-in macro that inserts a comment code block at the cursor insertion point in the Source window.

### **Macro ▶ Save/close source windows**

A built-in macro that saves the contents of open Source windows and then closes them.

**Macro ▶ Comment block**

A built-in macro that inserts a comment code block at the cursor insertion point in the Source window.



**Macro ▶ Save/close source windows**

A built-in macro that saves the contents of open Source windows and then closes them.

## JAR Viewer...

Look at the contents of a JAR file.

## **Environment Options...**

Opens the Environment Options dialog box so that you can customize your Visual Cafe development environment. The options are global and apply to all projects.

## Window menu

```
{button Concepts,AL('Workspace_customization_overview;Visual_Cafe_Tools_overview;Debugging Your Program',0,'')}  
{button How To,AL('Workspaces_AUD_howto',0,'')} {button See  
Also,AL('Menus_F1;Class_Browser_using_F1;Hierarchy_Editor_F1;Property_Inspector_using_F1;Object_Library_F1;F1_Break  
points_Window;F1_Call_Stack_Window;F1_Messages_Window;F1_Thread_Window;F1_Variables_Window;F1_Watch_Window'  
,0,'')}
```

The following options are available from the Visual Cafe Window menu:

### **New Window**

Creates a new instance of the active Source window. Each new instance of the same window is incremented to indicate the number of open windows.

### **Docking View**

Toggles whether a dockable window can be docked. (MDI development environment)

### **Workspaces...**

#### ***workspace names***

Selecting a workspace from the list saves your current workspace and configures your environment to the new layout.

<b>New...</b>	allows you to create a new workspace.
<b>Rename...</b>	allows you to rename a workspace.
<b>Delete</b>	allows you to delete a workspace.

### **Next or Previous**

Activates the next or previous window in the workspace area. (MDI development environment)

### **Cascade, Tile Horizontally, Tile Vertically**

Arranges the windows in the workspace area in a cascaded or tiled orientation. (MDI development environment)

### **Windows...**

Displays a list of recently used windows.

## **New Window**

Creates a new instance of the active source window. Each new instance of the same window is incremented to indicate the number of open windows.

## **Docking View**

Toggles whether a dockable window can be docked. (MDI development environment)

## **Next or Previous**

Activate the next or previous window in the workspace area. (MDI development environment)

## **Cascade, Tile Horizontally, or Tile Vertically**

Arrange the windows in the workspace area in a cascaded or tiled orientation. (MDI development environment)



## Workspaces...

### ***workspace names***

Selecting a workspace from the list saves your current workspace and configures your environment to the new layout.

<b>Edit</b>	refers to the development workspace.
<b>Debug</b>	refers to the debug workspace.
<b>New...</b>	allows you to create a new workspace.
<b>Rename...</b>	allows you to rename a workspace.
<b>Delete</b>	allows you to delete a workspace.

## **Recently Used Windows**

To display one of the windows that you used recently, you can select the window name from the numbered list on the menu.

**Windows...**

Displays a list of recently used windows.

## Object menu

{button See Also,AL('Menus\_F1;Source\_Window\_F1;Using\_the\_Interaction\_Wizard\_F1;Add\_to\_Library\_dialog\_F1',0,',')}

The Object menu enables when the active window is the Project window or Form Designer. The following options are available from the Visual Cafe Window Object menu:

### **Edit *object*...**

Opens the selected item in its corresponding editor. This command is enabled only when the selected object is a form or visual object. The menu name changes to reflect the type of object selected.

### **Edit Source...**

Opens the Source window for the selected object. Allows you to view the code associated with an object.

### **Add Interaction...**

Opens the Interaction Wizard where you can create an interaction for objects in your project. This command uses the selected object as the trigger component.

### **Add to Library...**

Opens the Add to Library dialog box, where you can save the selected object in the Component Library.

**Edit *object*...**

Opens the selected item in its corresponding editor. This command is enabled only when the selected object is a form or visual object. The menu name changes to reflect the type of object selected.

## **Edit Source or Open**

Opens the Source window for the selected object or file. Allows you to view the code associated with an object or file.

## **Add Interaction...**

Opens the Interaction Wizard where you can create an interaction for objects in your project. This command uses the selected object as the trigger component.

## **Add to Library...**

Opens the Add to Library dialog box, where you can save the selected object in the Component Library.





## Layout menu

{button See Also,AL('Menus\_F1',0,',';')}

The following options are available from the Visual Cafe Window Layout menu. Alignment commands are available only when you do not specify a Layout manager for the form.

### **Align ▶ Right/Left/Bottom/Top Edges**

Aligns the selected objects relative to the specified edge. You can use the Form Designer's pop-up menu to align object to the left and top edges.

### **Align ▶ To Grid**

Aligns the upper left corner of the selected object(s) to the nearest grid point.

### **Center ▶ Vertically/Horizontally**

Centers the selected object in the form vertically or horizontally. If multiple objects are selected, the relative position of the objects to each other is maintained.

### **Space Evenly ▶ Vertically/Horizontally**

Spaces the selected objects evenly on a vertical or horizontal axis.

### **Make Same Size ▶ Vertical/Horizontal/Both**

Resizes the selected objects' vertical and/or horizontal dimensions based on the first selected object.

### **Bring to Front**

Brings the selected object to the front of other objects on the form.

### **Send to Back**

Puts the selected object behind other objects on the form.

### **Grid Options...**

Opens the Grid Options dialog box, where you can change the display, size of the Form Designer grid, and select or clear "snap to grid" and "show grid."

### **Invisibles**

Toggles the display of invisible components on a form. The default state for invisible objects is visible.

## **Align ▶ Right/Left/Bottom/Top Edges**

Aligns the selected objects relative to the specified edge. You can use the Form Designer's pop-up menu to align object to the left and top edges.

**Align ▶ To Grid**

Aligns the upper left corner of the selected object(s) to the nearest grid point.

## **Center ▶ Vertically/Horizontally**

Centers the selected object in the form vertically or horizontally. If multiple objects are selected, the relative position of the objects to each other is maintained.

## **Space Evenly ▶ Vertically/Horizontally**

Spaces the selected objects evenly on a vertical or horizontal axis.

## **Make Same Size ▶ Vertical/Horizontal/Both**

Resizes the selected objects' vertical and/or horizontal dimensions based on the first selected object.

## **Bring to Front**

Brings the selected object to the front of other objects on the form.

## **Send to Back**

Puts the selected object behind other objects on the form.



## **Grid Options...**

Opens the Grid Options dialog box, where you can change the display, size of the Form Designer grid, and select or clear "snap to grid" and "show grid."

## **Invisibles**

Toggles the display of invisible components on a form. The default state for invisible objects is visible.

## Search menu

```
{button See  
Also,AL(^Menus_F1;Find_dialog_F1;Find_in_Files_dialog_F1;Compare_Files_Dialog_F1;Members_window_F1;Setting_a_Cond  
itional_Breakpoint;Goto_Line_Window_F1;Goto_Function_F1;Bookmark_window_F1',0,','')}
```

The following options are available from the Visual Cafe Window Search menu. These commands are useful when trying to find a string in multiple files, comparing files, and editing code in the Source window and Class Browser edit pane.

### **Find...**

Opens the Find dialog box, where you can enter search criteria for the file in the active editing window.

### **Find Again**

Finds the next occurrence of the text string previously defined with the Find command.

### **Replace...**

Opens the Replace dialog box, where you can specify a search string and replacement text for the file in the active editing window.

### **Find in Files...**

Opens the Find in Files dialog box, where you can search for text across multiple files. The scope of the file search can be defined.

### **Bookmarks...**

Opens the Bookmark dialog box, where you can add, remove, or go to a bookmark. You can set and move to as many as ten different locations in your source files. Bookmarks are saved through the current Visual Cafe session only.

### **Go to Buffer...**

Opens the Go to Buffer dialog box, where you can change the options for the current edit buffer or those of another.

### **Go to Line...**

Opens the Go to Line window where you can specify a line number to move to. The Source pane is scrolled to the requested line. If any text is currently selected, the selection is extended to include that line.

### **Go to Function...**

Opens the Go to Function window so that you can select an available function from the list. The edit window's focus is moved to the selected function location.

### **Go to Definition...**

Opens the selected method or data member in the Class Browser. The associated code block displays in the editing pane. If there are multiple occurrences of the selection in the source file, then the Members window displays for a selection.

### **Go to Matching Delimiter...**

Finds the delimiter that matches the delimiter to the right of the current insertion point. The insertion point is moved to the front of the matching delimiter. This command can find matching parentheses, square brackets, or braces.

### **Go to Current Error**

### **Go to First Error**

### **Go to Previous Error**

### **Go to Next Error**

The Go to error commands moves the editing window focus to the location of the corresponding error.

**Find...**

Opens the Find dialog box, where you can enter search criteria for the file in the active editing window.

## **Find Again**

Finds the next occurrence of the text string previously defined with the Find command.

## **Replace...**

Opens the Replace dialog box, where you can specify a search string and replacement text for the file in the active editing window.

## **Find in Files...**

Opens the Find in Files dialog box, where you can search for text across multiple files. The scope of the file search can be defined.

## **Bookmarks...**

Opens the Bookmark dialog box, where you can add, remove, or go to a bookmark. You can set and move to as many as ten different locations in your source files. Bookmarks are saved through the current Visual Cafe session only.



## **Go to Buffer...**

Opens the Go to Buffer dialog box, where you can change the options for the current edit buffer or those of another.

## **Go to Line...**

Opens the Go to Line window where you can specify a line number to move to. The Source pane is scrolled to the requested line. If any text is currently selected, the selection is extended to include that line.

## **Go to Function...**

Opens the Go to Function window so that you can select an available function from the list. The edit window's focus is moved to the selected function location.

## **Go to Definition...**

Opens the selected method or data member in the Class Browser. The associated code block displays in the editing pane. If there are multiple occurrences of the selection in the source file, then the Members window displays for a selection.

## **Go to Matching Delimiter...**

Finds the delimiter that matches the delimiter to the right of the current insertion point. The insertion point is moved to the front of the matching delimiter. This command can find matching parentheses, square brackets, or braces.

**Go to Current Error**  
**Go to First Error**  
**Go to Previous Error**  
**Go to Next Error**

The Go to error commands moves the editing window focus to the location of the corresponding error.

## Source menu

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL('Menus_F1;F1_Watch_Window;Setting_a_Conditional_Breakpoint;Goto_Line_Window_F1;Bookmark_window_F1;Form  
at_Options_Dialog_F1',0,','')}
```

The following options are enabled when the Source window is the current window. These commands affect the debug setting or cursor placement in the Source window.

### **Evaluate Expression**

Lets you evaluate variables and expressions from a dialog box, modify their values, and add an entry to the Watch window.

### **Set Breakpoint**

Sets or clears a breakpoint on the current line. The toggling is based on whether or not a breakpoint is set for the current line of source code.

If no breakpoint is set, a breakpoint is set on the current line and a stop icon appears in the left margin next to the current line. If there is a breakpoint on the current line, the breakpoint is removed.

### **Set Conditional Breakpoint**

Opens the Conditional Breakpoint dialog box, where you can set a breakpoint that occurs if a particular expression evaluates to true.

### **Indent/Unindent**

Indents or unindents the selected text block.

### **Uppercase/Lowercase**

Converts the selected text to upper or lower case.

### **Tabs to Spaces**

Changes all tab characters in the selected text to spaces. The number of spaces used to replace each tab character depends on the current edit buffer's Tab Width value in the Format Options dialog box.

### **Spaces to Tabs**

Changes spaces in the selected text to tab characters. The number of spaces used to create each tab character depends on the current edit buffer's Tab Width value in the Format Options dialog box.

### **Format Options...**

Opens the Format Options dialog box, where you can set editing options for the current edit buffers.

## Evaluate Expression

Lets you evaluate variables and expressions from a dialog box, modify their values, and add an entry to the Watch window.



## **Add Watch**

Adds an entry to the Watch window for the selected variable.

## **Set Breakpoint**

Sets or clears a breakpoint on the current line. The toggling is based on whether or not a breakpoint is set for the current line of source code.

If no breakpoint is set, a breakpoint is set on the current line and a stop icon appears in the left margin next to the current line. If there is a breakpoint on the current line, the breakpoint is removed.

## **Set Conditional Breakpoint**

Opens the Conditional Breakpoint dialog box, where you can set a breakpoint that occurs if a particular expression evaluates to true.

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Indents or unindents the selected text block.

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Converts the selected text to upper or lower case.

## **Tabs to Spaces**

Changes all tab characters in the selected text to spaces. The number of spaces used to replace each tab character depends on the current edit buffer's Tab Width value in the Format Options dialog box.

## **Spaces to Tabs**

Changes spaces in the selected text to tab characters. The number of spaces used to create each tab character depends on the current edit buffer's Tab Width value in the Format Options dialog box.

## **Format Options...**

Opens the Format Options dialog box, where you can set editing options for the current edit buffers.



## Debug menu

```
{button Concepts,AL('Debugging Your Program',0,','')} {button See  
Also,AL('Menus_F1;Running_a_Project_howto;Stepping_Code_After_a_Breakpoint;Running_to_the_Cursor_Location;Running_  
to_Program_End;Project_Options_dialog_F1',0,','')}
```

The following options are available from the Visual Cafe Window Debug menu. The Debug menu replaces the Project menu when you start debugging.

### **Continue**

Runs a paused program.

### **Pause**

Temporarily stops the execution of a program while it is running and switches to debug mode. To begin the program again at the current location, choose Continue.

When an unhandled exception is encountered, Visual Cafe pauses automatically at the line where the error occurred.

### **Stop**

Terminates the program execution.

### **Restart**

Restarts the program. Debugging is restarted from the first line.

### **Step Into**

Steps into the next line of source code. This command steps to the next source code statement even if it is contained within a method.

### **Step Over**

Steps over the current method and stops when the method returns. Executes the program to the next statement, unless a breakpoint or exception is encountered before the next statement. If the current statement contains a method call, the entire method is called before control is returned.

### **Step Out**

Executes the current method until it returns to its caller, unless a breakpoint or exception is encountered before execution reaches that point.

### **Continue to Cursor**

Continues running a paused program while ignoring any breakpoints prior to the cursor location, then stops at the cursor location. When the cursor is reached, the program pauses and the debugger is invoked. If the selected line does not get executed before the end of the program, the program does not break.

### **Continue to End**

Continues running a paused program, ignoring all breakpoints, from the pause point until the normal termination point. If any type of exception occurs, the program breaks at the point where the exception is called.

### **Options...**

Opens the Project Options dialog box, where you can set debugging options under the Debugger tab.

### **Update Now**

Forces an incremental update and saves all files. (Professional edition only)

### **Restart Method**

Acts like a "Pop" command. It takes you back to the method that called the currently active method. You should not think of it like an undo command, because it cannot undo some edits, such as variable edits. It does not undo side effects of code that was run; an example could be if part of a program runs two times and causes an exit. (Professional edition only)

## **Continue**

Runs a paused program.

## **Pause**

Temporarily stops the execution of a program while it is running and switches to debug mode. To begin the program again at the current location, choose Continue.

When an un-handled exception is encountered, Visual Cafe pauses automatically at the line where the error occurred.

## **Stop**

Terminates the program execution.

## **Restart**

Restarts the program. Debugging is restarted from the first line.

## **Step Into**

Steps into the next line of source code. This command steps to the next source code statement even if it is contained within a method.

## **Step Over**

Steps over the current method and stops when the method returns. Executes the program to the next statement, unless a breakpoint or exception is encountered before the next statement. If the current statement contains a method call, the entire method is called before control is returned.

## **Step Out**

Executes the current method until it returns to its caller, unless a breakpoint or exception is encountered before execution reaches that point.



## **Continue to Cursor**

Continues running a paused program while ignoring any breakpoints prior to the cursor location, then stops at the cursor location. When the cursor is reached, the program pauses and the debugger is invoked. If the selected line does not get executed before the end of the program, the program does not break.

## **Continue to End**

Continues running a paused program, ignoring all breakpoints, from the pause point until the normal termination point. If any type of exception occurs, the program breaks at the point where the exception is called.

## **Update Now**

Forces an incremental update and saves all files. (Professional edition only)

## **Restart Method**

Acts like a “Pop” command. It takes you back to the method that called the currently active method. You should not think of it like an undo command, because it cannot undo some edits, such as variable edits. It does not undo side effects of code that was run; an example could be if part of a program runs two times and causes an exit. (Professional edition only)



## Variables menu

```
{button Concepts,AL('Debugging Your Program',0,','')} {button See  
Also,AL('Menus_F1;Projects_overview;Goto_Line_Window_F1;Bookmark_window_F1',0,','')}
```

The following option is available from the Visual Cafe Window Variables menu.

### **Add Watch**

Takes the selected item in the source window, or current token is there is no selection and adds an entry to the Watch window.



## Breakpoint menu

```
{button See Also,AL('Menus_F1;Projects_overview',0,'','')}
```

The breakpoint menu is available when your applet or application is running. These commands are also available from the Breakpoint Window's pop-up menu.

### **Clear/Clear all**

Clears the selected breakpoint or all breakpoints.

### **Enable/Enable all**

Enables the selected breakpoints or all breakpoints.

### **Disable/Disable all**

Disables the selected breakpoints or all breakpoints.

### **Go to Source**

Opens the Source window with focus on the line of code where the breakpoint is set.

**Clear/Clear all**

Clears the selected breakpoint or all breakpoints.

**Enable/Enable all**

Enables the selected breakpoints or all breakpoints.



**Disable/Disable all**

Disables the selected breakpoints or all breakpoints.

## **Go to Source**

Opens the Source window with focus on the line of code where the breakpoint is set.



## Threads menu

{button See Also,AL('Menus\_F1;Projects\_overview',0,'','')}

The following options are available from the Visual Cafe Window Threads menu.

### **Suspend**

Suspend the execution of the selected thread.

### **Resume**

Resumes execution of the selected thread from the previous suspend point.

### **Suspend others**

Suspends all other threads in the debugger except for the selected thread.

### **Resume others**

Resumes all other threads in the debugger except for the currently selected thread.

### **Set Focus**

Sets the focus of the debugger to the selected thread. The Call Stack, Variables, and Source windows are updated.

## **Suspend thread**

Suspend the execution of the selected thread.

**Resume thread**

Resumes execution of the selected thread from the previous suspend point.

## **Suspend other threads**

Suspends all other threads in the debugger except for the selected thread.

## **Resume other threads**

Resumes all other threads in the debugger except for the currently selected thread.

## **Set Focus**

Sets the focus of the debugger to the selected thread. The Call Stack, Variables, and Source windows are updated.





## Calls menu

```
{button See Also,AL('Menus_F1;Projects_overview',0,'','')}
```

The following options are available from the Visual Cafe Window Call menu.

### **View parameter values**

Toggles the display of parameter values in the Method column of the Calls window.

### **View parameter types**

Toggles the display of parameter types in the Method column.

### **Go to source...**

Opens the Source window for the selected call.

### **Go to Variables...**

Updates and displays the Variables Window with a list of variables in the selected method call.

### **Set Focus**

Set the focus of the debugger to the selected method call. This option also updates the Variables to show the active variables in the method and Source windows to show the method call so that you can step in if you want.

## **View parameter values**

Toggles the display of parameter values in the Method column of the Calls window.

## **View parameter types**

Toggles the display of parameter types in the Method column.

**Go to source...**

Opens the Source window for the selected call.

## **Go to Variables...**

Updates and displays the Variables Window with a list of variables in the selected method call.

## **Set Focus**

Set the focus of the debugger to the selected method call. This option also updates the Variables to show the active variables in the method and Source windows to show the method call so that you can step in if you want.



## Hierarchy menu

```
{button Concepts,AL('Hierarchy_Editor_F1',0,'')} {button How To,AL('Deleting_a_Class_Inheritance_howto',0,'')} {button  
See Also,AL('Insert_class_dialog_F1',0,'')}
```

The following commands are available on the Hierarchy menu. Use the Hierarchy Editor's pop-up menu to delete a class's inheritance.

### **Edit Class**

Opens the Edit Class Wizard, where you can change the definition of a class or interface.

### **Go to Source**

Opens the Source window containing the code for the selected package or class.

### **View Imports**

In addition to the local classes, the Hierarchy Editor displays the classes that are imported into the project.

## **Edit Class**

Opens the Edit Class Wizard, where you can change the definition of a class or interface.



## **Go to Source**

Opens the Source window containing the code for the selected package or class.

## **View Imports**

In addition to the local classes, the Hierarchy Editor displays the classes that are imported into the project.

## Classes menu

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL('Class_Browser_using_F1;Menus_F1;Insert_class_dialog_F1;Insert_class_dialog_F1;WinStyle_Controlling_Class_and  
_Member_Display_F1;WinStyle_Grouping_and_Sorting_Class_and_Members_F1',0,','')}
```

The following options are available from the Visual Cafe Classes menu. This menu is available when the Class Browser is active. Use the Insert menu or pop-up menus in the Class Browser panes to add new classes and members.

### **Edit Class...**

Opens the Edit Class Wizard, where you can change the definition of a class or interface.

### **Member Attribute...**

Opens the Member Attributes dialog box, where you can change the member's [access type](#) for the selected method or data element.

### **Delete Member**

Deletes the selected member from its class. If the selected member is a variable, like "Button1", this command removes the associated visual object.

### **Go to Source**

Opens the class' Java file in the Source window.

### **Options...**

Opens the Class Options dialog box, where you can expand or refine the elements in the class listing and define how classes or members are sorted.

**Edit Class...**

Opens the Edit Class Wizard, where you can change the definition of a class or interface.

## Member Attribute...

Opens the Member Attributes dialog box, where you can change the member's [access type](#) for the selected method or data element.

## **Delete Member**

Deletes the selected member from its class. If the selected member is a variable, like "Button1", this command removes the associated visual object.

## **Go to Source**

Opens the class' Java file in the Source window.

## **Options...**

Opens the Class Options dialog box, where you can expand or refine the elements in the class listing and define how classes or members are sorted.



## Popup Menu

## Using the Form Designer pop-up menu

```
{button See  
Also,AL(^Menus_F1;Forms_adding_objects;Arranging_Components_on_a_Form_howto;Connecting_Form_components_howto;  
Source_Window_F1;Using_the_Interaction_Wizard_F1;Add_to_Library_dialog_F1';0;''')}
```

When you right mouse click a component in the Form Designer, Visual Cafe displays this menu:

### **Cut/Copy/Paste**

These commands perform standard Windows functions.

### **Align Left Edges**

### **Align Top Edges**

### **Align to Grid**

Aligns the selected object(s) as indicated. Use the Form Designer's pop-up menu to align object to their relative right and bottom edges. See the Layout menu topic for information about aligning to a grid.

These commands are disabled if the selected controls reside inside a container that is using a [layout](#).

### **Edit Source**

Opens the Source window for the component.

### **Add Interaction**

Opens the Interaction Wizard. The selected component is used as the interaction's trigger component.

### **Add to Library...**

Opens the Add to Library dialog box, where you can add the selected component to the Component Library making it reusable across projects.

### **Properties**

Opens the Property List for the selected object.

## **Cut/Copy/Paste**

These commands perform standard Windows functions.

## **Edit Source or Open**

Opens the Source window for the component.

## **Add Interaction**

Opens the Interaction Wizard. The selected component is used as the interaction's trigger component.

## **Add to Library...**

Opens the Add to Library dialog box, where you can add the selected component to the Component Library making it reusable across projects.

## **Properties**

Opens the Property List for the selected object.

## Using the Objects view pop-up menu

```
{button Concepts,AL('Projects_overview',0,',';')} {button See  
Also,AL('Adding_objects_to_project_howtoMenus_F1;Add_Remove_Files_Dialog_F1;Connecting_Form_components_howto',0,  
';')} }
```

When you right mouse click an object in the Project window, Visual Cafe displays a pop-up menu with the following commands:

### **Go to Definition**

Opens the selected component's parent class in the Class Browser and shows the object declaration in the source pane.

### **Insert *object*...**

This Insert command reflects the selected object. This is a quick way of creating a new object of the selected type.

### **Insert Component...**

Opens the Insert Component dialog box, where you can select a component from the Component Library for insertion into the current project.

### **Edit *object***

This edit command reflects the selected object. The appropriate editor is opened for the selection.

### **Edit Source**

Opens the selected object's source code in the Source window.

### **Add Interaction**

Starts the Interaction Wizard so that you can define an interaction relationship between components. The selected object is the trigger component for the new interaction.

### **Properties**

Opens the Property List for the selected object.

### **Docking View**

Enable or disable docking of the window. (MDI development environment)

### **Hide or Close**

Hide or close the window.



## **Go to Definition**

Opens the selected component's parent class in the Class Browser and shows the object declaration in the source pane.

## **Insert *object*...**

This Insert command reflects the selected object. This is a quick way of creating a new object of the selected type.



## Using the Packages view pop-up menu

```
{button Concepts,AL('Projects_overview;Source_Window_F1',0,'')} {button See  
Also,AL('Menus_F1;Add_Remove_Files_Dialog_F1',0,'')}
```

When you right mouse click an object in the Project window, Visual Cafe displays a pop-up menu with the following commands:

### **Insert/Remove Files...**

Opens the Project Files dialog box, where you can add and remove files to and from the current project.

### **Edit Source or Open**

Opens the selected source file in the Source window.

### **Docking View**

Enable or disable docking of the window. (MDI development environment)

### **Hide or Close**

Hide or close the window.

## Using the Files view pop-up menu

```
{button Concepts,AL('Projects_overview;Source_Window_F1',0,'')} {button See  
Also,AL('Menus_F1;Add_Remove_Files_Dialog_F1',0,'')}
```

When you right mouse click an object in the Project window, Visual Cafe displays a pop-up menu with the following commands:

### **Compile**

Compiles and runs the current project with no debugging. Applets are run in the Symantec Applet viewer by default. You set the default viewer in the Project tab of the Project Options dialog box.

### **Parse**

Parses the selected file.

### **Insert/Remove Files...**

Opens the Project Files dialog box, where you can add and remove files to and from the current project.

### **Stop or Start RAD**

Disable or enable RAD for a file. The RAD feature makes objects appear in the Objects view, lets you design forms in the Form Designer, lets you design menus in the Menu Designer, lets you create interactions with the Interaction Wizard, and generates code according to your form design.

### **Edit Source or Open**

Opens the selected source file in the Source window.

### **Docking View**

Enable or disable docking of the window. (MDI development environment)

### **Hide or Close**

Hide or close the window.

**Insert/Remove Files...**

Opens the Project Files dialog box, where you can add and remove files to and from the current project.

## Hide or Close

Hide or close the window.

## **Stop or Start RAD**

Disable or enable RAD for a file. The RAD feature makes objects appear in the Objects view, lets you design forms in the Form Designer, and generates code according to your form design.



## Using the Project tabs pop-up menu

```
{button Concepts,AL('Projects_overview;Source_Window_F1',0,'')} {button See  
Also,AL('Menus_F1;Add_Remove_Files_Dialog_F1',0,'')}
```

When you right mouse click a tab in the Project window, Visual Cafe displays a pop-up menu with the following commands:

### **Objects**

Enable or disable the display of the Objects tab.

### **Packages**

Enable or disable the display of the Packages tab.

### **Files**

Enable or disable the display of the Packages tab.

### **Make *Tab* Default**

Enable or disable the tab as your default tab when a project first displays.



## **Objects**

Enable or disable the display of the Objects tab.

## **Packages**

Enable or disable the display of the Packages tab.

## **Files**

Enable or disable the display of the Packages tab.

## **Make *Tab* Default**

Enable or disable the tab as your default tab when a project first displays.



## Using the Class Pane pop-up menu

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL('Class_Browser_using_F1;Menus_F1;Insert_class_dialog_F1;Insert_class_dialog_F1;WinStyle_Controlling_Class_and  
_Member_Display_F1;WinStyle_Grouping_and_Sorting_Class_and_Members_F1',0,','')}
```

When you right mouse click an object in the Class Browser's Classes pane, Visual Cafe displays a pop-up menu with these commands:

### **Insert Class...**

Opens the Insert Class Wizard, where you can add and define a new class or interface for the project.

### **Edit Class...**

Opens the Edit Class Wizard, where you can change the definition of a class or interface.

### **Go to Source**

Opens the selected class Java source file in the Source window.

### **Options...**

Opens the Class Options dialog box, where you can expand or refine the elements in the class listing, and define how classes or members are sorted.

## **Insert Class...**

Opens the Insert Class Wizard, where you can add and define a new class or interface for the project.

## **Options...**

Opens the Class Options dialog box, where you can expand or refine the elements in the class listing, and define how classes or members are sorted.

## Using the Member Pane pop-up menu

```
{button Concepts,AL('Class_Browser_using_F1',0,'')} {button How To,AL('Adding_methods_ClassBrowser_howto',0,'')}  
{button See  
Also,AL('Menus_F1;Member_Attributes_dialog_F1;Insert_Member_dialog_F1;WinStyle_Controlling_Class_and_Member_Displa  
y_F1;WinStyle_Grouping_and_Sorting_Class_and_Members_F1',0,'')}
```

When you right mouse click an object in the Class Browser's Member pane, Visual Cafe displays a pop-up menu with these commands:

### **Insert Member...**

Opens the Insert Member dialog box, where you can add a new method or variable to the selected class.

### **Delete Member**

Deletes the selected method or data member. The member's declaration is removed from the source files.

### **Member Attributes...**

Opens the Member Attributes dialog box, where you can change a member's access type.

### **Go to Source**

Opens the Source window with focus on the selected member.

### **Options...**

Opens the Class Options dialog box, where you can expand or refine the elements in the member listing, and define how members and classes are sorted and grouped.



## **Insert Member...**

Opens the Insert Member dialog box, where you can add a new method or variable to the selected class.

## **Delete Member**

Deletes the selected method or data member. The member's declaration is removed from the source files.

**Member Attributes...**

Opens the Member Attributes dialog box, where you can change a member's access type.

## **Go to Source**

Opens the Source window with focus on the selected member.

## **Options...**

Opens the Class Options dialog box, where you can expand or refine the elements in the member listing, and define how members and classes are sorted and grouped.

## Using the Hierarchy Editor pop-up menu

```
{button See Also,AL(^Menus_F1;Hierarchy_Editor_F1;Insert_class_dialog_F1',0,',')}
```

When you right mouse click an object in the Project window, Visual Cafe displays a pop-up menu with these commands:

### **Insert Class...**

Opens the Insert Class Wizard, where you can add and define a new class or interface for the project.

### **Edit Class...**

Opens the Edit Class Wizard, where you can change the definition of a class or interface.

### **Remove Inheritance**

This command is enabled when you select the line connecting two classes in the window.

The line represents a connection between two classes. When you delete the connection, the inheritance changes such that the object now extends `java.lang.Object`.

### **Go to Source**

Opens the Source window with focus on the selected package or class.

### **View Imports**

In addition to the local classes, the Hierarchy Editor displays the classes that are imported into the project.

## **Remove Inheritance**

This command is enabled when you select the line connecting two classes in the window.

The line represents a connection between two classes. When you delete the connection, the inheritance changes such that the object now extends `java.lang.Object`.



## Using the Component Library pop-up menu

```
{button See Also,AL('Menus_F1',0,'','')}
```

When you right mouse click an object in the Component Library, Visual Cafe displays a pop-up menu with these commands:

### **Insert Group**

Creates a new group item.

### **Add to Palette**

Adds the selected object(s) to the active Palette tab at the end of the object list.





## Using the Source Window pop-up menu

```
{button See Also,AL('Menus_F1;Source_Window_F1;Class_Browser_F1;Members_window_F1',0,'')}}
```

The following commands are available from the pop-up menu when editing source code in the Source window, as well as the Class Browser's editing pane.

### **Continue to Cursor**

Continues running a paused program until the programmer reaches the selected cursor position.

### **Cut/Copy/Paste**

These edit commands perform standard Windows functions.

### **Go to Definition**

Opens the selected method or data member in the Class Browser. The associated code block displays in the editing pane. If there are multiple occurrences of the selection in the source file, then the Members window displays for a selection.

### **Evaluate Expression**

Lets you evaluate variables and expressions from a dialog box, modify their values, and add an entry to the Watch window.

### **Set Breakpoint**

Sets a breakpoint at the current cursor location.

### **Format Options...**

Opens the Format Options dialog box, where you can set editing options for the current edit buffers.

## Toolbars



## Using Visual Cafe toolbars

```
{button How To,AL('Controlling_Position_and_Visibility_howto',0,'')} {button See  
Also,AL('Toolbars_standard_F1;Toolbars_layout_F1;Toolbars_views_F1;Toolbars_debug_F1;Visual_Cafe_window_F1',0,'')}
```

Visual Cafe provides an extensive set of toolbars. Toolbars can be docked in the Visual Cafe Window or floated on the screen.

These toolbars are available in the Visual Cafe window:

- Standard
- Layout
- Views
- Debug
- Workspace



## Using the Standard toolbar

```
{button How To,AL('Adding_a_new_file_to_the_project_howto',0,'')} {button See  
Also,AL('File_menu_F1;Applets_step_overview;Applications_step_overview',0,'')}
```

The Standard toolbar provides icons for tasks that you perform when using Visual Cafe. The icons execute standard Windows tasks.

From the standard toolbar, you can:

- create a new source file
- open an existing document
- save the active document
- cut/copy/paste
- print source code
- display information about Visual Cafe
- activate context sensitive help



## Using the Layout toolbar

```
{button See Also,AL('Form_Designer_F1;Layout_Menu_F1',0,'')}
```

The Layout toolbar provides quick access to the common commands that you use when using the Form Designer.

The icons on the Layout toolbar perform standard Windows graphic object layout tasks.

From the Form Designer, you can:

- Align objects by their left/right edges or top/bottom edges
- Center objects vertically or horizontally in the form
- Space objects vertically and horizontally
- Size objects equally vertically, horizontally, or both
- Show the grid on or off
- Show the display of [invisible objects](#)



## Using the Views toolbar

```
{button Concepts,AL('Debugging Your Program',0,','')} {button See  
Also,AL('Projects_overview;Property_Inspector_using_F1;Class_Browser_using_F1;Hierarchy_Editor_F1;Window_Menu_F1',0,`  
;')}
```

The Views toolbar gives you quick access to different views into your project and debugging tasks.

From the Views toolbar, you can access these windows:

- Class Browser
- Hierarchy Editor
- Property List
- Breakpoints
- Variables
- Watch
- Threads
- Call Stack
- Messages

### Tasks

[Watching a variable or expression](#)

[Setting a breakpoint](#)

[Debugging threads](#)

[Viewing the current variable values](#)

[Viewing the call stack](#)



## Using the Workspace toolbar

```
{button Concepts,AL('Workspace_customization_overview',0,'')}
```

The Workspace toolbar allows you to select an existing workspace.

By default, there are two workspaces defined. Your workspaces may display differently than defined below because the workspace's state is saved as you close Visual Cafe tools.

### **Edit**

Displays the Project window, Form Designer, and Property List windows.

### **Debug**

Displays the Project, Variables, Call Stack, and Breakpoints windows.



## Using the Debug toolbar

```
{button See Also,AL('Debugging Your Program',0,'')}}
```

The Debug toolbar provides easy access to the commands that you use most often when debugging your program.

### Tasks

[Running a program in the Debugger](#)

[Pausing a program](#)

[Stopping a program](#)

[Stepping into a method](#)

[Stepping over a method](#)

[Stepping out of a Method](#)

[Toggling a breakpoint](#)

[Watching a variable](#)



## Tools and Window

# Dialog Boxes



## Using the Add to Library dialog box

```
{button Concepts,AL('Object_Library_F1')}
```

### Object ► Add to Library

The Add to Library dialog box allows you to add objects to the Component Library.

1. Select the group that the object will belong to.
2. Enter a name for the object in the Name field and a Description string.  
The Description string is used when the object displays on the Palette or is listed in the Component Library window.
3. Click OK.



## Using the Insert/Remove Files dialog box

```
{button Concepts,AL('Projects_overview',0,'')} {button See  
Also,AL('Adding_Files_to_a_Project_howto;Adding_Bean_to_Library_howto;Projects_overview',0,'')}
```

### Project window, Packages tab ▶ Insert/Remove files

The Insert/Remove dialog box contains a list of files in the project. When a file is added, the file name is highlighted in the Project window.

#### To remove a file

1. Select the file to remove from the file pane at the bottom of the dialog box.
2. Click Remove or press the DELETE key.

#### To add a file

1. Locate and select the files to be added.
2. Click Add to add the selected files or click Add All to add all files in the current directory.

The file is added to the file pane at the bottom of the dialog box.



## Using the Create Project Template dialog box

{button Concepts,AL('Working\_with\_Templates\_overview',0,'')} {button See Also,AL('Creating\_a\_Project\_howto',0,'')}

### Project ► Create Project Template

The Create Project Template dialog box allows you to add a custom project templates to the Component Library.

#### Tasks

[Creating a template](#)

[Deleting Templates from the Component Library](#)

## Using the Conditional Breakpoint dialog box

```
{button Concepts,AL('Setting Breakpoints',0,'','')}
```

### Source ▶ Set Conditional Breakpoint

You can set [conditional breakpoints](#) in any source window or pane. Breakpoints are marked in the editing window by a red dot in the left margin.

1. Specify the condition under which the breakpoint will be evaluated.

Option	Description
Always break	Always stop program execution at this breakpoint.
If expression is true	Use this option when you want the debugger to evaluate the associated expression every time this breakpoint is hit. A breakpoint is considered to be hit only if the expression is evaluated to true. This allows you to insert a statement in your code that you forgot, or to first test (in the debugger) that a certain modification does fix the problem before editing and compiling again.

2. Specify the location of the breakpoint.

Option	Description
Method name	Name of the method that the breakpoint is set on.
Line number	The physical line number in the source code where the break should occur.

3. Click Ok.

The source editor determines if the breakpoint location is valid and then inserts the breakpoint.



## Using the Evaluate Expression dialog box

{button See Also,AL('Watching a Variable or Expression ;Watching Variables and Expressions',0,'','')}

### Source ▶ Evaluate Expression

Use this dialog box to evaluate variables and expressions, and add an entry to the Watch window.

1. If needed, type a variable or expression in the Expression field.
2. To get the value of a variable or expression, click Recalculate or press RETURN. To change a value, type the new value in the Result list. To add a variable or expression to the Watch window, and close the dialog box, click Add Watch.



## Using the Images dialog box

```
{button See Also,AL('SlideShow component;URL property;'0;'')}
```

### Property List ▶ URL property/ImageList property

Use this dialog box to enter a series of .gif and .jpg image files that are to be used with the associated component. The order of the images in this list is the order in which they display.

Reordering of the images can be done with the up and down arrows.





## Using the Insert Applet dialog box

{button Concepts,AL(`Applets\_step\_overview;Projects\_overview`)} {button See  
Also,AL(`Creating\_a\_Template\_howto;Deleting\_Objects\_from\_the\_Object\_Library\_howto`,0,`,`)}

### Insert ► Applet

The Insert Applet dialog box allows you to create the new applets from an existing [template](#) into an existing project.

The current default template is marked with an asterisk. If there are no templates in the default library, then a basic applet project is created.

To create an applet, select a template to be used as the applet base and click OK.

You can add applets to use as templates by adding an existing applet to the Project Template folder in the Component Library.

Standard view buttons are provided on the dialog box to change the display of the templates:



Shows the templates as large icons.



Shows the templates as small icons.



Shows the templates in a list.



Shows the templates in a single-column



## Using the Insert Form dialog box

{button See Also,AL('Form\_Designer\_F1',0,'','')}

### Insert ▶ Form

This dialog box lets you to create a new form from one of the templates in the Component Library.

1. Select a template for the new form.
2. Click OK.

The form is added to the project and opened for editing in the Form Designer.



## Using the Insert Member dialog box

```
{button See Also,AL('Class_Browser_using_F1;Member_Attributes_dialog_F1',0,','')}
```

### Insert ▶ Member

Use this window to add a new member to the selected class.

1. Specify the member declaration.

For data items, enter the type and member name (for example, int nCats). A trailing semicolon is optional. The member declaration is placed into the class declaration.

**Note** The Source File field is not editable. It displays the name of the source file into which the member definition will be placed.

2. Indicate the [base class access type](#).

This dialog box is also available with the Insert Member command on the Class Browser, Members pane pop-up menu.



## Using the Insert Object dialog box

{button Components,JI('VCAFE.HLP','Visual\_Components\_and\_Containers')}

### Insert ► Component

The Insert Object dialog box allows you to add appropriate objects directly from the Component Library. The object list is filtered based on the current selection when the dialog box is opened.

Objects are filtered based on the current selection. For example, if a form is selected in the Project window when you open the Insert Object dialog box, then only the components that are valid within a form display.

You can also access the Insert Object dialog box from the Project window by choosing Insert Component from the pop-up menu.

### Tasks

[Adding objects to a form](#)

[Adding objects to a project](#)

[Adding objects to the Palette](#)

## Using the New Project dialog box

```
{button Concepts,AL('Projects_overview')} {button See  
Also,AL('Creating_a_Template_howto;Popup_menu_New_Project__F1',0,'')}
```

### File ► New Project

The New Project dialog allows you to create a new object from an existing [template](#).

The current default template is marked with an asterisk. If there are no templates in the default library, then a basic applet project is created.

Standard view buttons are provided on the dialog box to change the display of the templates:



Shows the templates as large icons.



Shows the templates as small icons.



Shows the templates in a list.



Shows the templates in a single-column

### Tasks

[Creating a new project](#)

[Defining a new default template](#)

[Removing templates from the Component Library](#)



## Using the Open File dialog box

{button How To,AL('Adding\_Files\_to\_a\_Project\_howto',0,'')} {button See Also,AL('Source\_Window\_F1',0,'')}

### File ▶ Open

The Open File dialog box allows you to open Visual Cafe project file.

When you select a Visual Cafe project file (**.vep**), the project opens using the last saved window configuration.

When you select a Java source file (**.java**) or HTML file (**.html**), the Source window opens for source code editing.

**Note** When you open a file, Visual Cafe does not automatically add the file to the current project.



## Using the Members window

```
{button See Also,AL('Source_Window_F1;Search_Menu_F1;Class_Browser_using_F1',0,'')}
```

### Search ► Go to Definition

This window displays as a result of a successful search with the Go to Definition command.

1. In the Source window, select the definition that you want to search for within the file.  
For example, you can highlight the `init` keyword.
2. Choose Search ► Go to Definition.  
The Members window lists all class methods in the source file that have the selected definition.
3. Double-click the appropriate method to open the Class Browser for the selected member's class.  
The selected method source code displays in the Class Browser editing pane.

## ▶ Using the ScriptMaker dialog box

Use the ScriptMaker dialog box to copy and rename macros.

Use the File ▶ Macro

▶ Record macro command to record your editing keystrokes. The file is saved as the <DEFAULT> macro. You can then use this dialog box to duplicate the macro and name the duplicate for saving. You cannot rename the default script; you must duplicate it first. If DEFAULT.MAC is deleted from disk, Visual Cafe Basic creates a stub file when it starts up.

### **Macros**

Lists existing macros that are associated with the current project. ScriptMaker macro files have the extension .MAC and are stored in \Bin\Macs. The default macro is highlighted by default. Click a macro to select it. Double-click to open a macro in an editor.

### **Properties**

The display name and file name of the selected macro.

### **Display in Menu**

Select this option if you want the current (highlighted) macro to appear by name at the bottom of the File ▶ Macro menu.

### **Reorder Commands**

Allows you to change the order of the macros which appear in the Macro menu. Click the up arrow to move the selected macro up in the menu; click the down arrow to move it down in the menu. The default macro always stays at the top of the list.

### **Done Button**

Click Done to save all changes to the project's macros.

### **Edit Button**

Click Edit to open a macro in an editor.

### **Rename Button**

Click Rename to rename the current macro. The Rename/Duplicate Macro dialog box appears. Rename is not active when the default macro is highlighted.

### **Duplicate Button**

Click Duplicate to create a copy of the current macro. The Rename/Duplicate Macro dialog box appears.

### **Delete Button**

Click Delete to delete the current macro. Delete is not active when the default macro is highlighted.





## Using the URL Chooser dialog box

```
{button See Also,AL('URL_property;ImageUrl',0,'')}
```

### Property List ▶ URL property or ImageURL property

Use this dialog box to select a single .gif or .jpg image file to be used by the selected component. The image format must be compatible with the browser that will be running the component.



## Using the Windows dialog box

### Window ▶ Windows

Use this dialog box to select a recently access tool or project window. On this dialog box you can activate or close the selected window.

You can SHIFT-click multiple window names.

## Class Options Dialog box

## **F1 help for standard Win95 windows**

All of the help topics in this section use the direct helpid context string.



## **Using the Open File dialog box**

Use this dialog box to open the appropriate file for your current task.



## **Using the Save File dialog box**

Use this dialog box to save the active file or object.



## **Using the About Visual Cafe dialog box**

Provides information about your Visual Cafe release.

# Database Edition F1 Help

Author note: They couldn't figure out a way to get this to work from the database help file, so you have to put it here.



## dbNAVIGATOR

Display the dbNAVIGATOR window. After connecting to a dbANYWHERE Server, you can use the dbNAVIGATOR as an easy way to view a list of dbANYWHERE servers and [data sources](#) that are currently connected, and to add database functionality to a project.

## Add Table

Start the Add Table wizard, which helps you add a table to your project. If your project already has a [QueryNavigator](#) or [RelationViewPlus](#), you can create a [master/detail relationship](#). If you are using the [JDBC API](#), you can create [joins](#) across [forms](#). Before choosing this command, in the Project window, select the [container](#) that you want to add the table to.



## Using the dbNAVIGATOR pop-up menu

When you right-click in the dbNAVIGATOR window, a pop-up menu displays with the following commands:

### **Insert Server**

Opens the dbANYWHERE Server dialog box that lets you connect to a dbANYWHERE Server. This command is available only if a dbANYWHERE Server is selected.

### **Delete Server**

Deletes the selected dbANYWHERE Server from the dbNAVIGATOR. This command is available only if a dbANYWHERE Server is selected.

### **Connect**

Opens the Logon dialog box that lets you logon to a [data source](#). This command is available only if a Data Source is selected.

### **Disconnect**

Disconnects the selected database.

### **Refresh**

Refreshes the selected database's dbNAVIGATOR tables and columns information. This command is useful for multiple concurrent users. This command is available only if a dbANYWHERE Server or Data Source is selected.

Obsolete



## Using the Create Derived Class dialog box

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,'','')}
```

Class are added to a project a derived class.

1. Select a Base Class for the new class. The base class is the class from which the new class is derived.
2. Enter a name for the new class.

As you enter a class name, the Source File path is generated for you. The default path works best in most conditions.

End of F1 Edit file

## Component Date/History Tracking

1/16/97: Added dummy topics for Pro testing -- Date, Time, Timestamp.

2/1 - 3/3 - updated topics, added popups, removed jumps to API, remapped Event button

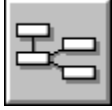
3/3/97 Sent for engineering review.

4/15/97 Remove DateMask, TimeMask, and DateTimeMask from index/browse string. Components were deleted from the release.

6/11/97 Modified RadioBox and RadioButton components, added DateTimeStamp Component

8/6/97 Update/check all components for 1.1

12/04/97 - Added JDBC components



## Visual Cafe components and containers

```
{button Component List,PI('vcafe.hlp','Components_standard_list_popup')}
```

Visual Cafe helps you to design Java applets and applications, without writing source code by using a library of pre-written components.

In Java, the objects you use to create a visual interface are called components. You place your components into objects called containers, which define a window and determine how each component displays in its window.

For example, a Frame is the parent container used to build a visual interface for an application. To build a Frame in Java, you extend a Frame class and instantiate and configure that subclassed object, and then instantiate, configure and add components, like Buttons or TextFields, into your Frame container. This is a complex process.

Visual Cafe simplifies this process. In Visual Cafe, you build an application project using the New Project window, drag component icons from the Palette to your Form Designer window, and configure the component using its Property List window. Visual Cafe does the rest for you.

**More information:** For more information about standard component classes, see the Java API Reference manual. For information about dbAWARE classes, such as Session, ConnectionInfo, and RelationViewPlus, see the dbANYWHERE API Reference manual. These manuals are available from the Visual Cafe Help menu.

### Visual Cafe DDE components

Visual Cafe *Database Developer Edition* provides two types of database components:

- connection components
- dbAWARE components

Connection components are invisible components that define the database connection, the database view, and how data is retrieved.

A dbAWARE component is a Visual Cafe component that has additional properties for binding to data in a database. dbAWARE components are bound to the current row in a single database column and some can be bound to another database column for component population. Some dbAWARE components provide [projection binding](#), others provide [list binding](#).

dbAWARE components extends classes in package `symantec.itools.db.awt`.

To define the data binding of a dbAWARE component, use a [RelationViewPlus component](#).

Several of the standard Visual Cafe components have an equivalent dbAWARE component.

**Tip:** You can quickly add dbAWARE components by using the dbAWARE Project Wizard (File ► New Project) and the Add Table Wizard (Insert

► Add Table Wizard, and the Add Table Wizard icon on the Component Palette.)

### Additional component information

To access reference information about an individual component, perform a search in the Help system index or select the component on the Component Palette or in the Component Library and press F1.

### Also see

[Understanding the Component class](#)

[Understanding the Container class](#)



## Components

Container objects are found in the Panel and Forms categories.

Components with dbAWARE properties are available with Visual Cafe *Database Developer Edition* only. Components that are both general and dbAWARE components are marked with a .

JDBC	dbAWARE	Additional	Multimedia	Standard	Panels
<a href="#">ConnectionManager</a>	<a href="#">Add Table Wizard</a>	▶ <a href="#">ComboBox</a>	<a href="#">Animator</a>	<a href="#">Button</a>	<a href="#">BorderPanel</a>
<a href="#">JdbcConnection</a>	▶ <a href="#">Checkbox</a>	<a href="#">DaySpinner</a>	<a href="#">Emblaze20</a>	<a href="#">Canvas</a>	<a href="#">ImagePanel</a>
<a href="#">Mediator</a>	▶ <a href="#">ComboBox</a>	<a href="#">DirectionButton</a>	<a href="#">Firework</a>	▶ <a href="#">Checkbox</a>	<a href="#">KeyPressManager</a>
<a href="#">MediatorDS</a>	<a href="#">ConnectInfo</a>	▶ <a href="#">FormattedTextField</a>	▶ <a href="#">ImageViewer</a>	<a href="#">Choice</a>	<a href="#">RadioButtonGroup</a>
<a href="#">QueryNavigator</a>	<a href="#">DateTimeStamp</a>	<a href="#">HorizontalSlider</a>	<a href="#">MovingAnimation</a>	<a href="#">Horizontal Scrollbar</a>	<a href="#">el</a>
<a href="#">RecordDefinition</a>	▶ <a href="#">FormattedTextField</a>	<a href="#">ImageButton</a>	▶ <a href="#">NervousText</a>	▶ <a href="#">Label</a>	<a href="#">el</a>
	<a href="#">Grid</a>	<a href="#">ImageHTMLLink</a>	<a href="#">Plasma</a>	▶ <a href="#">List</a>	<a href="#">ScrollingPanel</a>
	▶ <a href="#">ImageViewer</a>	<a href="#">ImageListBox</a>	<a href="#">SlideShow</a>	<a href="#">Panel</a>	<a href="#">SplitterPanel</a>
	▶ <a href="#">Label</a>	<a href="#">InvisibleButton</a>	<a href="#">SoundPlayer</a>	▶ <a href="#">RadioButton</a>	<a href="#">TabPanel</a>
	▶ <a href="#">List</a>	<a href="#">InvisibleHTMLLink</a>		▶ <a href="#">TextArea</a>	<a href="#">ToolBarPanel</a>
	▶ <a href="#">NervousText</a>	<a href="#">LabelButton</a>		▶ <a href="#">TextField</a>	<a href="#">ToolBarSpacer</a>
	<a href="#">RadioBox</a>	<a href="#">LabelHTMLLink</a>		<a href="#">Vertical Scrollbar</a>	
	▶ <a href="#">RadioButton</a>	<a href="#">Label3D</a>			
	<a href="#">RecordStateLabel</a>	<a href="#">ListSpinner</a>			
	<a href="#">RecordNumberLabel</a>	<a href="#">MonthSpinner</a>			
	<a href="#">RelationViewPlus</a>	<a href="#">MultiList</a>			
	<a href="#">Session</a>	<a href="#">NumericSpinner</a>			
	▶ <a href="#">StateCheckBox</a>	<a href="#">RollOverButton</a>			
	▶ <a href="#">TextArea</a>	<a href="#">ScrollingText</a>			
	▶ <a href="#">TextField</a>	▶ <a href="#">StateCheckBox</a>			
		<a href="#">StatusBar</a>			
		<a href="#">VerticalSlider</a>			
		<a href="#">WrappingLabel</a>			
<b>Forms</b>	<b>Menus &amp; Items</b>	<b>Shapes</b>	<b>Utility</b>	<b>Predefined TextFields</b>	
<a href="#">AboutDialog</a>	<a href="#">CheckboxMenuItem</a>	<a href="#">Circle</a>	<a href="#">Calendar</a>	<a href="#">IntLongDistPhoneNumber</a>	
<a href="#">Applet</a>	<a href="#">Menu</a>	<a href="#">Ellipse</a>	<a href="#">ProgressBar</a>	<a href="#">ber</a>	
<a href="#">AttentionDialog</a>	<a href="#">MenuBar</a>	<a href="#">HorizontalLine</a>	<a href="#">StatusScroller</a>	<a href="#">LocalPhoneNumber</a>	
<a href="#">Dialog</a>	<a href="#">MenuItem</a>	<a href="#">Line</a>	<a href="#">Timer</a>	<a href="#">LongZipCode</a>	
<a href="#">Frame</a>		<a href="#">Rect</a>	<a href="#">TreeView</a>	<a href="#">PostalCode</a>	
<a href="#">Open File Dialog</a>		<a href="#">Square</a>	<a href="#">Wizard</a>	<a href="#">SocialInsuranceNumber</a>	
<a href="#">PasswordDialog</a>		<a href="#">VerticalLine</a>		<a href="#">SocialSecurityNumber</a>	
<a href="#">ProgressDialog</a>				<a href="#">USLongDistPhoneNumber</a>	
<a href="#">Save File Dialog</a>				<a href="#">ber</a>	
<a href="#">Window</a>				<a href="#">ZipCode</a>	

## Understanding the component class

```
{button See Also.AL('Container_class;Visual_Cafe_components_and_containers',0,','')} {button API,Jl('APIRef.hp','java.awt.Component.html')}
```

The Component class is the parent [class](#) from which all visual [components](#) and [containers](#) extend. This class provides a protocol defining [objects](#) that will possess size and position, can be rendered onto the screen, and can respond to [events](#).

The visual components present on the Visual Cafe palette are subclasses of class [Components](#). The [Container](#) class is also a subclass of Component. Specialized containers for applets, pop-up windows, and applications are subclasses of class Container. Both Component and Container are abstract classes and cannot be instantiated without first subclassing them.

Use a component in one of three ways:

- You can write an entirely new component by subclassing the Component class directly. Be sure to override all abstract members.
- You can instantiate one of the standard visual components (like Button or WrappingLabel) directly. Your code can handle that component's events by registering a listener with it. See [events](#) for more information.
- You can subclass one of the standard visual components (like Button or WrappingLabel). Your subclassed component will inherit all public Component data members and [methods](#), and can directly access the members it needs. Your code can handle that component's events by registering a listener with it (preferred), or by using the old event "inheritance" model. See

[events](#) for more information.

By default, Visual Cafe provides an Applet component for creating [applets](#) and a [Frame component](#) for creating [applications](#).

## Understanding the container class

```
{button See Also.AL('Component_class;Visual_Cafe_components_and_containers',0,','')} {button  
API,JI('APIRef.hlp','java.awt.Container.html')}
```

A Container is a visual component that can hold other visual components. You build a Java GUI by placing components and containers into a parent Container extended from this class.

The Container class provides a calling protocol that defines objects that can display on the screen, show or hide themselves and their contents, receive or surrender focus, provide default responses to user [events](#) and hold objects of the type component.

Use a container in one of three ways:

- You can write an entirely new container by subclassing the Container class directly. Be sure to override all abstract members. The Window container typically provides this basic functionality.
- You can instantiate one of the standard Containers (like Frame or BorderLayout) directly. Your code can handle that container's events by registering a listener with it. See [events](#) for more information.
- You can subclass one of the standard Containers (like Frame or BorderLayout). Your subclassed container will inherit all public Container data members and [methods](#), and can directly access the members it needs. Your code can handle that container's events by registering a listener with it (preferred), or by using the old event "inheritance" model. See [events](#) for more information.

In Visual Cafe, applications are built on Frame containers and Applets are built on Applet containers. Double-clicking on one of these containers in the Project window opens a Form Designer window for visual editing of that container and its components. Other specialized containers are listed below:

<a href="#">Window</a>	A blank modal container that must be set into a Frame.
<a href="#">Frame</a>	A top-level window. Extends Window. It supports a title and menu bar, and can be minimized. It cannot be placed inside other containers.
<a href="#">Panel</a>	A basic organizational container. It can be placed inside other containers including other panels.
<a href="#">Applet</a>	A Panel that can be run by another program and supports multimedia features. Applet containers are parents to applet programs. Applets cannot be nested.

### Tips:

To build a GUI using Visual Cafe, create an [application](#) or an [applet](#) project using the Project window. Depending on what you selected, Visual Cafe automatically provides you with either a Frame container or an Applet container as the parent container for your project. Continue by dragging container and component icons from the Palette or Component Library to the Form Designer window as necessary.

To build a GUI in project source code, instantiate a Container object and all the Component objects you need. Call the container's [setLayout](#) method to add a [layout](#) manager, if desired. Then call that container's [Add](#) [method](#) to place Component objects into your Container object. Finally, call the container's [setVisible](#) method to make the container and all components visible.

## Standard components with dbAWARE properties

## Checkbox component (standard/dbAWARE)

```
{button Properties,PI('vcafe.hlp','Checkbox_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button Example,JI('vcafe.hlp','Example_CheckBox')} {button API (standard),JI('APIRef.hlp','java.awt.Checkbox.html')} {button API (dbAWARE),JI('APIRef.hlp','symantec.itools.db.awt.Checkbox.html')}
```

### Description

A labelled square box that the user toggles to turn on or off an option. To toggle, either click on the Checkbox's box or label, or press the spacebar when it has the focus.

Use a Checkbox to

- display a true/false value to the user and optionally allow it to be changed,
- display a possible range of options to the user and optionally allow one or more to be chosen.

If a Checkbox is a member of a group (by having a name is specified in the [Group property](#) field), it is a [RadioButton](#) and is used to select one of a possible range of options. See [RadioButton](#) for more information.

See also: [StateCheckBox](#)

See also: [RadioButton](#)

### dbAWARE features

A dbAWARE version of the Checkbox component is available in Visual Cafe *Database Developer Edition*.

This component automatically updates the database when certain triggering events occur. See [Events Triggering Database Updates](#) for more information.

One use for a dbAWARE checkbox is to link a check box and list box to the same column, and define True and False string values for the check box. Then, when your user selects the check box option the true value displays in the list box; when the check box is cleared, the false value displays.

Although [CheckBox](#) components change their appearance to become [RadioButton](#) components when they are added to a [RadioBoxGroupPanel](#) component, it is recommended that you use the appropriate component to begin with.

The [Data Binding property](#) is used to bind this component with a specific data item in the database.

The [Empty Means Null property](#) defines how a component with no value (empty) is saved in the database.

The [Triggering Event property](#) specifies which event makes the component commit its value to the database.

### Runtime modification

To add a [CheckBox](#) to a checkbox group at run time, call [setCheckboxGroup](#) to add the component to a particular group. If you are using a [RadioGroupButtonPanel](#), you can just add the component to the panel.

### Properties

To set the default state, either checked (true) or cleared (false), use the [State property](#).

Use the Interaction Wizard to have another component perform some action when the Checkbox value changes and generates an [ItemEvent](#) type event. Actions can be triggered when the Checkbox generates other standard events, too.

To group [CheckBox](#) components, use the [Group property](#) to specify a common group name. When the Group property is specified, the [CheckBox](#) behaves like a [RadioButton](#). Only one of the components in the [CheckBox](#) group can be "on" at a time. This allows the user to select on of a possible range of options. See [RadioButton](#) for more information.

### Coding the component

In project source code, use this syntax to create a new [CheckboxGroup](#):

```
group1 = new CheckboxGroup();
```

Where *group1* is the variable name used to identify the [Checkbox](#) group in code.

In project source code, use this syntax to create a new [Checkbox](#):

```
checkbox1 = new java.awt.Checkbox(String label, CheckboxGroup group, boolean state);
```

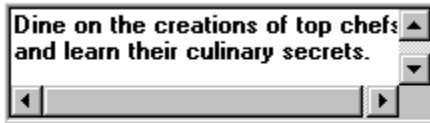
Part	Type	Description
------	------	-------------

checkbox1	Checkbox	The variable name used to identify the checkbox in code.
label	String	The text to display next to the checkbox.
group	CheckboxGroup	The CheckboxGroup, or null for no group.
state	boolean	The initial state of the check box: true is "checked"; false is "unchecked".

### Example

The following screen shot shows a single CheckBox component below a TextArea component.

### Description



Set as default

## Checkbox Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Data Binding](#) (dbAWARE only)

[Empty Means Null](#) (dbAWARE only)

[Enabled](#)

[False String](#) (dbAWARE only)

[Font](#)

[Foreground](#)

[Group](#) (standard only)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Label](#)

[Name](#)

[State](#)

[Triggering Event](#) (dbAWARE only)

[True String](#) (dbAWARE only)

[Visible](#)

## ComboBox component (standard/dbAWARE)

```
{button Properties,PI('vcafe.hlp','ComboBox_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_ComboBox')} {button API (standard),JI('APIRef.hlp','symantec.itools.awt.ComboBox.html')} {button API (dbAWARE),JI('APIRef.hlp','symantec.itools.db.awt.ComboBox.html')}
```

### Description

A text box with an attached list box. Users can either type the desired value into the text box or select their choice using the list box.

Use a ComboBox to

- compactly display a list of items,
- manage a list of items longer than the display window size,
- change display fonts and colors and add edit and search functions.

When you include a ComboBox in a container, make sure that the attached list box doesn't cover up other components at run time.

### dbAWARE features

A dbAWARE version of the ComboBox component is available in Visual Cafe *Database Developer Edition*.

This component automatically updates the database when certain triggering events occur. See [Events Triggering Database Updates](#) for more information.

The [Data Binding property](#) is used to bind this component with a specific data item in the database.

The [Empty Means Null property](#) defines how a component with no value (empty) is saved in the database.

The [Lookup Name property](#) is used to bind the component with an entire column in the database.

The [Triggering Event property](#) specifies which event makes the component commit its value to the database.

### Properties

To add an item to a ComboBox list box, use [List Items property](#) in the Property List window. To include more than one item in the list, press CTRL+ENTER (on PCs) or RETURN (on Macs) after typing each item.

To create a ComboBox that includes a scroll bar, set the [Show Horizontal Scrollbar](#) and/or [Show Vertical Scrollbar property](#) to true. You do not need to associate scroll bars manually. Vertical Scrollbars can be used to scroll through items when a ComboBox has a larger number of items in the list than can be displayed in the dropdown area.

To use a different font in the ComboBox, set the [Font property](#).

A searchable ComboBox allows the user to enter text into the text field as long as it matches one of the existing list items. This allows the user to select from a non-editable list by typing instead of dropping-down the list and selecting with the mouse. To make the ComboBox searchable, set the [Searchable property](#) to true.

Use the [Text property](#) to set the initial value.

### Example

This ComboBox example has the ComboBox Font property set to Times Roman and the Foreground property set to Blue.





## ComboBox Properties

[Auto Expand](#) (dbAWARE only)

[Background](#)

[Bounds](#)

[Case-sensitive](#)

[Class](#)

[Cursor](#)

[Data Binding](#) (dbAWARE only)

[Editable](#)

[Empty Means Null](#) (dbAWARE only)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[List Down](#)

[List Items](#)

[Lookup Name](#) (dbAWARE only)

[Name](#)

[Searchable](#)

[Show Horizontal Scrollbar](#)

[Show Vertical Scrollbar](#)

[Text](#)

[Triggering Event](#) (dbAWARE only)

[Visible](#)

## FormattedTextField component (standard/dbAWARE)

```
{button Properties,PI('vcafe.hlp','FormattedTextField_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_FormattedTextField')} {button API (standard),JI('APIRef.hlp','symantec.itools.awt.FormattedTextField.html')} {button API (dbAWARE),JI('APIRef.hlp','symantec.itools.db.awt.FormattedTextField.html')}
```

### Description

A text field which has text formatting logic applied to the user input.

Use a FormattedTextField to

- limit the type of text that can be entered in a text field,
- display text captured from the keyboard,
- edit a line of text,
- post an [event](#) based on text input from the keyboard.

To take action based on FormattedTextField events or text, use the Interaction Wizard.

If the text box already contains text, the user can select the default text and delete or edit it. **Note:** If the mask is set after the text is initialized, the text in the edit field vanishes. You need to call the [setText](#) method after [setMask](#).

FormattedTextField does not support logical AND, OR or XOR constructs and does not interactively prompt the user to retry input upon error. You must write project source code to accomplish these tasks.

### dbAWARE features

A dbAWARE version of the FormattedTextField component is available in Visual Cafe *Database Developer Edition*.

The dbAWARE version allows you to control the display of a column value by using a text mask.

This component automatically updates the database when certain triggering events occur. See [Events Triggering Database Updates](#) for more information.

The [Data Binding property](#) is used to bind this component with a specific data item in the database.

The [Empty Means Null property](#) defines how a component with no value (empty) is saved in the database.

The [Triggering Event property](#) specifies which event makes the component commit its value to the database.

### Properties

To specify the required format for the text entry, use the [Mask property](#).

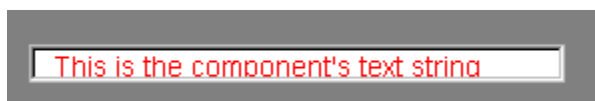
To specify a text string to display in the field by default, use [Text property](#).

To make the default text editable, use the [Editable property](#). You do not need to write code or use the Interaction Wizard to connect the FormattedTextField component with any other component to display text.

To hide the text that displays in the component, use the [Echo Char property](#) to specify a character to display in place of the characters in the string.

### Example

This screen shot shows a FormattedTextField with Foreground red, a 14 pt font, and a predefined Text string. The Field's parent container's background is gray.



## FormattedTextField Properties

[Background](#)

[Bounds](#)

[Class](#)

[Columns](#)

[Cursor](#)

[Data Binding](#) (dbAWARE only)

[Echo Char](#)

[Editable](#)

[Empty Means Null](#) (dbAWARE only)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Mask](#)

[Name](#)

[Text](#)

[Triggering Event](#) (dbAWARE only)

[Visible](#)

## ImageViewer component (standard/dbAWARE)

```
{button Properties,PI('vcafe.hlp','ImageViewer_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button Example,JI('vcafe.hlp','Example_ImageViewer')} {button API (standard),JI('APIRef.hlp','symantec.itools.multimedia.ImageViewer.html')} {button API (dbAWARE),JI('APIRef.hlp','symantec.itools.db.awt.ImageViewer.html')}
```

### Description

A platform-independent displayable image. An ImageViewer can be initialized from a URL pointing to a GIF or JPEG image, or through an Image object.

Instantiate an Image object through the [getImage](#) or [createImage](#) methods. The Image's [getSource](#) method returns an ImageProducer object that produces the image data. [getGraphics](#) returns a Graphics object. [getProperty](#) returns the value of a specified property.

### dbAWARE features

A dbAWARE version of this component is available in Visual Cafe *Database Developer Edition*.

Use this component to

- display images that are stored in a database column (projection name) in a Relation View,
- load an image from a non-database source, display the image, and then store the image.

Currently only JPG format is supported.

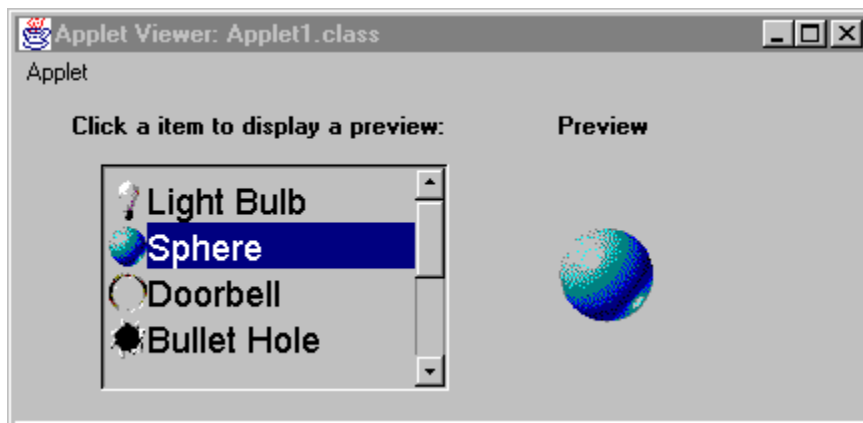
The [Data Binding property](#) is used to bind this component with a specific data item in the database.

### Properties

For non-database applications, use the [Image URL property](#) and [Image Style property](#) to identify the image and define the image's centering. These properties are not supported in the dbAWARE version of the ImageViewer.

### Example

This screen shot shows an [ImageListBox component](#) (left) and an ImageViewer component (right, under Preview).



## ImageViewer Properties

[Background](#) (dbAWARE only)

[Bounds](#)

[Class](#)

[Cursor](#)

[Data Binding](#) (dbAWARE only)

[Enabled](#)

[Font](#) (dbAWARE only)

[Foreground](#) (dbAWARE only)

[Image Style](#) (standard only)

[Image URL](#) (standard only)

[Inherit Background](#) (dbAWARE only)

[Inherit Font](#) (dbAWARE only)

[Inherit Foreground](#) (dbAWARE only)

[Name](#)

[Visible](#)

## Label component (standard/dbAWARE)

```
{button Properties,PI('vcafe.hlp','Label_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_Label')} {button API (standard),JI('APIRef.hlp','java.awt.Label.html')} {button API (dbAWARE),JI('APIRef.hlp','symantec.itools.db.awt.Label.html')}
```

### Description

A text string that is usually attached to another visual component (like a TextField or Button).

Use this component to:

- label a TextArea, or any other component that does not have a viewable label,
- display static, explanatory text,
- display a simple status area.

An application or applet can change the label text string, but a user cannot edit it.

The following predefined dbAWARE components are provided for your convenience:

[RecordNumberLabel](#)      [RecordStateLabel](#)

### dbAWARE features

A dbAWARE version of the Label component is available in Visual Cafe *Database Developer Edition*.

The [Data Binding property](#) is used to bind this component with a specific data item in the database.

Using a dbAWARE label allows you to provide labels on components that change due to some criteria. dbAWARE labels function like a TextField, but are not editable. The text string for the label is obtained from the database column at runtime.

One use for a dbAWARE label is to display different labels for form fields based on a prior language type selection. For example, if your user selects Italian as the preferred language, you can retrieve your Italian label values and use them when the form displays.

### Properties

To specify the label text, type the text in the [Text property](#).

### Coding the component

In code, use this syntax to create a new Label:

```
label1 = new java.awt.Label(label, alignment);
```

Part	Type	Description
label1	Label	The variable name you can use to identify the component in code.
label	String	The text to display in the label.
alignment	int	Positions text within the label bounding box. If no alignment is specified, the label is automatically left-aligned. Legal values are LEFT, RIGHT, and CENTER.

### Example

This example shows two standard Label components for two TextFields.



## **Label Properties**

[Alignment](#)

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Data Binding](#) (dbAWARE only)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[Text](#)

[Visible](#)



## List component (standard/dbAWARE, dbANYWHERE)

```
{button Properties,PI('vcafe.hlp','List_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button API  
(standard),JI('APIRef.hlp','java.awt.List.html')} {button API (dbAWARE),JI('APIRef.hlp','symantec.itools.db.awt.List.html')}
```

### Description

A box containing a scrollable and selectable list of items.

When a List item is selected or deselected, an ItemEvent is generated (see [item state changed](#)). When a user double-clicks on an item, the DbClicked action performed event is generated (see [action performed](#)). Use the Interaction Wizard to perform some action triggered by these (and other) events.

A List automatically displays with scroll bars when the display area is not large enough to display all the list items.

### dbAWARE features

A dbAWARE version of the List component is available in Visual Cafe *Database Developer Edition*.

**Note:** For JDBC, use the [ListPlus component](#) instead of the List component. For dbANYWHERE, use this List component.

Four of the [binding](#) subproperties are present: RelView Name, Projection Name, Dynamic Update, and Empty Means Null.

RelView Name is the name of the [RelationViewPlus component](#) this component is bound to.

Projection Name is the name of the database column that this component is bound to.

**Note:** You can also use the column number instead of the column name. The column number is the one-relative index of the projection in the RelationViewPlus.

Dynamic Update defines when update data is sent to the MultiView. Values in the MultiView are sent to the database when the RelationViewPlus save method is invoked. (For information on MultiView, see the dbANYWHERE API HTML online documentation.)

Empty Means Null defines how a component with no value (empty) is saved in the database.

The List component is bound to a database column (projection) and the component is populated as defined in the [Lookup property](#).

Scrollbars display on the list box when the selected data fills the display area.

When both the [Items](#) property and [Lookup](#) properties are defined for a List component, the list of values are combined.

A master view/List component relationship is very much like a master/detail relationship. In a master view/List relationship, the list changes as a master value changes. In a master/detail view, the detail changes when the master record changes, and the SQL statement is run.

### Properties

To specify the initial items to use to populate the List, use the [Items property](#). To include more than one item in the list, press CTRL+ENTER (on PCs) or RETURN (on Macs) after typing each item.

To allow your user to select either one item exclusively, or to select multiple items at once, set the [Multiple Mode property](#).

Use the Interaction Wizard to trigger actions based on user activity.

### Runtime modification

To:	Use:
Add items to a list	<a href="#">addItem(String item)</a>
Add items at a particular position	<a href="#">addItem(String item, int index)</a> . The item is placed before the index, for example, inserting an item at position 0 adds the new item to the very start of the list box. Use an index of -1 to place the item at the end of the list.
Remove all items from the list	<a href="#">removeAll()</a>

- Delete an item [delItem\(int position\)](#)  
Position 0 is the first item in the list.
- Get the current selected item [getSelectedIndex\(\)](#) or [getSelectedIndexes\(\)](#), for lists with multiple selection turned on.
- Remove all selected items A code sequence like the following:
- ```
int[] selectedItems;
selectedItems=list1.getSelectedIndexes\(\);
for (int index=selectedItems.size; index>=0; index--)
    list1.delItem\(selectedItems\[index\]\);
```

### Coding the component

To create a new List component, use this syntax:

```
list1 = new java.awt.List(rows, multipleSelections);
```

This creates a new scrolling list initialized to display the specified number of rows. If the multipleSelections argument is true, then the user can select multiple items at a time from the list. If it is false, only one item at a time can be selected.

| Part               | Type    | Description                                                                                                                   |
|--------------------|---------|-------------------------------------------------------------------------------------------------------------------------------|
| list1              | List    | The variable name used to refer to the component in code.                                                                     |
| rows               | int     | The number of items to display in the list. If this parameter is omitted, the list height is zero, and therefore not visible. |
| multipleSelections | boolean | Whether the list allows multiple selections.                                                                                  |

The settings for *multipleSelections* are:

| Value | Description                                        |
|-------|----------------------------------------------------|
| true  | Multiple selections are allowed.                   |
| false | (Default) Only one item can be selected at a time. |

## List Properties

[Background](#)

[Binding](#) (dbAWARE only)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Items](#)

[Lookup](#) (dbAWARE only)

[Multiple Mode](#)

[Name](#)

[Visible](#)

[Visible Rows](#)

## ListPlus component (dbAWARE, JDBC)

```
{button Properties,PI('vcafe.hlp','ListPlus_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button API  
(dbAWARE),JI('APIRef.hlp','symantec.itools.db.awt.ListPlus.html')}
```

### Description

A box containing a scrollable and selectable list of items.

When a List item is selected or deselected, an ItemEvent is generated (see [item state changed](#)). When a user double-clicks on an item, the DbClicked action performed event is generated (see [action performed](#)). Use the Interaction Wizard to perform some action triggered by these (and other) events.

A List automatically displays with scroll bars when the display area is not large enough to display all the list items.

### dbAWARE features

A dbAWARE version of the List component is available in *Visual Cafe Database Developer Edition*.

**Note:** For dbANYWHERE, use the [List component](#) component instead of the ListPlus component. For JDBC, use this ListPlus component.

This component automatically updates the database when certain triggering events occur. See [Events Triggering Database Updates](#) for more information.

The [Data Binding property](#) is used to bind this component with a specific data item in the database.

The [Lookup Name property](#) is used to bind the component with an entire column in the database.

The [Triggering Event property](#) specifies which event makes the component commit its value to the database.

Scrollbars display on the list box when the selected data fills the display area.

A master view/List component relationship is very much like a master/detail relationship. In a master view/List relationship, the list changes as a master value changes. In a master/detail view, the detail changes when the master record changes, and the SQL statement is run.

### Properties

To allow your user to select either one item exclusively, or to select multiple items at once, set the [Multiple Mode property](#).

Use the Interaction Wizard to trigger actions based on user activity.

### Coding the component

To create a new List component, use this syntax:

```
list1 = new java.db.awt.ListPlus(rows);
```

This creates a new scrolling list initialized to display the specified number of rows.

| Part  | Type | Description                                                                                                                   |
|-------|------|-------------------------------------------------------------------------------------------------------------------------------|
| list1 | List | The variable name used to refer to the component in code.                                                                     |
| rows  | int  | The number of items to display in the list. If this parameter is omitted, the list height is zero, and therefore not visible. |

## ListPlus Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Data Binding](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Lookup Name](#)

[Multiple Mode](#)

[Name](#)

[Triggering Event](#)

[Visible](#)

## NervousText component (standard/dbAWARE)

```
{button Properties,PI('vcafe.hlp','NervousText_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_NervousText')} {button API (standard),JI('APIRef.hlp','symantec.itools.multimedia.NervousText.html')} {button API (dbAWARE),JI('APIRef.hlp','symantec.itools.db.awt.NervousText.html')}
```

### Description

Creates animated text in which each letter moves independently of all other letters. This multimedia component is provided for novelty and programming convenience.

### dbAWARE features

A dbAWARE version of the NervousText component is available in *Visual Cafe Database Developer Edition*.

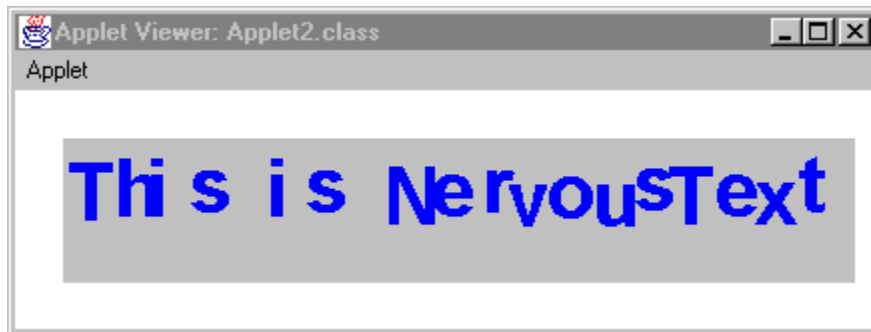
The [Data Binding property](#) is used to bind this component with a specific data item in the database.

### Properties

To add the text that appears within the component, use the [Text property](#) (for the standard version), or use the RelView Name and the Projection Name (for the dbAWARE version).

### Example

This is a screen shot of NervousText at runtime.



## **NervousText Properties**

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Data Binding](#) (dbAWARE only)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[Paused](#)

[Text](#)

[Visible](#)

## RadioButton component (standard/dbAWARE)

```
{button Properties,PI('vcafe.hlp','RadioButton_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button Example,JI('vcafe.hlp','Example_RadioButton')} {button API (standard),JI('APIRef.hlp','java.awt.Checkbox.html')} {button API (dbAWARE),JI('APIRef.hlp','symantec.itools.db.awt.RadioButton.html')}
```

### Description

A round button used to select one choice from several options.

Use A RadioButton to:

- manage a selection-deselection user task,
- display a selection choice,
- post an event to another component,
- determine that only one choice in a set of choices is selected.

Typically, a RadioButton will be a member of a group. In a group of radio buttons, only one can be selected at a time. When the user selects one radio button, the other radio buttons in the group are automatically deselected.

When you add RadioButtons to your form they are automatically added to group, created as needed. Standard RadioButtons use a group of class `CheckboxGroup`. dbAWARE RadioButtons use a group of class `RadioBox`.

Use the Interaction Wizard to trigger an action when a RadioButton is clicked.

### dbAWARE features

The column value is used as the component label value.

When you add the first dbAWARE RadioButton to a project, a [RadioBox component](#) is created. This component is used to bind the RadioButtons to the database.

### Properties

To set the default state, checked or cleared, of the RadioButton, use the [State property](#).

### Coding the standard component

In project source code, a radio button is identical to a check box, except it belongs to a `CheckboxGroup`.

To create a radio button, you must first have a `CheckboxGroup` to which you add the radio button. The code sample below shows the syntax required for creating `group1` a new `CheckboxGroup`.

```
group1 = new CheckboxGroup();
```

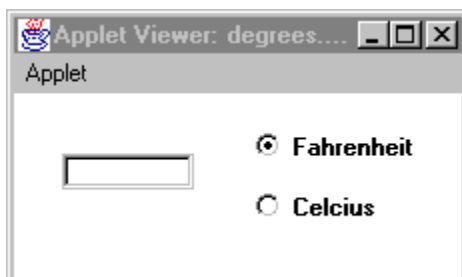
To create the radio button, create a check box and add it to a check box group. Use this syntax to create a radio button:

```
radioButton1 = new java.awt.Checkbox(label, Group1, state);
```

| Part         | Type          | Description                                                                                         |
|--------------|---------------|-----------------------------------------------------------------------------------------------------|
| radioButton1 | Checkbox      | The variable name used in code to refer to the component.                                           |
| label        | String        | The text to display next to the component.                                                          |
| group1       | CheckboxGroup | The <code>CheckboxGroup</code> , or null for no group (resulting in a check box, not radio button). |
| state        | boolean       | The initial state: true is "checked"; false is "unchecked".                                         |

### Example

The following shows RadioButton and TextField components at runtime.







## RadioButton Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Group](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Label](#)

[Name](#)

[State](#)

[Visible](#)

## TextArea component (standard/dbAWARE)

```
{button Properties,PI('vcafe.hlp','TextArea_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_TextArea')} {button API (standard),JI('APIRef.hlp','java.awt.TextArea.html')} {button API (dbAWARE),JI('APIRef.hlp','symantec.itools.db.awt.TextArea.html')}
```

### Description

An editable multi-line display window with two scroll bars. The display window can scroll through an amount of text that is too large to display at one time.

You cannot remove the scrollbars.

Use a TextArea to:

- display large sections of text,
- edit a block of text,
- scroll through a large block of text,
- post an event based on text input from the keyboard.

Use the Interaction Wizard to trigger one or more actions when the TextArea generates events.

The TextArea provides methods to add, delete and select text, but does not support text editing. You must write custom code to provide new editing functions.

**Note:** For many purposes, you can use the Interaction Wizard to bind the KeyTyped event in order to receive notification whenever a user presses any key in the text area. This is often good enough to replace a true change notification.

### dbAWARE features

A dbAWARE version of this component is available in Visual Cafe *Database Developer Edition*.

Use this component to display long database strings or other text data.

This component automatically updates the database when certain triggering events occur. See [Events Triggering Database Updates](#) for more information.

The [Data Binding property](#) is used to bind this component with a specific data item in the database.

The [Empty Means Null property](#) defines how a component with no value (empty) is saved in the database.

The [Triggering Event property](#) specifies which event makes the component commit its value to the database.

### Properties

To make the TextArea text read-only, use the [Editable property](#).

### Coding the component

To select text, use TextArea's [select](#) and [selectAll](#) methods in your project source code.

To edit text, use TextArea's [append](#), [insert](#) and [replaceRange](#) methods.

To use the TextArea as a read-only text area, use the [setEditable](#) call.

By default, TextArea behavior accepts keyboard input and displays that input in its display pane. You can use the Interaction Wizard to change this default behavior.

When the TextArea receives or loses the focus, the [Focus Gained](#) or [Focus Lost](#) events are triggered.

To create a new TextArea component in project source code, use the following syntax:

```
text1 = new java.awt.TextArea(text, rows, cols);
```

| Part  | Type     | Description                                                                    |
|-------|----------|--------------------------------------------------------------------------------|
| text1 | TextArea | A variable which you use to reference the component in code.                   |
| text  | String   | The text to display in the text field.                                         |
| cols  | int      | The width (in characters) that the text field can display and accept as input. |
| rows  | int      | The number of rows of text that the text area can display.                     |

**Example**

This screen shot shows a TextArea component that is populated with data from a database column.



## TextArea Properties

[Background](#)

[Bounds](#)

[Class](#)

[Columns](#)

[Data Binding](#) (dbAWARE only)

[Cursor](#)

[Editable](#)

[Empty Means Null](#) (dbAWARE only)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[Rows](#)

[Text](#)

[Triggering Event](#) (dbAWARE only)

[Visible](#)

## TextField component (standard/dbAWARE)

```
{button Properties,PI('vcafe.hlp','TextField_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_TextField')} {button API (standard),JI('APIRef.hlp','java.awt.TextField.html')} {button API (dbAWARE),JI('APIRef.hlp','symantec.itools.db.awt.TextField.html')}
```

### Description

A box in which your user can type text.

Use TextField to:

- display text captured from the keyboard,
- edit a line of text,
- post an event based on text input from the keyboard.

Use the Interaction Wizard to trigger one or more actions when the TextField generates events.

If the text box already contains text, the user can select the default text and delete or edit it.

The TextField provides methods to add, delete and select text, but does not support text editing. You must write custom code to provide new editing functions.

Visual Cafe *Database Developer Edition* provides the following additional TextField component subclasses:

[FormattedTextField](#)

[DBTstamp](#)

### dbAWARE features

A dbAWARE version of this component is available in Visual Cafe *Database Developer Edition*.

Use this component to display database strings. This component can be resized, but does not have horizontal or vertical scrollbars.

This component automatically updates the database when certain triggering events occur. See [Events Triggering Database Updates](#) for more information.

The [Data Binding property](#) is used to bind this component with a specific data item in the database.

The [Empty Means Null property](#) defines how a component with no value (empty) is saved in the database.

The [Triggering Event property](#) specifies which event makes the component commit its value to the database.

### Properties

Use the [Editable property](#) to make the default text editable. You do not need to write code or use the Interaction Wizard to connect the TextField component with any other component to display text.

**Note:** For convenience, TextField supports several formatted components, which prompt for telephone numbers, zip codes and other formatted user entry strings. See the component listing under Predefined TextFields in the Component Library.

### Coding the component

To select text, use TextField's [select](#) and [selectAll](#) methods in your project source code.

To use the TextField as a read-only text area, use the [setEditable](#) call.

When the TextArea receives or loses the focus, the [Focus Gained](#) or [Focus Lost](#) events are triggered.

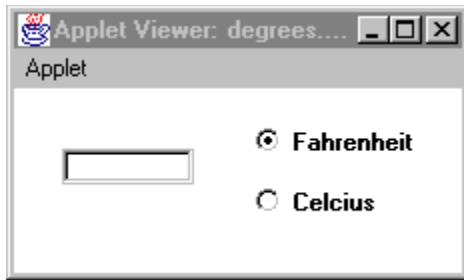
To create a new TextField component in project source code, use the following syntax:

```
text1 = new java.awt.TextField(text, cols);
```

| Part  | Type      | Description                                                                    |
|-------|-----------|--------------------------------------------------------------------------------|
| text1 | TextField | A variable which you use to reference the component in code.                   |
| text  | String    | The text to display in the text field.                                         |
| cols  | int       | The width (in characters) that the text field can display and accept as input. |

### Example

The following shows RadioButton and TextField components at runtime.



## **TextField Properties**

[Background](#)

[Bounds](#)

[Class](#)

[Columns](#)

[Cursor](#)

[Data Binding](#) (dbAWARE only)

[Echo Char](#)

[Editable](#)

[Empty Means Null](#) (dbAWARE only)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[Text](#)

[Triggering Event](#) (dbAWARE only)

[Visible](#)



## DDE-only Components



## **Add Table Wizard**

The Add Table Wizard component starts the corresponding Visual Cafe DDE wizard. Use this wizard to quickly add tables to your application or form.

This component is available in Visual Cafe *Database Developer Edition* only.

## ConnectionInfo component(dbAWARE only)

```
{button Properties,PI('vcafe.hlp','ConnectionInfo_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button API,JI('APIRef.hlp','symantec.itools.db.pro.ConnectionInfo.html')}
```

### Description

An invisible component that defines a data source. Connection information includes the name of the data source, user login name, and user password.

This component is available in Visual Cafe *Database Developer Edition* only.

At design time, the ConnectionInfo component is represented by the following icon:



You can drag the ConnectionInfo component from the Component Palette or Library onto a form at any location, or into the Project window. Also, you can use the Project Wizard or the Add Table Wizard. These two wizards create any necessary ConnectionInfo, [Session](#), and [RelationViewPlus](#) components that are needed.

A project can contain more than one ConnectionInfo component. And, each data source has one ConnectionInfo component. The ConnectionInfo component must have a Session component to connect it to the dbANYWHERE server.

**See:** For more information on the Session class, see the dbANYWHERE API online HTML manual.

### Properties

**Note:** Do not change ConnectionInfo component properties at runtime.

Use [Data Source Name property](#) to indicate the data source to connect to.

The [Name property](#) contains the name of the actual Java object that instantiates the ConnectionInfo class. This value usually closely matches the data source name. Characters, such as spaces or punctuation in the data source name, are replaced with underscores to create a valid Java variable name.

Use the [User Password](#) and [User Name properties](#) to provide logon requirements.

## ConnectionInfo Properties

[Auto Disconnect](#)

[Class](#)

[Data Source Name](#)

[Name](#)

[User Name](#)

[User Password](#)

## DBTstamp component (dbAWARE only)

```
{button Properties,PI('vcafe.hlp','DBTstamp_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button  
API,JI('APIRef.hlp','symantec.itools.db.awt.DBTstamp.html')}
```

### Description

A component that creates a box in which a date or timestamp can be read or entered using any common date or time format.

This component is available in Visual Cafe *Database Developer Edition* only.

Use DBTstamp to:

- Edit a date or a timestamp.
- Display a date or timestamp in a pre-defined display format.

To add a DBTstamp component to your project, drag the DBTstamp icon from the Palette to your Form Designer window. This component can be resized, but does not have horizontal or vertical scrollbars.

### Properties

The [Data Binding property](#) is used to bind this component with a specific data item in the database.

The [Empty Means Null property](#) defines how a component with no value (empty) is saved in the database.

DBTstamp controls how the data is entered using the property [Format on Entry](#).

DBTstamp controls how the data is displayed using the property [Format on Display](#).

You can choose among Date, Time and Timestamp. This selection will set the following default formats:

- Date: Friday October 12th, 1973
- Time: 10:34:52 PM
- Timestamp: Friday October 12th,1973 10:34:54,000 AM

## **DBTstamp Properties**

[Background](#)

[Bounds](#)

[Class](#)

[Columns](#)

[Cursor](#)

[Data Binding](#)

[Echo Char](#)

[Editable](#)

[Empty Means Null](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Format on Display](#)

[Format on Entry](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[Text](#)

[Tstamp](#)

[Visible](#)

## Grid component (dbAWARE only)

```
{button Properties,PI('vcafe.hlp','Grid_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button Example,JI('vcafe.hlp','Example_Grid')} {button API,JI('APIRef.hlp','symantec.itools.db.awt.Grid.html')}
```

### Description

A component for displaying multiple data records.

This component is available in Visual Cafe *Database Developer Edition* only.

Provides an array, or spreadsheet-like display, of specified data. You can also specify predefined buttons that will appear at the bottom of the grid. These buttons are defined in the [Binding property](#).

You can adjust column widths at runtime.

Column heading text can be customized in code only.

**Note:** When you drop a Grid on a form, the Grid displays empty. You do not see data populated in the Grid until runtime.

**Tip:** The easiest way to add a RelationViewPlus component for a [Grid component](#) is to simply drag a table name from the dbNAVIGATOR window onto a form. Visual Cafe DDE creates the RelationViewPlus and fills in its properties. Then, select the Grid component from the dbAWARE tab on the Component Palette, drag to the Form Designer, and size as needed. Last, set the Grid's RelationViewPlus element in the [Binding property](#).

See:

[Adding a Grid component](#)

[Adding a Grid component to a form as a detail view](#)

[Changing Grid cell attributes](#)

[Protecting a Grid column](#)

[Changing Grid column attributes](#)

[Defining automatic Grid row numbering](#)

[Defining automatic Grid redraw](#)

[Modifying the Grid toolbar](#)

### Properties

The [Data Binding property](#) is used to bind this component with a specific data item in the database.

### Example

The screen shot below show the default Grid for the Visual Cafe tutorial's DBA.registration table.

The columns display in the Grid, from left to right, in the same order that they appear in the dbNAVIGATOR window. If query columns do not fit within the Grid component, a scrollbar is provided.

The Grid component uses the database column names as the Grid column headings. You can narrow the queried columns by adjusting the SELECT clause in the associated RelationViewPlus component's [Select Clause property](#).

Notice the placement of the Grid buttons.

Applet Viewer: Applet1.class

Applet

|    | Registration_ID | Package_ID | Customer_First_Nam | Cu   |
|----|-----------------|------------|--------------------|------|
| 0  | 6               | 780        | Carl               | Thr  |
| 1  | 0               |            |                    |      |
| 2  | 7               | 780        | Cheryl             | Pot  |
| 3  | 8               | 780        | fjdsfkfkl          | fjkd |
| 4  | 9               | 782        | aaaaaa             | bbb  |
| 5  | 10              | 782        |                    |      |
| 6  | 11              | 784        |                    |      |
| 7  | 12              | 782        |                    |      |
| 8  | 13              | 782        | Bradley            | Ken  |
| 9  | 14              | 788        |                    |      |
| 10 | 15              | 788        |                    |      |

Undo Delete Undelete



## **Grid Properties**

[Background](#)

[Bounds](#)

[Button: Delete](#)

[Button: Goto](#)

[Button: Insert](#)

[Button: Restart](#)

[Button: Save](#)

[Button: Undo](#)

[Class](#)

[Cursor](#)

[Data Binding](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[Number Of Columns](#)

[Number Of Rows](#)

[Toolbar Background](#)

[Visible](#)



## RecordNumberLabel component(dbAWARE only)

```
{button Properties,PI(`vcafe.hlp`,`Record_Label_Properties`)} {button Events,PI(`vcafe.hlp`,`Events_summary`)} {button API,JI(`APIRef.hlp`,`symantec.itools.db.awt.RecordNumberLabel.html`)}
```

### Description

At runtime, displays the current record's number in the retrieved record set. This may be a useful addition to your form.

This component is available in Visual Cafe *Database Developer Edition* only.

### Properties

Use the [Data Source Alias property](#) to bind this component with a particular data source (QueryNavigator).

**Note:** The Text property has no effect in this component.

## RecordStateLabel component (dbAWARE only)

```
{button Properties,PI(`vcafe.hlp`,`Record_Label_Properties`)} {button Events,PI(`vcafe.hlp`,`Events_summary`)} {button API,JI(`APIRef.hlp`,`symantec.itools.db.awt.RecordStateLabel.html`)}
```

### Description

At runtime, this component displays the state of the current record.

This component is available in Visual Cafe *Database Developer Edition* only.

Use this component to provide record status information on your form.

Possible record states are:

- Existing
- Modified
- New
- Marked for Deletion
- Deleted
- New Modified
- Invalid

### Properties

Use the [Data Source Alias property](#) to bind this component with a particular data source (QueryNavigator).

**Note:** The Text property has no effect in this component.

## Record Label Properties

[Alignment](#)

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Data Source Alias](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[Text](#)

[Visible](#)

## RadioBox component (dbAWARE only)

```
{button Properties,PI('vcafe.hlp','RadioBox_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button  
API,JI('APIRef.hlp','symantec.itools.db.awt.RadioBox.html')}
```

### Description

A dbAWARE component with no visual properties that acts like a container to group radio button components. The RadioBox component allows you to bind RadioButton components to a database column.

This component is available in Visual Cafe *Database Developer Edition* only.

**Important:** Only use the dbAWARE version of the [RadioButton component](#) in a RadioBox.

### Properties

The [Data Binding property](#) is used to bind this component with a specific data item in the database.

The [Empty Means Null property](#) defines how a component with no value (empty) is saved in the database.

**Important:** RadioBox properties need to be defined before any dbAWARE RadioButton properties are defined.

## RadioButton Properties

[Class](#)

[Data Binding](#)

[Empty Means Null](#)

[Name](#)

## RelationViewPlus component (dbAWARE only)

```
{button Properties,PI('vcafe.hlp','RelationView_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button API,JI('APIRef.hlp','symantec.itools.db.pro.RelationView.html')}
```

### Description

An invisible component that defines a view of a database table and defines how the data is retrieved from the dbANYWHERE server -- a query against the database.

This component is available in Visual Cafe *Database Developer Edition* only.

When a RelationViewPlus is defined for a form, you see the following icon on the form at design time:



**Note:** The RelationViewPlus must be added *after* adding the [Session](#) and [ConnectionInfo component](#). The easiest way to add these components is by using the Project Wizard and Add Table Wizard.

- Access the Project wizard by selecting the dbAWARE Project Wizard from the File ► New Project dialog.
- Access the Add Table Wizard by selecting Insert ► Add Table Wizard or selecting the component from the Component Palette or Library.

A project can contain multiple RelationViews. These views can have a joined relationship, or they can be independent. In the case of a join, the first RelationViewPlus in a project is used as a master view. When you add a second RelationView component, you create a detail view, thereby forming a [master/detail relationship](#). The "join" between the two tables is created by defining a [Parent RelationView](#) and other associated [Join properties](#).

Use the Project Wizard for your first RelationViewPlus (the master view) and then Add Table Wizard for additional views.

When a master/detail relationship is formed, the relationship is considered to be within the same transaction. When the master view is saved, the detail view is also saved, and the entire transaction gets committed. Similarly, when the detail view is saved, the master view is also saved.

For details on creating a RelationViewPlus for a Grid component, see [Grid component](#).

### Using RelationViewPlus and MultiView classes

MultiView is a container class for the dbANYWHERE database transaction object. A MultiView contains a transaction's RelationViews. To interact with a dbANYWHERE Server you do not have to interface directly with a MultiView object, the RelationView class can encapsulate a MultiView object. For example, RelationView.saveMultiView( ) translates to MultiView.save( ) for the RelationView's parent MultiView. However, a MultiView object can be useful to global transactions that have a handle to a MultiView object. For more information on MultiView, see the dbANYWHERE API online HTML reference.

**See:** For more information on RelationView, MultiView, and AutoDetail classes, see the dbANYWHERE API online HTML manual.

### Properties

**Note:** Do not change RelationViewPlus component properties at runtime.

A RelationViewPlus's SQL statement (Select Clause property) defines the view. You can create a view that is a detail view or a view that is not a detail view.

This screen shot shows the Property List for a RelationViewPlus component that was automatically created when a table name from the dbNAVIGATOR window was dragged in to the Form Designer.

| Property List - Applet1 |                                     |
|-------------------------|-------------------------------------|
| DBA_contact             |                                     |
| Class                   | symantec.itools.db.pro.RelationView |
| ConnectionInfo          | sademo                              |
| Initial Record Position | First                               |
| Join                    |                                     |
| Parent RelationView     |                                     |
| Join Columns            | [empty]                             |
| Cardinality             | One to Many                         |
| Maximum Rows            | 1                                   |
| Name                    | DBA_contact                         |
| Optimistic Concurrency  | All                                 |
| Read Only               | true                                |
| Select Clause           | SELECT * FROM DBA.contact           |
| Session                 | dbpro                               |
| Sharable                | false                               |



## RelationViewPlus Properties

[Class](#)

[ConnectionInfo](#)

[Initial Record Position](#)

[Join](#)

[Name](#)

[Optimistic Concurrency](#)

[Select Clause](#)

[Session](#)

## Session component (dbAWARE only)

```
{button Properties,PI('vcafe.hlp','Session_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button API,JI('APIRef.hlp','symantec.itools.db.pro.Session.html')}
```

### Description

An invisible component that defines the connection to a dbANYWHERE server, via a TCP network connection, and provides access to the dbANYWHERE classes. At runtime, the Session component generates code that creates a session with the dbANYWHERE server.

This component is available in Visual Cafe *Database Developer Edition* only.

Add a Session component *prior* to adding the [RelationViewPlus component](#). Use the name of this component as the value for the RelationViewPlus component's Session property. The easiest way to add these components is by using the Project Wizard and Add Table Wizard.

- Access the Project wizard by selecting the dbAWARE Project Wizard from the File ► New Project dialog.
- Access the Add Table Wizard by selecting Insert ► Add Table Wizard or selecting the component from the Component Palette or Library.

**Note:** It is recommended that all connections to a single dbANYWHERE server utilize the same Session component. This helps to reduce the number of server connections.

**Note:** A session can only represent one URL, so you can add multiple Session components to show data from different dbANYWHERE servers.

**See:** For more information the Session class, see the dbANYWHERE API online HTML manual.

### Properties

**Note:** Do not change Session component properties at runtime.

The [URL property](#) defines the dbANYWHERE server's URL (location and port number).

**See:** [About JDBC URLs](#) for more information about the URL format.

The [Name property](#) defines the name of the dbANYWHERE server that the project expects to access.

## Session Properties

Class

Name

URL

## JDBC Components

## ConnectionManager component (JDBC only)

```
{button Properties,PI('vcafe.hlp','ConnectionManager_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button API,JI('APIRef.hlp','symantec.itools.db.beans.jdbc.ConnectionManager.html')}
```

### Description

The ConnectionManager manages all the connections ([JdbcConnection](#)) of an application. It is a top-level non-visual bean, meaning that it is not contained within any form.

Dragging a Data Source item from dbNAVIGATOR to a project creates ConnectionManager and [JdbcConnection](#) objects, which manage connections to a data source. You have one ConnectionManager object per project, and one JdbcConnection object per data source.

This component is available in Visual Cafe *Database Developer Edition* only.

### Properties

**Note:** Do not change ConnectionManager component properties at runtime.

## ConnectionManager Properties

Class

Name

## JdbcConnection component (JDBC only)

```
{button Properties,PI('vcafe.hlp','JdbcConnection_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button API,JI('APIRef.hlp','symantec.itools.db.beans.jdbc.JdbcConnection.html')}
```

### Description

A JavaBean that wraps a single JDBC Connection. It has properties for establishing connection parameters in accordance with JDBC. Dragging a Data Source item from dbNAVIGATOR to a project creates JdbcConnection objects. You have one JdbcConnection object per data source. All of the JdbcConnections in the project are managed by a single ConnectionManager object.

This component is available in Visual Cafe *Database Developer Edition* only.

**See:** For more information on the JDBC Connection interface, see the Java JDBC HTML documentation.

### Properties

**Note:** Do not change JdbcConnection component properties at runtime.

The [Connect Failed Listener property](#) defines the class of the object that handles failed attempts to connect with the server.

The [JDBC Driver property](#) defines the class of the JDBC driver used.

The [Read Only property](#) determines whether the database may be modified through this connection. If true, the database may not be modified.

The [URL property](#) defines the database server's URL.

**See:** [About JDBC URLs](#) for more information about the URL format.

The [User Name property](#) is the name used to try to connect with the server.

The [User Password property](#) is the password to try to connect with the server.

## JdbcConnection Properties

[Catalog](#)

[Class](#)

[Connect Failed Listener](#)

[JDBC Driver Class](#)

[Name](#)

[Read Only](#)

[URL](#)

[User Name](#)

[User Password](#)



## Mediator component (JDBC only)

```
{button Properties,PI('vcafe.hlp','Mediator_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button  
API,JI('APIRef.hlp','symantec.itools.db.beans.binding.Mediator.html')}
```

### Description

A JavaBean that makes any component database-aware. It is a bridge between the component and the database. It can display single cell values as well as multi-dimensional arrays of cells.

At design time, you can add a Mediator component to a form in a project and set its properties for a particular component on the form. If you are creating a JavaBeans component or have access to the component Java code, you can add a mediator to the component code.

This component is available in Visual Cafe *Database Developer Edition* only.

### Properties

**Note:** Do not change Mediator component properties at runtime.

## Mediator Properties

[Class](#)

[Data Binding](#)

[Empty Means Null](#)

[Getter Methods](#)

[Name](#)

[Output](#)

[Setter Methods](#)

## MediatorDS component (JDBC only)

```
{button Properties,PI('vcafe.hlp','MediatorDS_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button API,JI('APIRef.hlp','symantec.itools.db.beans.binding.MediatorDS.html')}
```

### Description

A JavaBean that makes any component database-aware. It is a bridge between the component and a QueryNavigator or RelationView. It can display single cell values as well as multi-dimensional arrays of cells.

At design time, you can add a MediatorDS component to a form in a project and set its properties for a QueryNavigator or RelationViewPlus on the form. If you are creating a JavaBeans component or have access to the component Java code, you can add a MediatorDS to the component code.

This component is available in Visual Cafe *Database Developer Edition* only.

### Properties

**Note:** Do not change MediatorDS component properties at runtime.

## MediatorDS Properties

Class

Empty Means Null

Name

Output

## QueryNavigator component (JDBC only)

```
{button Properties,PI('vcafe.hlp','QueryNavigator_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button API,JI('APIRef.hlp','symantec.itools.db.beans.binding.QueryNavigator.html')}
```

### Description

A JavaBean that manages a set of records using the JDBC API. Dragging a Data Table item from the dbNAVIGATOR to a form in a project creates a QueryNavigator and a top-level RecordDefinition object. The QueryNavigator supports query-by-example, including sorting and the SQL WHERE clause.

This component is available in Visual Cafe *Database Developer Edition* only.

A project can contain multiple QueryNavigators. These views can have a joined relationship, or they can be independent. In the case of a join, the first QueryNavigator in a project is used as a master view. When you add a second QueryNavigator component, you create a detail view, thereby forming a [master/detail relationship](#). The "join" between the two QueryNavigators is created by specifying a [Master Alias Name](#) and other associated [Join properties](#).

### Properties

The [Alias Name property](#) gives this object a name so it may be referenced by others.

The [AutoStart property](#) determines whether the QueryNavigator is automatically filled when it is created. You may not want to have this done if, for example, you are creating an order-entry form to put records into the database, not look at the ones already there.

The [Filter property](#) constrains the data that is displayed in the component.

The [Join property](#) is used to specify a master/detail relationship with another QueryNavigator.

The [Sort Order property](#) specifies the order in which to sort the displayed data.

**Note:** Do not change QueryNavigator component properties at runtime.

## QueryNavigator Properties

[Alias Name](#)

[AutoStart](#)

[Class](#)

[Class Name](#)

[Filter](#)

[Join](#)

[Name](#)

[Sort Order](#)



## RecordDefinition component (JDBC only)

```
{button Properties,PI('vcafe.hlp','RecordDefinition_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button  
API,JI('APIRef.hlp','symantec.itools.db.beans.jdbc.RecordDefinition.html')}
```

### Description

This class is used to define and access a row of data in a database table. It is a top-level non-visual bean, meaning that it is not contained within any form.

This component is available in Visual Cafe *Database Developer Edition* only.

### Properties

**Note:** Do not change RecordDefinition component properties at runtime.

## RecordDefinition Properties

Class

JDBC Connection

JDBC Connection Manager

Name

Table Name



## Standard Components



## **No Help Available**

Help is not currently available for this component.

## AboutDialog component

```
{button Properties,PI('vcafe.hlp','Common_Dialog_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_AboutDialog')}
```

### Description

A dialog box where you can display general information about your program.

You can insert an AboutDialog component into a Window container, a Frame container or an Applet project.

You can extend this dialog by adding components. This is done by dragging components and containers to the Form Designer window as necessary.

### Tips:

- Use the Interaction Wizard to connect a component to the AboutDialog, so that your user can display the dialog box. Commonly, the AboutDialog is connected to the About menu item in a menu bar.

When you create a new project with the Basic Application template, a project is created automatically for you that contains a Frame, an AboutDialog, and QuitDialog (a custom built Dialog component). The frame contains a menu bar that has menu items preconnected to the dialog boxes.

- The easiest way to draw an Interaction Wizard "connection" line from a menu item to a dialog box component is to draw the line in the Project window.

### Properties

To edit the text string that displays in the About dialog box header bar, use the [Title property](#). To change the About dialog title dynamically at runtime, use the Interaction Wizard to display the About dialog box and create the title based on the parent frame's title or the frame's warning string.

### Example

This screen shot is of the default AboutDialog that you can create with Visual Cafe.



## Common Dialog Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Layout](#)

[Name](#)

[Resizable](#)

[Title](#)

[Visible](#)

## Animator component

```
{button Properties,PI('vcafe.hlp','Animator_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_Animator')} {button API,JI('APIRef.hlp','symantec.itools.multimedia.Animator.html')}
```

### Description

An animation that is created by displaying a series of images in sequence. This animation is static (there is no user interaction.) The sequence of images is drawn within the component using a [0,0] origin. Typically each image in the sequence is the same size.

To allow the user, or the program, to start and stop the animation, use the Interaction Wizard.

**See:** [MovingAnimation component](#) . The MovingAnimation component moves the image frames from left to right (or right to left) a predetermined amount each step.

### Properties

To specify the animation sequence, double-click on the [URL List property](#) to display the URL List dialog box. In the dialog box, enter a list of JPEG or GIF graphic files. List the files in the order you want them to be displayed.

To run an animated sequence one or more times set the [Loop Count property](#) .

Ignore the loop count and run an animated sequence forever by setting the [Repeat Mode property](#) to true.

To view your animation at design time, set the [Preview Component property](#) to true.

Ensuring the [Clear Frame property](#) is set to false prevents flickering caused by repainting the component background before drawing the component image.

### Example

There is a sample application that uses the Animator component in the release's Samples directory, under the subdirectory Animation. This example uses 37 GIF files to achieve the animation.

## **Animator Properties**

[Background](#)

[Bounds](#)

[Class](#)

[Clear Frame](#)

[Cursor](#)

[Delay](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Loop Count](#)

[Name](#)

[Preview Component](#)

[Repeat Mode](#)

[URL List](#)

[Visible](#)

## Applet component

```
{button Properties,PI('vcafe.hlp','Applet_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button API,JI('APIRef.hlp','java.applet.Applet.html')}
```

### Description

An applet is the parent container that holds all components comprising an applet's GUI.

Use an Applet container to create an applet program.

Build an applet in Visual Cafe by choosing the Basic Applet icon displayed in the New Project window. Then to create the applet's GUI interface, drag the visual components you want from the Palette onto the Form Designer window attached to that applet project.

Applets support the following functionality:

- Applet programs are run by another program.
- Applet components include some built-in support for [threads](#). (For simple applets, you do not need to consider how your applet will handle threads.)
- Applets contain [methods](#) which manage sounds, pictures, and URL addresses.
- Applet programs can write to files only if the applets are located on the host system of the managing Web page. An applet can not write a file over a network.

Your applet can send and receive [events](#). Use the Interaction Wizard to post predefined events between your Applet container and the components it contains.

An applet program is a self-contained block of running Java code that a Web browser launches and runs from a Web page. Applets are called using the HTML `</Applet>` tag. To display an applet on a Web page, use an HTML file containing a reference to your applet. In HTML, a simple applet tag looks like this:

```
<APPLET CODE="Applet1.class" WIDTH=100 HEIGHT=100></APPLET>
```

**Tip:** An applet does not have menus, but a [Frame component](#) that is invoked from an applet *can* have menus.

### Properties

You can change the layout manager using the [Layout property](#).

## Applet Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Layout](#)

[Name](#)

[Visible](#)



## AttentionDialog component

```
{button Properties,PI(`vcafe.hlp`,`Common_Dialog_Properties`)} {button Events,PI(`vcafe.hlp`,`Events_Summary`)} {button Example,JI(`vcafe.hlp`,`Example_AttentionDialog`)}
```

### Description

Creates a pop-up window that displays a message. Place an AttentionDialog container into a Window, Frame or Applet container.

Use AttentionDialog to display a program message requiring immediate attention. AttentionDialog windows are modal.

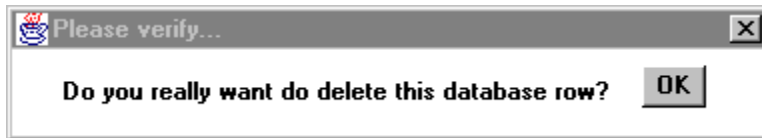
### Properties

To set the dialog box window title, use the [Title property](#) .

AttentionDialog provides layout managers, which you can choose by using the [Layout property](#).

### Example

This example is a slightly customized AttentionDialog. The interaction that was created with the Interaction Wizard to display this dialog specifies the text string for the label to the left of the OK button. The component was also resized for the label length.



## BorderPanel component

```
{button Properties,PI('vcafe.hlp','BorderPanel_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_BorderPanel')} {button API,JI('APIRef.hlp','symantec.itools.awt.BorderPanel.html')}
```

### Description

Creates a container with a border, that holds visual components and other panels.

Use `BorderPanel` to display a decorative border and specifically to

- create a labelled subcontainer that organizes container space within an `Applet`, `Frame` or `Dialog` container. This simplifies your component layout task.
- hold other specialized `Panel` containers.

### Properties

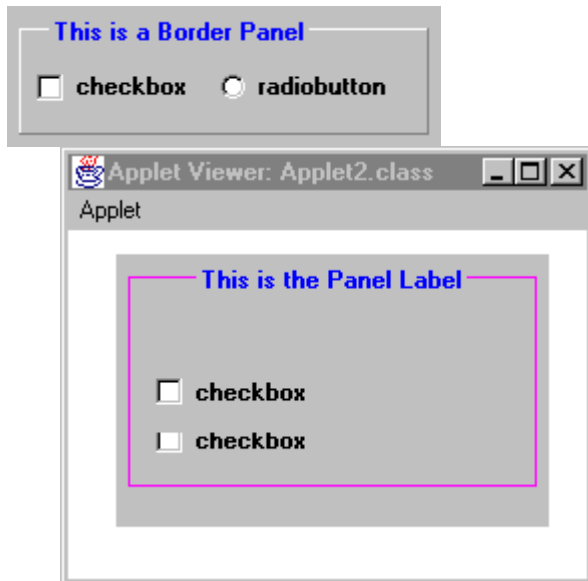
`BorderPanel` provides layout managers, which you can choose by using the [Layout property](#).

Use the [Border Color property](#) to set the color of the panel's border.

### Example

The first example is a `BorderPanel` with a light gray Background, blue Label Color, Label Alignment of `ALIGN_LEFT`, a `FlowLayout`, and `BEVEL_RAISED` Style.

The second screen shot is a panel with light gray Background, blue Label Color, Label Alignment `ALIGN_CENTER`, Padding Bottom 20, Style of `BEVEL_LINE`, and magenta Border Color.



## **BorderPanel Properties**

[Background](#)

[Border Color](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Inset Padding Bottom](#)

[Inset Padding Sides](#)

[Inset Padding Top](#)

[Label](#)

[Label Alignment](#)

[Label Color](#)

[Layout](#)

[Name](#)

[Padding Bottom](#)

[Padding Left](#)

[Padding Right](#)

[Padding Top](#)

[Style](#)

[Visible](#)

## Button component

```
{button Properties,PI('vcafe.hlp','Button_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button Example,JI('vcafe.hlp','Example_Button')} {button API,JI('APIRef.hlp','java.awt.Button.html')}
```

### Description

Creates a simple button that initiates an action. A button usually displays a text label. The Button component is a standard Java awt component. A [LabelButton component](#) is a Symantec component that has additional features, such as a [Bevel Style property](#) for 3D appearance, and an [Alignment Style property](#) for flexible button label alignment.

Use a Button to:

- accept or yield focus. Buttons accept and yield focus automatically by default.
- respond to a user event. Buttons accept clicked events automatically by default.
- send an action event to another visual component. To send an action event to another component, use the Interaction Wizard. Optionally, you can register an event listener with the button in project source code.

A button appears outlined when it possesses input focus. This indicates that it can receive a user event. When the user presses the button it get redrawn so that it appears depressed. When the user then releases the mouse button while still over the button component, a click event is generated.

Visual Cafe also provides the specialized button components listed below. These buttons can generate repeated action event signals as long as they detect a MouseDown event.

[DirectionButton](#)

[InvisibleButton](#)

[ImageButton](#)

[LabelButton](#)

[RollOverButton](#)

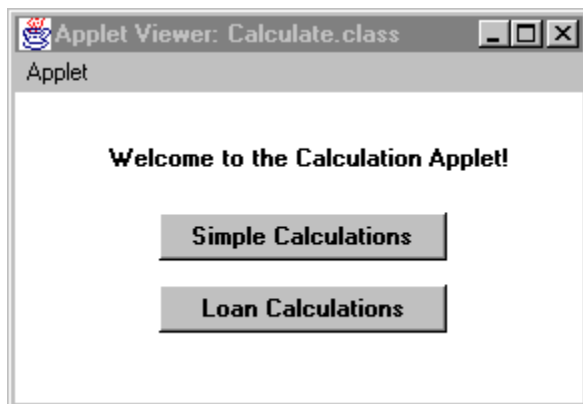
### Properties

To specify text for the label, use the [Label property](#) .

When a button is disabled, it is 'grayed out.' This indicates that it can not receive user input. Set the enable state using the [Enabled property](#) .

### Example

These are Button components at runtime.



## Button Properties

[Action Command](#)

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Label](#)

[Name](#)

[Visible](#)

## Calendar component

```
{button Properties,PI('vcafe.hlp','Calendar_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_Calendar')} {button API,JI('APIRef.hlp','symantec.itools.awt.util.Calendar.html')}
```

### Description

A calendar that displays a month at a time.

Displays a calendar with text boxes. These text boxes have up and down arrows and contain a list of years ([NumericSpinner component](#)) and a list of the months in the year ([MonthSpinner component](#)). At run time, the calendar displays with the selected date text as grayed out.

The Calendar component sends an action event when the user clicks on a date or changes the date.

You can use the Interaction Wizard to reset Calendar properties and to enable/disable and show/hide the component.

### Properties

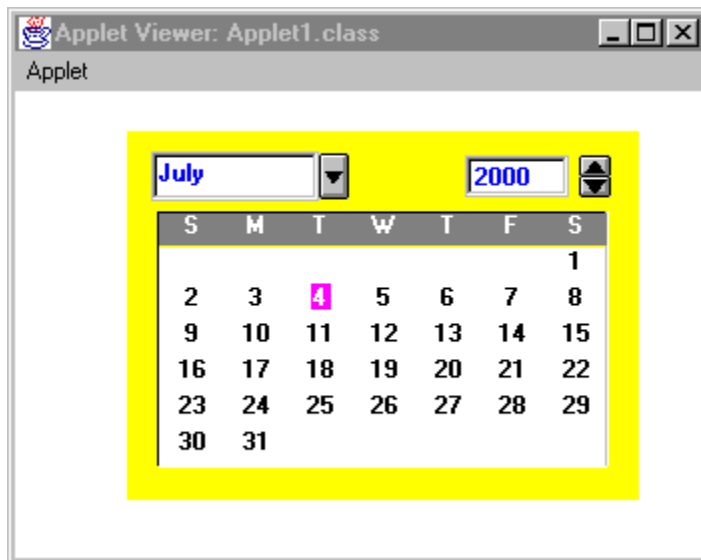
To specify a start date, use the [Date property](#) . The string accepts many date syntaxes; including the IETF standard date syntax: "Sat, 12 Aug 1995 13:30:00 GMT"

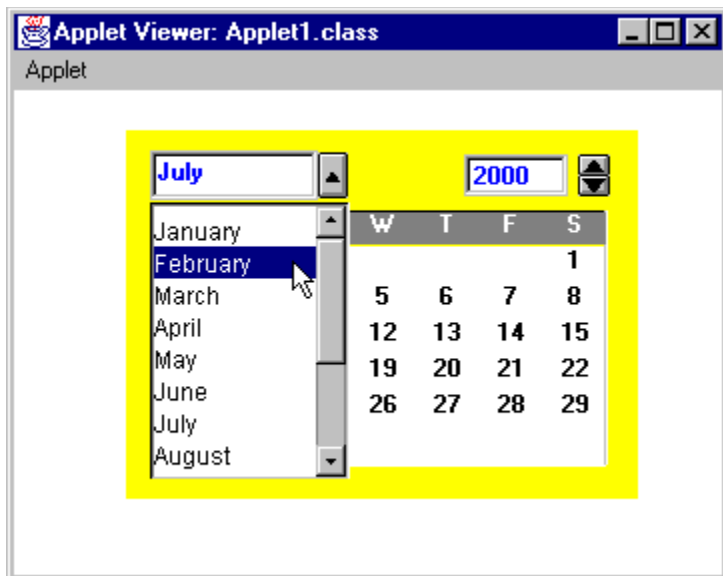
To set the color of the text in the month and year text field, use the [Foreground property](#) .

To set the color of the selected/highlighted date on the calendar, use the [Selection Color property](#) .

### Example

The first screen shot shows the Calendar component with Foreground property set to Blue, Selection Color property set to Magenta, and Background property set to Yellow. The second screen shot shows the dropdown list for month selection.





## Calendar Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Date](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[Selection Color](#)

[Visible](#)



## Canvas component

```
{button Properties,PI('vcafe.hlp','Canvas__Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button API,JI('APIRef.hlp','java.awt.Canvas.html')}
```

### Description

Canvas provides the visual component interface for a graphics object, so your GUI can size, position, show, hide, draw, and redraw that object, and respond to user events.

Visual Cafe provides many specialized Canvas components for programming convenience. These specialized components provide predefined Paint and Events methods and do not have to be subclassed.

Visual Cafe provides the following Canvas subclasses:

|                                  |                                 |                                   |
|----------------------------------|---------------------------------|-----------------------------------|
| <a href="#">Animator</a>         | <a href="#">Circle</a>          | <a href="#">DirectionButton</a>   |
| <a href="#">Ellipse</a>          | <a href="#">Firework</a>        | <a href="#">HorizontalLine</a>    |
| <a href="#">HorizontalSlider</a> | <a href="#">ImageButton</a>     | <a href="#">ImageHTMLLink</a>     |
| <a href="#">ImageViewer</a>      | <a href="#">InvisibleButton</a> | <a href="#">InvisibleHTMLLink</a> |
| <a href="#">Label3D</a>          | <a href="#">LabelButton</a>     | <a href="#">LabelHTMLLink</a>     |
| <a href="#">MovingAnimation</a>  | <a href="#">Nervous_Text</a>    | <a href="#">Plasma</a>            |
| <a href="#">ProgressBar</a>      | <a href="#">Rect</a>            | <a href="#">ScrollingText</a>     |
| <a href="#">Square</a>           | <a href="#">StateCheckBox</a>   | <a href="#">ToolBarSpacer</a>     |
| <a href="#">VerticalLine</a>     | <a href="#">VerticalSlider</a>  | <a href="#">WrappingLabel</a>     |

You must override Canvas methods to receive and send user events, to draw corresponding objects on the Canvas component, and redraw the Canvas when it changes.

To use Canvas in your project, write this project code:

1. Subclass Canvas, and add the subclass to your container.
2. Override the Canvas [paint](#) method. Draw your component using the Graphics object parameter.
3. Write and register listeners for the desired events. This can be done by selecting your new Canvas subclass in the Project window and using the Interaction Wizard.

## Canvas Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[Visible](#)

## CheckboxMenuItem component

```
{button Properties,PI('vcafe.hlp','CheckboxMenuItem_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button Example,JI('vcafe.hlp','Example_CheckboxMenuItem')} {button API,JI('APIRef.hlp','java.awt.CheckboxMenuItem.html')}
```

### Description

Creates a check box that can be included in a menu. Clicking the associated menu item toggles its state between checked (marked with a check mark) and unchecked.

Use `CheckboxMenuItem` whenever you include a menu item that you want to toggle between on and off.

Use the Interaction Wizard to trigger an action when the `CheckboxMenuItem` is checked or unchecked.

### Properties

Use the [Checkbox property](#) to set the initial menu state, either checked or unchecked.

The [Label property](#) sets the menu item text.

### Coding the component

Use the [setState](#) method to check or uncheck a menu item.

The Java language does not require you to create a variable to reference a menu item. Instead, you can refer to the menu item by its label.

In project source code, use this syntax to create a new `CheckboxMenuItem`:

```
menuItem1 = new java.awt.CheckboxMenuItem(label);
```

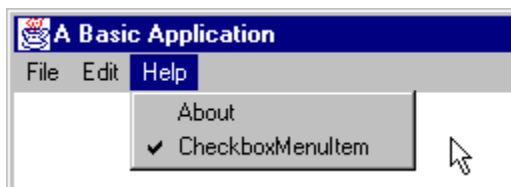
To add a check box menu item to an existing menu, call the menu component's `add` method:

```
menu1.add( new java.awt.CheckboxMenuItem(label) );
```

| Part      | Type             | Description                                                                    |
|-----------|------------------|--------------------------------------------------------------------------------|
| menuItem1 | CheckboxMenuItem | The variable name used to refer to the component in code.                      |
| label     | String           | The label for the check box menu item, or null for an unlabeled menu item.     |
| menu1     | Menu             | The variable name of the menu component to which you are adding the menu item. |

### Example

This example shows a single `CheckboxMenuItem` that is activated at runtime.



## CheckboxMenuItem Properties

[Checkbox](#)

[Class](#)

[Enabled](#)

[Label](#)

[Menu.Shortcut](#)

[Name](#)

[Separator](#)

## Choice component

```
{button Properties,PI('vcafe.hlp','Choice_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_Choice')} {button API,JI('APIRef.hlp','java.awt.Choice.html')}
```

### Description

A text box with a descriptive label and a button. Clicking on the button displays a drop down list of choices, which are mutually exclusive.

In Visual Cafe, a Choice is a ComboBox without scrollbars. This component is non-editable. Use a [ComboBox component](#) to provide editable properties.

Use a Choice component to:

- specify that your user can select only one choice from a list of choices.
- issue an action event to another component when the user clicks on a choice.

Use the Interaction Wizard to trigger an action when a Choice item is selected.

### Properties

Specify the contents of the choice list by using the [Items property](#). To include more than one item in the list, press CTRL+ENTER (on PCs) or RETURN (on Macs) after typing each item. By default, the first item added to the choice menu becomes the selected item. To make a different item become the selected item, you can change the [Selected Index property](#).

### Coding the component

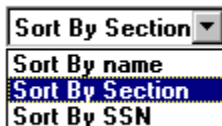
To create a new Choice containing no text labels in project source code, use this syntax:

```
choice1 = new java.awt.Choice();
```

| Part    | Type   | Description                                               |
|---------|--------|-----------------------------------------------------------|
| choice1 | Choice | The variable name used to refer to the component in code. |

### Example

This example shows a Choice component with three elements.



## Choice Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Items](#)

[Name](#)

[Selected Index](#)

[Visible](#)

## Circle component

```
{button Properties,PI('vcafe.hlp','Shape_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_Circle')} {button API,JI('APIRef.hlp','symantec.itools.awt.shape.Circle.html')}
```

### Description

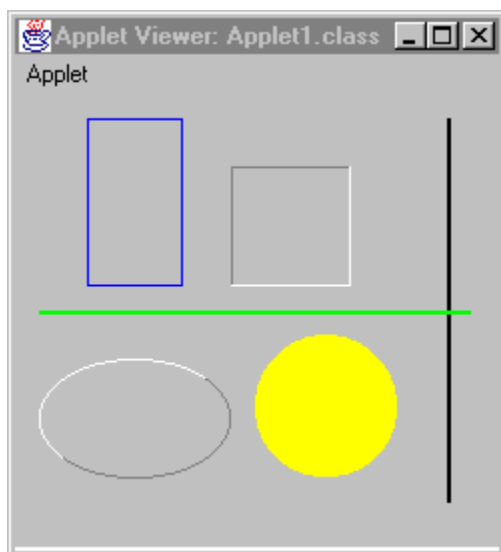
A simple circle. This component is provided for programming convenience, so that you don't have to draw the shape.

### Properties

Use the [Border\\_Style](#) , [Fill\\_Mode](#) , [Fill\\_Color](#) , [Background](#) , and [Foreground](#) properties to achieve the desired component look.

### Example

This screen shot shows six predefined Visual Cafe shapes; [Rect](#) , [Circle](#) , [Square](#) , [Ellipse](#) , [VerticalLine](#) , and [HorizontalLine](#) . The component use a variety of property settings to generate the different effects.



## Shape Properties

[Background](#)

[Border Style](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Fill Color](#)

[Fill Mode](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[Visible](#)



## DaySpinner component

```
{button Properties,PI('vcafe.hlp','Spinner2_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_DaySpinner')} {button API,JI('APIRef.hlp','symantec.itools.awt.util.spinner.DaySpinner.html')}
```

### Description

A text box that shows one day of the week, and has up and down arrows to the right that allow selecting any day of the week. Use this component to allow your user to select a day of the week.

At run time, only the selected value is displayed in the text box.

### Properties

Use the [Value property](#) to set the initial day of the week. 0 corresponds to Sunday, 1 to Monday, etc.

Use the [Maximum and Minimum properties](#) to set the maximum and minimum allowed day of the week. 0 corresponds to Sunday, 1 to Monday, etc.

### Example

This screen shot shows the four types of Visual Cafe spinner components. Each component has a label component under it. Various colors were chosen for the Foreground to display the colored text.



ListSpinner



NumericSpinner



DaySpinner



MonthSpinner

## Dialog component

```
{button Properties,PI('vcafe.hlp','Common_Dialog_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_Dialog')} {button API,JI('APIRef.hlp','java.awt.Dialog.html')}
```

### Description

A dialog box that can be shown and dismissed apart from its parent window. When you add a Dialog component to your project, a new Form Designer window opens. Add components to the Dialog by dragging components and containers to the Form Designer as necessary.

Dialog boxes are intended to be temporary window objects. They present specific timely information to your user, or they allow your user to set options for the current operation. A Dialog can be modal or non-modal. A modal Dialog receives all mouse, keyboard, and focus events that occur while it is open. The user must interact with a modal Dialog window and dismiss the window before returning to its parent window.

Use the Interaction Wizard to open a Dialog in response to an action such as a button press or a menu selection. The Interaction Wizard allows you to open the dialog as modal or non-modal.

Use Dialog to

- prompt the user for information or to make a decision.
- interrupt program processing until your user has provided information or read the message.
- display status on an activity taking place.

Dialog boxes commonly contain the following GUI elements: CheckBox, ComboBox, Button, Choice, BorderLayout, Label, List, Horizontal/Vertical Slider, Numeric/etc Spinner, TabPanel, TextField, TextArea, and more.

Dialogs are empty when created. You must add components, set properties and add interactions as necessary, to create functionality. For programming convenience, Visual Cafe provides the following predefined Dialog containers:

[AboutDialog](#)

[SaveFileDialog](#)

[AttentionDiaog](#)

[PasswordDialog](#)

[OpenFileDialog](#)

[ProgressDialog](#)

### Coding the component

To create a Dialog window in project source code, use this syntax:

```
dialog1 = new java.awt.Dialog(parent, title, modal);
```

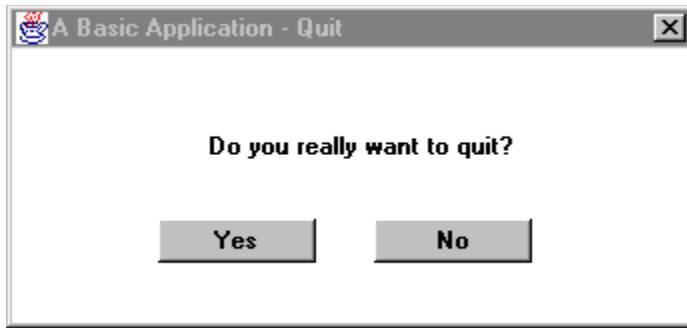
| Part           | Type    | Description                                                     |
|----------------|---------|-----------------------------------------------------------------|
| <i>dialog1</i> | Dialog  | The variable name used to refer to the component in code.       |
| <i>parent</i>  | Frame   | The main application window from which the Dialog can be shown. |
| <i>title</i>   | String  | The text to display in the dialog box's title bar.              |
| <i>modal</i>   | boolean | Whether the dialog is modal or not.                             |

The settings for *modal* are:

| Value | Description                                                                                            |
|-------|--------------------------------------------------------------------------------------------------------|
| true  | The dialog box blocks input to other windows. While it is visible dialog box retrieves all user input. |
| false | The dialog box is modeless. Other windows can be activated and used while the dialog box is open.      |

### Example

This Dialog component has been customized to act as an Exit verification dialog box. This Quit dialog box is provided for you automatically when you create a new project using the Basic Application template.



## DirectionButton component

```
{button Properties,PI('vcafe.hlp','DirectionButton_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_DirectionButton')} {button API,JI('APIRef.hlp','symantec.itools.awt.DirectionButton.html')}
```

### Description

An arrow button. At runtime, the button has a raised look when not pressed and a lowered look when pressed.

This component is usually used in conjunction with a combo or list box to indicate a list that the user can view by clicking the arrow.

Use the Interaction Wizard to trigger an action when this button is pressed.

### Properties

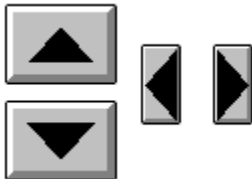
To set the direction of the arrow, use the [Direction property](#).

To define the margin between the arrow and the button sides, use the [Arrow Indent property](#). Type a new value in pixels.

To send a continuous stream of action events when the button is clicked, set the [Notify While Pressed property](#) to "true", and specify a [Notify Delay property](#) value in milliseconds.

### Example

In the this screen shot, there are four DirectionButtons. The left and right arrow buttons show the default bevel style and arrow look. The up and down arrow buttons have a Bevel Height of 3 and an Arrow Indent of 5.



## **DirectionButton Properties**

[Arrow Color](#)

[Arrow Indent](#)

[Bevel Height](#)

[Border Color](#)

[Bounds](#)

[Button Color](#)

[Class](#)

[Cursor](#)

[Direction](#)

[Enabled](#)

[Frame Name](#)

[HTML Link URL](#)

[Name](#)

[Notify Delay](#)

[Notify While Pressed](#)

[Show Focus](#)

[Show Link URL Status](#)

[Use Offset](#)

[Visible](#)



## Ellipse component

```
{button Properties,PI('vcafe.hlp','Shape_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_Ellipse')} {button API,JI('APIRef.hlp','symantec.itools.awt.shape.Ellipse.html')}
```

### Description

An ellipse. This component is provided for programming convenience, so that you don't have to draw the shape.

### Properties

Use the [Border\\_Style](#) , [Fill\\_Mode](#) , [Fill\\_Color](#) , [Background](#) , and [Foreground](#) properties to achieve the desired component look.

### Example

This screen shot shows six predefined Visual Cafe shapes; [Rect](#) , [Circle](#) , [Square](#) , [Ellipse](#) , [VerticalLine](#) , and [HorizontalLine](#) . The component use a variety of property settings to generate the different effects.



## Emblaze20 component

```
{button Properties,PI('vcafe.hlp','Emblaze20_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_Eemblaze20')} {button API,JI('APIRef.hlp','geo.Emblaze20.html')}
```

### Description

Creates a box that displays a Emblaze animation file (.BLZ.).

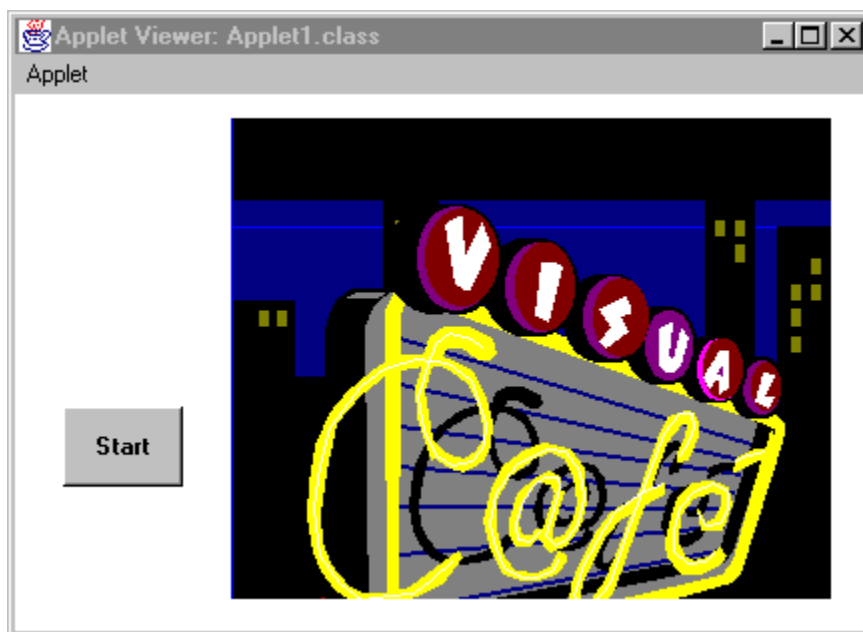
To run the animation, create a button and then use the Interaction Wizard to connect the button to the Emblaze20 component. Select the button trigger action as clicked and the Emblaze action as Start the animation. This connection sends the start method to the Emblaze component when the button is clicked at runtime.

### Properties

To add a Emblaze animation file, double-click on the [URL property](#) to open the URL selection dialog box and specify a .BLZ file.

### Example

This screen shot shows the Emblaze file that is shipped in the Sample directory running in an applet. The button starts the animation.



## Emblaze20 Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[URL](#)

[Visible](#)



## Firework component

```
{button Properties,PI('vcafe.hlp','Firework_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_Firework')} {button API,JI('APIRef.hlp','symantec.itools.multimedia.Firework.html')}
```

### Description

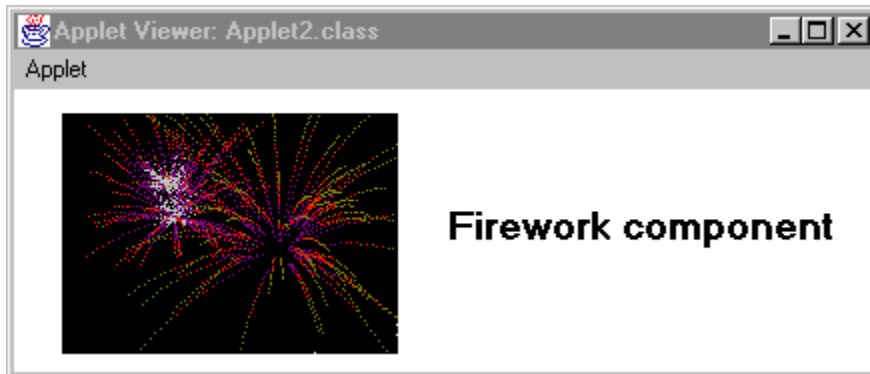
An animated fireworks image. This multimedia component is provided for novelty and programming convenience.

### Properties

There are no properties to control the speed or display of the Firework image.

### Example

The following is a simple example of the Firework component. See the Sample directory for another example.



## Firework Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[Visible](#)

## Frame component

```
{button Properties,PI('vcafe.hlp','Frame_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button  
API,JI('APIRef.hlp','java.awt.Frame.html')}
```

### Description

A frame is a top-level window that supports a title bar and menu bar. Visual Cafe uses the frame component to build applications. Frames cannot be placed inside another component.

**Note:** You must place a Window component into a Frame. Also, a Dialog component can be placed into a Frame, while an Applet cannot.

Use a frame whenever you need to:

- build a GUI for an application. Frame is the parent container for application GUIs.
- build a container that supports a menu bar.

To create a Frame, select File ► New Project and choose Basic Application project. Visual Cafe automatically provides a Frame and a main method, and updates both Frame methods, and property and event defaults as necessary.

You can also drag a Frame from the Palette to the Form Designer window, or from the Component Library to the Project window. Adding a Frame from the Palette or the Component Library may require you to provide a `main` method and override other Frame methods manually.

To add a [MenuBar component](#) to a Frame, drag the MenuBar icon to the Form Designer window.

When a Frame is active, it receives all mouse, keyboard, and focus events that occur over it.

## Frame Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Layout](#)

[Name](#)

[Resizable](#)

[Title](#)

[Visible](#)



## HorizontalLine component

```
{button Properties,PI('vcafe.hlp','Shape_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_HorizontalLine')} {button API,JI('APIRef.hlp','symantec.itools.awt.shape.HorizontalLine.html')}
```

### Description

A horizontal line. This component is provided for programming convenience, so that you don't have to draw the shape.

### Properties

Use the [Border\\_Style](#) , [Fill\\_Mode](#) , [Fill\\_Color](#) , [Background](#) , and [Foreground](#) properties to achieve the desired component look.

### Example

This screen shot shows six predefined Visual Cafe shapes; [Rect](#) , [Circle](#) , [Square](#) , [Ellipse](#) , [VerticalLine](#) , and [HorizontalLine](#) . The component use a variety of property settings to generate the different effects.



## Horizontal and Vertical Scrollbar components

```
{button Properties,PI('vcafe.hlp','Scrollbar_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button API,JI('APIRef.hlp','java.awt.Scrollbar.html')}
```

### Description

Scrollbar components preset to display left-to-right and up-down respectively.

A scrollbar is a component used when the contents of a window or box takes up more space than is allocated to that window or box. This, for example, commonly occurs when a large amount of text is displayed in a window. The scrollbar indicates three things. The total length of the contents (corresponding to the length of the scrollbar). The location of the contents shown in the window (corresponding to the position of the scrollbar thumb). And the amount of the contents shown in the window (corresponding to the length of the scrollbar thumb). A different part of the contents may be shown in the window by moving the scrollbar's thumb. The thumb can be moved by dragging, clicking an arrow button, or by clicking between the thumb and an arrow.

Use a ScrollBar to:

- scroll through a data buffer that is too large to display in an associated view window.
- respond to a user event.
- send an action event to another visual component.

Use the Interaction Wizard to trigger an action when the scrollbar's value has changed. A typical event might be painting the appropriate part of the data a window is displaying into that window, thus making the scrollbar "scroll" the data in the window.

### Properties

To change the orientation of a ScrollBar, set the [Orientation property](#) to VERTICAL or HORIZONTAL. **Note:** HorizontalScrollbar and VerticalScrollbar differ only in the default value of this property. They are actually both components of type `java.awt.Scrollbar`.

To set the location of the scroll thumb in the scroll bar, set the scroll bar's [Value property](#). The [Minimum](#) and [Maximum](#) properties set the range of values the scrollbar may have.

In code, you can move the scroll thumb to it's minimum position by calling the [setValue](#) method for the scrollbar and use the [Minimum property](#) setting as the parameter.

### Coding the component

The three examples below instantiate a scrollbar in project source code:

```
scrollbar1 = new java.awt.Scrollbar(orientation, value, visible, minimum, maximum);
```

| Part                     | Type      | Description                                                                                                                                                           |
|--------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>scrollbar1</code>  | Scrollbar | The variable name used to reference the component in code.                                                                                                            |
| <code>orientation</code> | int       | An integer value indicating the orientation of the scroll bar, VERTICAL or HORIZONTAL.                                                                                |
| <code>value</code>       | int       | The initial value of the scroll bar. This parameter controls the starting location of the scroll thumb. This number should be between the minimum and maximum values. |
| <code>visible</code>     | int       | The size represented by the thumb of the scrollbar. The scroll bar uses this value when paging up or down by a page.                                                  |
| <code>minimum</code>     | int       | The minimum value of the scrollbar, when the scroll thumb is in the top or leftmost position.                                                                         |
| <code>maximum</code>     | int       | The maximum value of the scrollbar, when the scroll thumb is in the bottom or rightmost position.                                                                     |

## Scrollbar Properties

[Background](#)

[Block Increment](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Maximum](#)

[Minimum](#)

[Name](#)

[Orientation](#)

[Unit Increment](#)

[Value](#)

[Visible](#)

[Visible Amount](#)

## HorizontalSlider and VerticalSlider components

```
{button Properties,PI('vcafe.hlp','Slider_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button Example,JI('vcafe.hlp','Example_HorizontalSlider')} {button API (h),JI('APIRef.hlp','symantec.itools.awt.HorizontalSlider.html')} {button API (v),JI('APIRef.hlp','symantec.itools.awt.VerticalSlider.html')}
```

### Description

A horizontal or vertical slider component.

A slider is used to select one value from a continuous range of values. It has a movable thumb in front of a gauge with ticks marks on it.

### Properties

To specify the range of values that the slider indicates, change the [Min Value property](#) and the [Max Value property](#).

To change the number of tick marks on the slider, set the [Tick Frequency property](#).

Use the [Value property](#) to set the initial value of the slider.

### Example

This HorizontalSlider component has a Tick Style of Both and a light gray Background.





## Slider Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Max Value](#)

[Min Value](#)

[Name](#)

[Show Border](#)

[Tick Frequency](#)

[Tick Style](#)

[Value](#)

[Visible](#)

## ImageButton component

```
{button Properties,PI('vcafe.hlp','ImageButton_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button Example,JI('vcafe.hlp','Example_ImageButton')} {button API,JI('APIRef.hlp','symantec.itools.awt.ImageButton.html')}
```

### Description

A button that displays an image on its face instead of a text label.

Use an ImageButton to:

- display an image instead of text on a button.
- generate a continuous series of action events when the user clicks the button.

### Properties

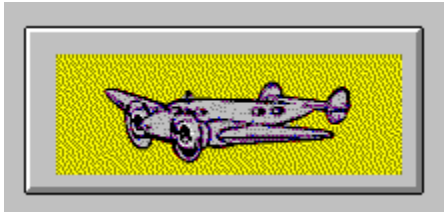
To select and display an image on the button, use the [Image URL property](#). Specify a file name for the JPEG or GIF image you want displayed. Then, if desired, scale the image to fit in the button by using the [Image Style property](#).

To send a continuous series of action events when the button is clicked, set the [Notify While Pressed property](#) to “true”, and specify a [Notify Delay property](#) value in milliseconds.

Use the Interaction Wizard to trigger some action when the button is pressed.

### Example

This ImageButton example has a Bevel Height of 3, Image Style is IMAGE\_CENTERED, and Background property is set to light gray. The button's container's Background property is also gray.



## **ImageButton Properties**

[Bevel Height](#)

[Border Color](#)

[Bounds](#)

[Button Color](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Frame Name](#)

[HTML Link URL](#)

[Image Style](#)

[Image URL](#)

[Name](#)

[Notify Delay](#)

[Notify While Pressed](#)

[Show Focus](#)

[Show Link URL Status](#)

[Use Offset](#)

[Visible](#)

## ImageHTMLLink component

```
{button Properties,PI(`vcafe.hlp`,`ImageHTMLLink_Properties`)} {button Events,PI(`vcafe.hlp`,`Events_Summary`)} {button API,JI(`APIRef.hlp`,`symantec.itools.awt.ImageHTMLLink.html`)}
```

### Description

Creates a rectangular button, with an image label, that calls a URL address when clicked.

Specifically, use ImageHTMLLink to:

- go to an HTML page when the button is clicked.
- display an image on a button.
- generate a continuous series of action events when the user clicks the button.

Use the Interaction Wizard to trigger an action when this button is clicked.

**Note:** This component can only show HTML files if your program is running in a browser.

### Properties

To select and display an image on the button:

1. Using the [Image URL](#), specify the file name of the JPEG or GIF image you want displayed.
2. Scale the image to fit in the button, as desired, by using the [Image Style](#) property.
3. Set the [HTML Link URL](#) to the URL that you want displayed when the button is clicked.

To send a continuous series of action events when the button is clicked, set the [Notify While Pressed property](#) to True, and then specify a [Notify Delay property](#) value in milliseconds.

## ImageHTMLLink Properties

[Bevel Height](#)

[Border Color](#)

[Bounds](#)

[Button Color](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Frame Name](#)

[HTML Link URL](#)

[Image Style](#)

[Image URL](#)

[Name](#)

[Notify Delay](#)

[Notify While Pressed](#)

[Show Focus](#)

[Show Link URL Status](#)

[Use Offset](#)

[Visible](#)

## ImageListBox component

```
{button Properties,PI('vcafe.hlp','ImageListBox_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_ImageListBox')} {button API,JI('APIRef.hlp','symantec.itools.awt.ImageListBox.html')}
```

### Description

A box containing a list of images and text.

Use an ImageListBox to display a set of images and text that the user can select. Text may be added to the ImageListBox using the Property window or Interaction Wizard. Images and images with text must be added via program code. Use the [addItem](#) method of the ImageListBox component to add images.

### Properties

Use the [ComboBox\\_Mode\\_property](#) to change the highlight action of the ImageListBox. When ComboBox Mode is true list selections will be highlighted anytime the mouse cursor is over them. When false, the normal ListBox highlight is used.

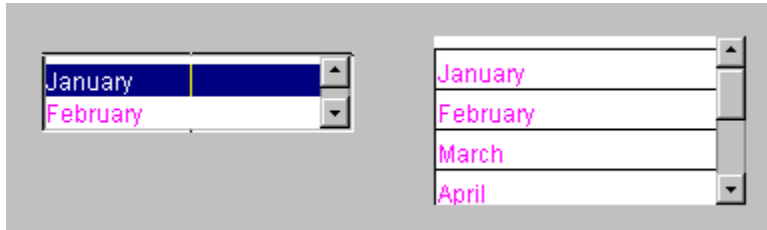
The [Enabled\\_property](#) effects the entire ImageListBox component. Individual list items may be enabled and disabled in program code using the [setEnabled](#) method.

Use the [Rows\\_to\\_Display\\_property](#) to determine the minimum number of rows to display when this component is automatically laid out. This affects the dimensions returned by [getPreferredSize](#) and [getMinimumSize](#).

### Example

This screen shot shows an ImageListBox component (left) and an [ImageViewer\\_component](#) (right, under Preview).

This next picture shows an ImageListBox component with no images (on the left). This component has Display Cell Borders set to False and Border Style set to BORDER\_REGULAR. The ImageListBox component on the right has Display Cell Borders set to True and Border Style set to BORDER\_NONE. Both components have the same set of values in the List Items property.



## ImageListBox Properties

[Background](#)

[Border Style](#)

[Bounds](#)

[Class](#)

[Columns to Display](#)

[ComboBox Mode](#)

[Cursor](#)

[Display Cell Borders](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[List Items](#)

[Multiple Selections](#)

[Name](#)

[Rows to Display](#)

[Show Horizontal Scrollbar](#)

[Show Vertical Scrollbar](#)

[Visible](#)



## ImagePanel component

```
{button Properties,PI(`vcafe.hlp`,`ImagePanel_Properties`)} {button Events,PI(`vcafe.hlp`,`Events_Summary`)} {button  
API,JI(`APIRef.hlp`,`symantec.itools.awt.ImagePanel.html`)}
```

### Description

The ImagePanel component is similar to a regular panel except that it displays an image within the panel. The image to use is specified with a URL.

### Properties

Use the [Image URL property](#) to specify the URL of the image to display.

Use the [Image Style property](#) to specify how to display the image.



## ImagePanel Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Image Style](#)

[Image URL](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Layout](#)

[Name](#)

[Visible](#)



## IntlLongDistPhoneNumber component

```
{button Properties,PI('vcafe.hlp','Predefined_TextField_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button API,JI('APIRef.hlp','symantec.itools.awt.util.edit.IntlLongDistPhoneNumber.html')}
```

### Description

A FormattedTextField in which your user can type text that is limited to an international phone number format (thirteen digit number). Text formatting logic is applied to the user input. If the text box already contains text, the user can select the default text and delete or edit it.

Use the Interaction Wizard to trigger an action when the value of this component is changed.

### Properties

The mask format is unchangeable, and set to 999/-999/-999/-9999. See: [Mask property](#).

Use the [Editable property](#) to prevent the user from being able to edit the number.

## InvisibleButton component

```
{button Properties,PI('vcafe.hlp','InvisibleButton_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_InvisibleButton')} {button API,JI('APIRef.hlp','symantec.itools.awt.InvisibleButton.html')}
```

### Description

An invisible area, usually within an image, that initiates an action when clicked. Specifically, use InvisibleButton to

- create a "hot spot" on an image or on a component
- accept or yield focus
- respond to a user event
- send an action event to another component

Button tips:

- Buttons accept and yield focus automatically by default.
- Buttons accept clicked events automatically by default.
- Use the Interaction Wizard to trigger an action when the button is clicked.

### Example

The following screen shot shows the SlideShow component that is used in the Visual Cafe Tutorial that ships with your release. The SlideShow component displays four package pictures, and an ImageViewer component displays the art work at the bottom that is used as the slide show controller. The SlideShow is "activated" by two InvisibleButtons on the slide controller ImageViewer component. One invisible button overlays the "previous" arrow and the other overlays the "next" arrow. The interactions between the buttons and SlideShow were created with the Interaction Wizard. The text to the right of SlideShow displays is a WrappingLabel component. An interaction is defined between the SlideShow and the WrappingLabel so that the text changes as each slide displays.

**Tip:** Overlapping components - browsers handle components layered on each other differently. In this SlideShow example, some browsers display/layer the InvisibleButtons on top of the ImageViewer component, while others displayed them underneath. Therefore, this example required two sets of InvisibleButtons, one set on top of ImageViewer and the other underneath.



**Hiking through the rainforest and touring botanical gardens are some of the many ways to explore the Bungbusi tropical paradise.**

*To see some highlights,  
take a look at the slide show...*



*...click forward to start.*

## InvisibleButton Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[Visible](#)

## InvisibleHTMLLink component

```
{button Properties,PI('vcafe.hlp','InvisibleHTMLLink_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button API,JI('APIRef.hlp','symantec.itools.awt.InvisibleHTMLLink.html')}
```

### Description

An invisible rectangular button, usually within an image, that links to a URL address when clicked. Specifically, use InvisibleHTMLLink to:

- Show an HTML document when clicked on.
- Accept or yield focus.
- Respond to a user event.
- Send an action event to another component.

Button tips:

- Buttons accept and yield focus automatically by default.
- Buttons accept clicked events automatically by default.
- Use the Interaction Wizard to trigger an action when the button is clicked.

**Note:** This component will only access HTML links when it is running within a Java enabled browser.

### Properties

Use the [HTML Link URL property](#) to specify the address that the browser should access when this link is clicked.

Use the [Frame Name property](#) to specify how the linked document will be displayed.

## InvisibleHTMLLink Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Frame Name](#)

[HTML Link URL](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[Visible](#)

## KeyPressManagerPanel component

```
{button Properties,PI('vcafe.hlp','KeyPressManagerPanel_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')}  
{button API,JI('APIRef.hlp','symantec.itools.awt.KeyPressManagerPanel.html')}
```

### Description

A container which holds visual components and other panels that the user can TAB through to change focus. You can also use this component to set default buttons (for when the user presses the ENTER key), and to handle OK and CANCEL buttons automatically.

The tab focus order is based on the order in which the components were added to the KeyPressManagerPanel. Each component receives focus in turn, but the mouse cursor is not relocated. Look at the Project window to see the tab order of components within the KeyPressManagerPanel. You can change the tab order by moving the component names in the Project window list.

Tabbing from the last component in the panel changes focus back to the first component. To make the focus leave the KeyPressManagerPanel and continue to the next traversable component in the application, use CTRL+TAB.

Components respond to default events when they receive focus. For example, the TextField component displays text input from the keyboard, and the Button component issues an action event when it is clicked.

Use KeyPressManagerPanel to create a panel whose elements can be tabbed through, and specifically to:

- create a subcontainer that organizes container space within an Applet, Frame or Dialog container. This simplifies your component layout task.
- hold other specialized Panel containers.

### Properties

If desired, use the [Layout property](#) to select a layout manager for this container.

## KeyPressManagerPanel Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Layout](#)

[Name](#)

[Visible](#)



## Label3D component

```
{button Properties,PI('vcafe.hlp','Label3D_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_Label3D')} {button API,JI('APIRef.hlp','symantec.itools.awt.Label3D.html')}
```

### Description

A text string in a rectangle with a three-dimensional visual effect. It is usually attached to an option, box, or button.

An application or applet can change the label text string, but a user cannot edit it. Use the [setText](#) method at runtime to change a label's text.

**Note:** For most components, labels are usually created by specifying text for the Label property of that component.

### Properties

To specify the label text, type the text in the [Text property](#) field on the Property List window.

You can also specify text alignment, font, color, bevel style, border color and border indent using properties in the Property List window.

### Example

This set of Label3D components show Bevel Styles - Lowered, Raised, Line, and None - and different Alignment Styles. The Border Color in the label with the Line bevel style is blue. Each component has a Border Indent of INDENT\_TWO.



## **Label3D Properties**

[Alignment Style](#)

[Background](#)

[Bevel Style](#)

[Border Color](#)

[Border Indent](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[Text](#)

[Text Color](#)

[Visible](#)

## LabelButton component

```
{button Properties,PI('vcafe.hlp','LabelButton_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_labelButton')} {button API,JI('APIRef.hlp','symantec.itools.awt.LabelButton.html')}
```

### Description

A button that has a 3D appearance and whose text can be aligned left, center, or right. In addition, the button can generate a continuous stream of action events while pressed.

A LabelButton appears outlined when it possesses input focus. This indicates that the component can receive a user event. When the user presses the button it get redrawn so that it appears depressed. When the user then releases the mouse button while still over the button component, a click event is generated.

When a LabelButton is disabled, it is 'grayed out.' This indicates that it can not receive user input.

The button accepts clicked events automatically by default.

Use a LabelButton to:

- Accept or yield focus.
- Respond to a user event.
- Send a train of action events to another component.

Use the Interaction Wizard to trigger an action when the button is clicked.

### Properties

To specify the label text, use the [Text property](#).

To specify the label text alignment, use the [Alignment Style property](#).

To specify the 3D appearance, use the [Bevel Height property](#).

The text string accepts and yields focus automatically by default. To prevent the component from accepting focus, use the [Enabled property](#).

To send a continuous series of action events when the button is clicked, set the [Notify While Pressed](#) property to True, and use the [Notify Delay](#) property to specify a value in milliseconds.

### Properties

To specify the label text, type the text in the [Text property](#).

To specify the destination URL, double-click the [HTML Link URL property](#) and select the target file.

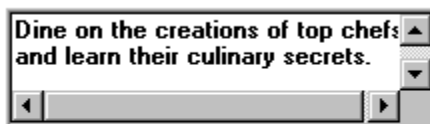
Use the [Show Link URL Status property](#) to determine whether the link URL will be displayed in the status area when the mouse is over the button.

To specify the label text alignment, use the [Alignment Style property](#).

### Example

This screen shot includes a LabelButton (Next). The label has a magenta text color.

#### Description



Set as default

## **LabelButton Properties**

[Alignment Style](#)

[Bevel Height](#)

[Border Color](#)

[Bounds](#)

[Button Color](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Frame Name](#)

[HTML Link URL](#)

[Inherit Font](#)

[Name](#)

[Notify Delay](#)

[Notify While Pressed](#)

[Show Focus](#)

[Show Link URL Status](#)

[Text](#)

[Text Color](#)

[Use Offset](#)

[Vertical Alignment Style](#)

[Visible](#)



## LabelHTMLLink component

```
{button Properties,PI('vcafe.hlp','LabelHTMLLink_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button  
API,JI('APIRef.hlp','symantec.itools.awt.LabelHTMLLink.html')}
```

### Description

Creates a button with a text label that displays the document at a URL address when clicked. This component only works from within a Java enabled browser. An applet can change the label text string, but a user cannot edit it.

Use LabelHTMLLink whenever you want to create "hot" text, that links to a URL address when clicked.

### Properties

To specify the label text, type the text in the [Text property](#).

To specify the destination URL, double-click the [HTML\\_Link\\_URL property](#) and select the target file.

## **LabelHTMLLink Properties**

[Alignment Style](#)

[Bevel Height](#)

[Border Color](#)

[Bounds](#)

[Button Color](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Frame Name](#)

[HTML Link URL](#)

[Inherit Font](#)

[Name](#)

[Notify Delay](#)

[Notify While Pressed](#)

[Show Focus](#)

[Show Link URL Status](#)

[Text](#)

[Text Color](#)

[Use Offset](#)

[Vertical Alignment Style](#)

[Visible](#)



## Line component

```
{button Properties,PI('vcafe.hlp','Line_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button  
API,JI('APIRef.hlp','symantec.itools.awt.shape.Line.html')}
```

### Description

A line with variable thickness. This component is provided for programming convenience, so that you don't have to draw the shape.

### Properties

Use the [Line Thickness](#) property to vary the width of the line.

Use the [Positive Slope](#) and the [Bounds](#) properties to specify the line endpoints.

## Line Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Line Thickness](#)

[Name](#)

[Positive Slope](#)

[Visible](#)





## ListSpinner component

```
{button Properties,PI('vcafe.hlp','Spinner_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_ListSpinner')} {button API,JI('APIRef.hlp','symantec.itools.awt.util.spinner.ListSpinner.html')}
```

### Description

A text box that shows one of a list of items, and has up and down arrows to the right. Use this component to allow your users to move through a set of fixed values.

At run time, only the selected value is displayed in the text box.

### Properties

To add items to the list, use the [List Items property](#).

Use the [Orientation property](#) to determine whether spinner arrows are displayed one above the other (vertically) or side-by-side (horizontally).

### Example

This screen shot shows the four types of Visual Cafe spinner components. Each component has a label component under it. Various colors were chosen for the Foreground property to display the colored text.



## ListSpinner Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Dynamic Resizing](#)

[Editable](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[List Items](#)

[Maximum](#)

[Minimum](#)

[Name](#)

[Orientation](#)

[Value](#)

[Visible](#)

[Wrappable](#)

## LocalPhoneNumber component

```
{button Properties,PI('vcafe.hlp','Predefined_TextField_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button API,JI('APIRef.hlp','symantec.itools.awt.util.edit.LocalPhoneNumber.html')}
```

### Description

A FormattedTextField in which your user can type text that is limited to an local phone number format (seven digit number). Text formatting logic is applied to the user input. If the text box already contains text, the user can select the default text and delete or edit it.

Use the Interaction Wizard to trigger an action when the value of this component is changed.

### Properties

The mask format is unchangeable, and set to 999/-9999. See: [Mask property](#).

Use the [Editable property](#) to prevent the user from being able to edit the number.

## Predefined TextField Properties

[Background](#)

[Bounds](#)

[Class](#)

[Columns](#)

[Cursor](#)

[Editable](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Mask](#)

[Name](#)

[Text](#)

[Visible](#)



## LongZipCode component

```
{button Properties,PI('vcafe.hlp','Predefined_TextField_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button API,JI('APIRef.hlp','symantec.itools.awt.util.edit.LongZipCode.html')}
```

### Description

A FormattedTextField in which your user can type text that is limited to a long zip code format (nine digit number). Text formatting logic is applied to the user input. If the text box already contains text, the user can select the default text and delete or edit it.

Use the Interaction Wizard to trigger an action when the value of this component is changed.

### Properties

The mask format is unchangeable, and set to 99999/-9999. See: [Mask property](#).

Use the [Editable property](#) to prevent the user from being able to edit the number.

## Menu component

```
{button Properties,PI('vcafe.hlp','Menu_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button Example,JI('vcafe.hlp','Example_Menu')} {button API,JI('APIRef.hlp','java.awt.Menu.html')}
```

### Description

Use this component to create a drop-down menu containing a list of commands.

Menus must be placed within a [MenuBar component](#) . Only Frame components support MenuBars, Menus or MenuItems.

Visual Cafe provides a Menu Editor to help you create menus.

See: [Adding Menus to a Form](#)

### Properties

A menu can remain on the screen after the mouse button has been released by using the [Tear Off property](#).

### Coding the component

Each item in a menu must belong to the [MenuItem](#) class. This can be an instance of MenuItem, a submenu (an instance of Menu), or a check box (an instance of [CheckboxMenuItem](#)).

Create a new menu using the syntax below. You can create a menu with a specified label. Optionally, you can specify that the menu behave like a pop-up menu.:

```
menu1 = new java.awt.Menu(label, tearOff);
```

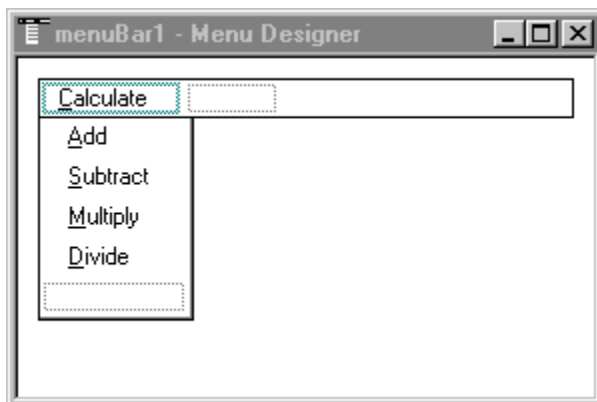
| Part    | Type    | Description                                                           |
|---------|---------|-----------------------------------------------------------------------|
| menu1   | Menu    | The variable name used to reference the component in code.            |
| Label   | String  | The text that displays in the menu on the menu bar.                   |
| tearOff | boolean | A setting that determines whether or not the menu is a tear-off menu. |

The settings for *tearOff* are listed below:

| Value | Description                                                                                        |
|-------|----------------------------------------------------------------------------------------------------|
| true  | The menu can be torn off. The menu remains on the screen after the mouse button has been released. |
| false | (Default.) The menu cannot be torn off.                                                            |

### Example

In this example of a menu being developed at design time, the element "Calculate" is the Menu component. See Also [MenuBar component](#).



## Menu Properties

[Class](#)

[Help.Menu](#)

[Label](#)

[Name](#)

[Tear.Off](#)

## MenuBar component

```
{button Properties,PI('vcafe.hlp','MenuBar_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button Example,JI('vcafe.hlp','Example_MenuBar')} {button API,JI('APIRef.hlp','java.awt.MenuBar.html')}
```

### Description

Creates a platform-specific horizontal bar containing a list of menus. Use MenuBar to group your menus within a horizontal bar.

Only Frame containers can accept MenuBar components. To display a menu bar in an application, add the MenuBar component to a Frame window.

See: [Adding Menus to a Form](#)

### Runtime modification

At run time, you can display a different menu bar by calling the Frame's [setMenuBar](#) method.

### Coding the component

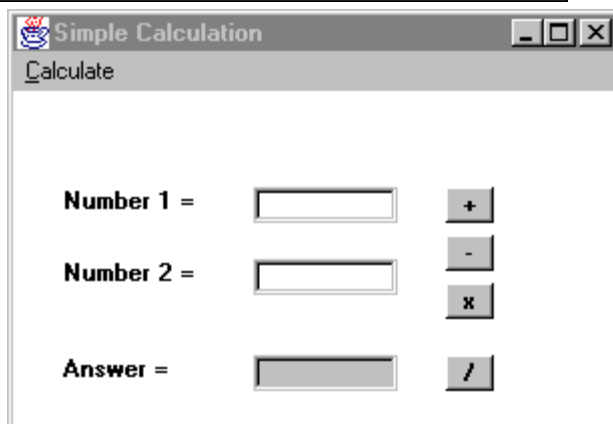
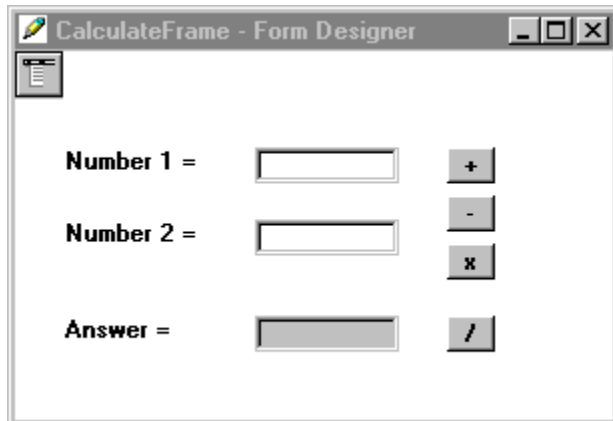
To create a new menu bar in source code, use this syntax:

```
mb = new java.awt.MenuBar();
```

| Part | Type    | Description                                                |
|------|---------|------------------------------------------------------------|
| mb   | MenuBar | The variable name used to reference the component in code. |

### Example

The following two screen shots show a menu bar at design time and then at runtime.



When you double-click on the MenuBar component, the Menu Designer opens so that you can add Menu and MenuItem components. Click on the appropriate placeholder on the menu bar and enter the text that should appear in that component's Label



property.

## MenuBar Properties

[Class](#)

[Main.MenuBar](#)

[Name](#)

## MenuItem component

```
{button Properties,PI('vcafe.hlp','MenuItem_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button Example,JI('vcafe.hlp','Example_MenuItem')} {button API,JI('APIRef.hlp','java.awt.MenuItem.html')}
```

### Description

An item in a menu. Menu items are the commands that appear on a pull-down menu.

Visual Cafe creates menu items for you automatically in the Menu Editor as you edit a [MenuBar component](#).

See: [Adding Menus to a Form](#)

**Tip:** When using the Interaction Wizard to connect a MenuItem component to another component, it may be easiest to start the interaction line from the MenuItem in the Menu Designer and drag the line to the appropriate component in the Project window.

### Properties

To create a menu separator, enter a single hyphen (-) in the Label property, or set the [Separator property](#) to true.

### Coding the component

The Java language does not require you to create a variable to reference a menu item. Instead, you can refer to the menu item by its label.

To create a menu item with the specified label in project code, use this syntax:

```
menuItem1 = new java.awt.MenuItem(label);
```

| Part      | Type   | Description                                                                    |
|-----------|--------|--------------------------------------------------------------------------------|
| menuItem1 |        | MenuItem The variable name used to reference the component in code.            |
| label     | String | The label for the menu item, or null for an unlabeled menu item.               |
| Menu1     | Menu   | The variable name of the menu component to which you are adding the menu item. |

To create a menu item labelled "Undo" and add it to a Menu with the variable name editMenu, do the following:

```
undoMenu = new java.awt.MenuItem("Undo");  
editMenu.add(undoMenu);
```

Alternatively you could have the editMenu automatically create the MenuItem for you:

```
editMenu.add("Undo");
```

### Example

In the example of a menu being developed at design time, the elements "Add," "Multiply," "Subtract", and "Divide" are MenuItem components.

## MenuItem Properties

[Class](#)

[Enabled](#)

[Label](#)

[Menu Shortcut](#)

[Name](#)

[Separator](#)



## MonthSpinner component

```
{button Properties,PI('vcafe.hlp','Spinner2_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_MonthSpinner')} {button API,JI('APIRef.hlp','symantec.itools.awt.util.spinner.MonthSpinner.html')}
```

### Description

A text box that shows one month of the year, and has up and down arrows to the right that allow selecting any month of the year. Use this component to allow your user to select a month.

At run time, only the selected value is displayed in the text box.

### Properties

Use the [Value property](#) to set the initial month. 0 corresponds to January, 1 to February, etc.

Use the [Maximum and Minimum properties](#) to set the maximum and minimum allowed month. 0 corresponds to January, 1 to February, etc.

### Example

This screen shot shows the four types of Visual Cafe spinner components. Each component has a label component under it. Various colors were chosen for the Foreground property to display the colored text.



## Month/DaySpinner Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Dynamic Resizing](#)

[Editable](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[List Items](#)

[Maximum](#)

[Minimum](#)

[Name](#)

[Orientation](#)

[Value](#)

[Visible](#)

[Wrappable](#)

## MovingAnimation component

```
{button Properties,PI('vcafe.hlp','MovingAnimation_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_MovingAnimation')} {button API,JI('APIRef.hlp','symantec.itools.multimedia.MovingAnimation.html')}
```

### Description

Creates an animation by displaying a series of images in sequence. This animation moves within the component while the images display. The initial image is drawn at the left edge of the component. Each subsequent image is drawn within the component, but the origin of the image is shifted left or right by the amount specified by the [Shift Offset property](#).

### Properties

To specify the animation sequence, double-click on the [URL List property](#) to display the URL List dialog box. In the dialog box, enter a list of JPEG or GIF graphic files. List the files in the order you want them to be displayed.

Run an animated sequence one or more times by setting the [Loop Count property](#).

Ignore the loop count and run an animated sequence forever by setting the [Repeat Mode property](#) to true.

To view your animation at design time, set the [Preview Component property](#) to true.

To specify the movement of the animated image, use the [Shift Offset property](#). The value is pixels per frame. A negative value shifts the image to the left.

To allow the user, or the program, to start and stop the animation, use the Interaction Wizard.

### Example

This screen shot is of the MovingAnimation component in the Samples directory.



## **MovingAnimation Properties**

[Background](#)

[Bounds](#)

[Class](#)

[Clear Frame](#)

[Cursor](#)

[Delay](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Loop Count](#)

[Name](#)

[Preview Component](#)

[Repeat Mode](#)

[Shift Offset](#)

[URL List](#)

[Visible](#)



## MultiList component

```
{button Properties,PI('vcafe.hlp','MultiList_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_MultiList')} {button API,JI('APIRef.hlp','symantec.itools.awt.MultiList.html')}
```

### Description

Creates a box that displays a matrix of items which the user can select. The user cannot type or edit a selection in a list box.

The user can resize a column at run-time by dragging the column boundary to a new position.

Use the Interaction Wizard to trigger an action when a MultiList row is selected. You can not use visual tools to create an interaction between a list item and another component, this can only be done in source code.

See: [Creating a MultiList](#)

### Properties

To create columns, use the [Column Headings property](#) to specify a label for each column. List the columns from left to right. By default all columns have the same width, and headings are clipped if necessary.

Use the [Heading Font property](#) to specify the font used in the headings.

To change the default column widths, use the [Column Sizes property](#) to specify the width of each column in pixels.

Use the [Column Alignments property](#) to specify how the text in each column is justified.

To include an item in a column, use the [List Items property](#). Place a semicolon (;) in between the text for each column.

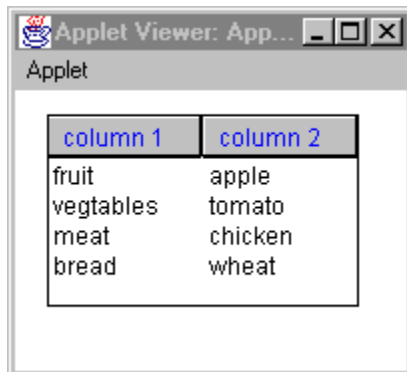
Use the [Allow Sorting property](#) to specify whether the list gets sorted when a column heading is clicked.

Use the [Multiple Mode property](#) to allow multiple rows to be selected at once.

### Example

The following MultiList component has two Column Heading property values, "column1" and "column2", and the following text entry in the List Item property.

```
fruit;apple  
vegetables;tomato  
meat;chicken  
bread;wheat
```



## MultiList Properties

[Allow Sorting](#)

[Background](#)

[Bounds](#)

[Cell BackGround](#)

[Cell Font](#)

[Cell Foreground](#)

[Class](#)

[Column Alignments](#)

[Column Headings](#)

[Column Sizes](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Heading Background](#)

[Heading Font](#)

[Heading Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[List Items](#)

[Multiple Mode](#)

[Name](#)

[Visible](#)



## NumericSpinner component

```
{button Properties,PI('vcafe.hlp','NumericSpinner_properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example2_NumericSpinner')} {button Example,JI('vcafe.hlp','Example_NumericSpinner')} {button API,JI('APIRef.hlp','symantec.itools.awt.util.spinner.NumericSpinner.html')}
```

### Description

A text box that shows one of a list of numbers, and has up and down arrows to the right that allow selecting any one of a range of fixed values.

At run time, only the selected value is displayed in the text box.

### Properties

Use the [Value property](#) to set the initial value.

Use the [Maximum and Minimum properties](#) to set the maximum and minimum allowed values.

### Example

This screen shot shows the four types of Visual Cafe spinner components. Each component has a label component under it. Various colors were chosen for the Foreground to display the colored text.



### Example

This screen shot shows the four types of Visual Cafe spinner components. Each component has a label component under it. Various colors were chosen for the Foreground to display the colored text.



## **NumericSpinner Properties**

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Editable](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Increment](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Maximum](#)

[Minimum](#)

[Name](#)

[Orientation](#)

[Value](#)

[Visible](#)

[Wrappable](#)

## OpenFileDialog component

```
{button Properties,PI(`vcafe.hlp`,`FileDialog_Properties`)} {button Events,PI(`vcafe.hlp`,`Events_summary`)} {button  
API,JI(`APIRef.hlp`,`java.awt.FileDialog.html`)}
```

### Description

A modal dialog that allows the user to specify a file to be opened. The exact look and behavior of this dialog depends on the native operating system the program is running under and cannot be changed.

**Note:** Both OpenFileDialog and SaveFileDialog are objects of type `java.awt.FileDialog`. They only differ in the value of the [Mode property](#). OpenFileDialogs have a mode of "LOAD", while SaveFileDialogs have a mode of "SAVE".

**Note:** Both OpenFileDialog and SaveFileDialog cannot be used in Applets for security reasons. They can only be used in applications.

### Properties

Use the [\\_Default Directory property](#) to specify the initial directory that is shown when the dialog is displayed.

Set the [\\_Default File Name property](#) to specify an initial file name or file name template to use when the dialog is displayed.

## FileDialog Properties

[Class](#)

[Default Directory](#)

[Default File Name](#)

[Mode](#)

[Name](#)

[Title](#)

## Panel component

```
{button Properties,PI('vcafe.hlp','Panel_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button  
API,JI('APIRef.hlp','java.awt.Panel.html')}
```

### Description

A generic container. A panel can contain other visual components and panels. Panels do not support menus.

Use Panel to

- create a subcontainer that organizes container space within an Applet, Frame, TabPanel, Dialog, etc. This simplifies your component layout task.
- form a basis for a layout style.
- hold other specialized Panel containers.

The following predefined subclasses of Panel are available.

|                                |                                            |                                      |
|--------------------------------|--------------------------------------------|--------------------------------------|
| <a href="#">Applet</a>         | <a href="#">BorderPanel</a>                | <a href="#">Calendar</a>             |
| <a href="#">ComboBox</a>       | <a href="#">DaySpinner</a>                 | <a href="#">Grid</a>                 |
| <a href="#">ImageListBox</a>   | <a href="#">ImagePanel</a>                 | <a href="#">KeyPressManagerPanel</a> |
| <a href="#">ListSpinner</a>    | <a href="#">MonthSpinner</a>               | <a href="#">MultiList</a>            |
| <a href="#">NumericSpinner</a> | <a href="#">RadioButtonGroupPane<br/>l</a> | <a href="#">ScrollingPanel</a>       |
| <a href="#">ScrollPane</a>     | <a href="#">SlideShow</a>                  | <a href="#">SplitterPanel</a>        |
| <a href="#">StatusBar</a>      | <a href="#">TabPanel</a>                   | <a href="#">ToolBarPanel</a>         |
| <a href="#">TreeView</a>       | <a href="#">Wizard</a>                     |                                      |

### Properties

Use the [Layout property](#) to set the desired layout manager.

### Coding the component

To create a new Panel, use the following syntax:

```
panel1= new java.awt.Panel();
```

| Part   | Type  | Description                                                |
|--------|-------|------------------------------------------------------------|
| panel1 | Panel | The variable name used to reference the component in code. |

## Panel Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Layout](#)

[Name](#)

[Visible](#)





## PasswordDialog component

```
{button Properties,PI('vcafe.hlp','Common_Dialog_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button Example,JI('vcafe.hlp','Example_PasswordDialog')}
```

### Description

A dialog that prompts the user for a user name and password. This is a simple dialog with user id and password fields. When you add a PasswordDialog component, a new Form Designer window opens. You can extend this dialog by adding components. This is done by dragging components and containers to this Form Designer window as necessary.

Use PasswordDialog to prompt the user for a name and password. Dialog boxes are intended to be temporary window objects.

### Properties

Set the password display character by selecting the password field and entering a character in the [echo\\_property](#).

### Example

This is the default Password dialog box.



## Plasma component

```
{button Properties,PI('vcafe.hlp','Plasma_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_Plasma')} {button API,JI('APIRef.hlp','symantec.itools.multimedia.Plasma.html')}
```

### Description

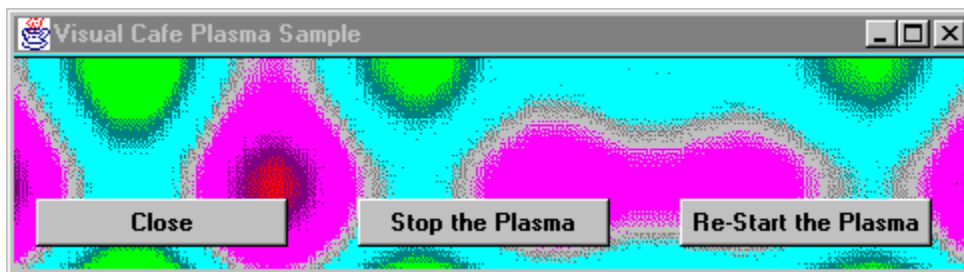
Creates an animation of colored amorphous shapes, where colors gradually modulate as shapes merge and separate. This multimedia component is provided for novelty and programming convenience.

### Properties

To turn off the animation of the Plasma component during design time, use the [Preview Component property](#).

### Example

This is a screen shot of the Plasma component. Buttons have been added and connected to the Plasma component by using the Interaction Wizard to start and stop the display.



## Plasma Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[Preview Component](#)

[Visible](#)



## PostalCode component

```
{button Properties,PI('vcafe.hlp','Predefined_TextField_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button API,JI('APIRef.hlp','symantec.itools.awt.util.edit.PostalCode.html')}
```

### Description

A FormattedTextField in which your user can type text that is limited to an postal code format (a mix of characters and numbers). Text formatting logic is applied to the user input. If the text box already contains text, the user can select the default text and delete or edit it.

Use the Interaction Wizard to trigger an action when the value of this component is changed.

### Properties

The mask format is unchangeable, and set to A9A/-9A9. See: [Mask property](#).

Use the [Editable property](#) to prevent the user from being able to edit the number.

## ProgressBar component

```
{button Properties,PI('vcafe.hlp','ProgressBar_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button Example,JI('vcafe.hlp','Example_ProgressBar')} {button API,JI('APIRef.hlp','symantec.itools.awt.util.ProgressBar.html')}
```

### Description

A bar that displays the percentage completed of a particular process. It is commonly used to indicate the percentage completed of a printing task or installing a program. The bar has no user interaction.

See also: [ProgressDialog](#)

### Properties

To show the percent complete as a percentage in addition to graphically as a bar, use the [Show Percentage property](#).

To set the percent complete a process is, use the [Value property](#). For example, a value of 33 would indicate 33% complete.

To specify the color of the progress bar, use the [ProgressBar Color property](#).

To specify whether the progress bar is drawn as a single solid bar or a series of boxes, use the [Box Bar Style property](#).

To specify the box width when the progress bar is drawn as a series of boxes, use the [Box Width property](#).

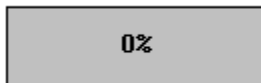
To specify the size of the gap between boxes when the progress bar is drawn as a series of boxes, use the [Gap Width property](#).

### Coding the component

While a process is underway, periodically note the percentage complete it is by calling the [setProgressPercent](#) method.

### Example

The following is a default ProgressBar component.



## ProgressBar Properties

[Alignment Style](#)

[Background](#)

[Bevel Style](#)

[Border Color](#)

[Border Indent](#)

[Bounds](#)

[Box Width](#)

[Class](#)

[Cursor](#)

[Draw as Boxes](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Gap Width](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[ProgressBar Color](#)

[Show Progress](#)

[Value](#)

[Visible](#)

## ProgressDialog component

```
{button Properties,PI('vcafe.hlp','Common_Dialog_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button Example,JI('vcafe.hlp','Example_ProgressDialog')}
```

### Description

A simple dialog that displays the progress of a lengthy task. You can extend this dialog by adding components. This is done by dragging components and containers to this Form Designer window as necessary.

Use a ProgressDialog to

- Display print status
- Show percent of a file copied
- Indicate progress of any task

The progress dialog contains a [ProgressBar component](#). Use the interaction Wizard to update the percentage shown on the progress bar by getting the value from another component or an expression. At runtime, call the ProgressBar's [setProgressPercent](#) method to update the display.

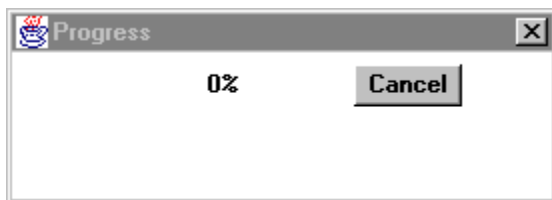
See also: [ProgressBar component](#)

### Properties

To change the dialog window title, use the [Title property](#).

### Example

This example is of the default Progress dialog box.



## RadioButtonGroupPanel component

```
{button Properties,PI('vcafe.hlp','RadioButtonGroupPanel_Properties')} {button  
Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_RadioGroupPanel')} {button  
API,JI('APIRef.hlp','symantec.itools.awt.RadioButtonGroupPanel.html')}
```

### Description

Extends Panel.

Creates an rectangular panel area that automatically groups the radio buttons that it contains.

Add radio buttons to the panel by dragging them from the Component Palette onto the panel. **Note:** Since CheckBoxes and RadioButtons are actually the same base component, any CheckBoxes that are dropped into the RadioButtonGroupPanel turn into RadioButtons.

All the radio buttons within the RadioButtonGroupPanel act together. Only one of the radio buttons can be "on" at a time. This is accomplished by making each RadioButton added to the panel a member of the panel's private CheckboxGroup.

### Example

This example shows a RadioButtonGroupPanel (in gray) that contains two RadioButton components.



**RadioGroupBox**



## RadioButtonGroupPanel Properties

[Background](#)

[Border Color](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Inset Padding Bottom](#)

[Inset Padding Sides](#)

[Inset Padding Top](#)

[Label](#)

[Label Alignment](#)

[Label Color](#)

[Layout](#)

[Name](#)

[Padding Bottom](#)

[Padding Left](#)

[Padding Right](#)

[Padding Top](#)

[Selected RadioButton](#)

[Style](#)

[Visible](#)



## Rect component

```
{button Properties,PI('vcafe.hlp','Shape_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_Rect')} {button API,JI('APIRef.hlp','symantec.itools.awt.shape.Rect.html')}
```

### Description

A simple rectangle. This component is provided for programming convenience, so that you don't have to draw the shape.

### Properties

Use the [Border\\_Style](#) , [Fill\\_Mode](#) , [Fill\\_Color](#) , [Background](#) , and [Foreground](#) properties to achieve the desired component look.

### Example

This screen shot shows six predefined Visual Cafe shapes; [Rect](#) , [Circle](#) , [Square](#) , [Ellipse](#) , [VerticalLine](#) , and [HorizontalLine](#) . The component use a variety of property settings to generate the different effects.



## RollOverButton component

```
{button Properties,PI('vcafe.hlp','RollOverButton_Properties')}} {button Events,PI('vcafe.hlp','Events_Summary')}} {button API,JI('APIRef.hlp','symantec.itools.awt.RollOverButton.html')}
```

### Description

This is a button that allows three different states and displays the document with a given URL when clicked. Each button state has its own associated image. Each image is specified by providing the file name or the URL of the file containing the image. The document to show is specified by providing the "LinkURL" of that document.

The "standard" state is when the mouse is not over the button. If the standard image is not specified, the button will be transparent when in the standard state, otherwise the specified image will be displayed.

The "over" state is when the mouse cursor is over the button. This state also displays the LinkURL if it is specified.

The "down" state is when the mouse button is pressed inside the button. When there is a MOUSE\_UP in the button, it will attempt to show the document at the LinkURL unless it is not specified. This state also displays the LinkURL if it is specified.

### Properties

Use the [Standard Image property](#) to specify the image for when the mouse is not over the button. If the standard image is not specified, the button will be transparent when in the standard state.

Use the [Mouse Over Image property](#) to specify the image for when the mouse cursor is over the button.

Use the [Mouse Down Image property](#) to specify the image for when the mouse button is pressed inside the button.

Ensuring the [Clear Frame property](#) is set to false prevents flickering caused by repainting the component background before drawing the component image.

To center the image in the button, use the [Center Mode property](#).

## RollOverButton Properties

[Background](#)

[Bounds](#)

[Center Mode](#)

[Class](#)

[Clear Frame](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[HTML Link URL](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Mouse Down Image](#)

[Mouse Over Image](#)

[Name](#)

[Standard Image](#)

[Visible](#)

## SaveFileDialog component

```
{button Properties,PI(`vcafe.hlp`,`FileDialog_Properties')}} {button Events,PI(`vcafe.hlp`,`Events_summary')}} {button  
API,JI(`APIRef.hlp`,`java.awt.FileDialog.html')}
```

### Description

A modal dialog that allows the user to specify a filename to be used for saving a file. The exact look and behavior of this dialog depends on the native operating system the program is running under and cannot be changed.

**Note:** Both OpenFileDialog and SaveFileDialog are objects of type `java.awt.FileDialog`. They only differ in the value of the [Mode property](#). OpenFileDialogs have a mode of "LOAD", while SaveFileDialogs have a mode of "SAVE".

**Note:** Both OpenFileDialog and SaveFileDialog cannot be used in Applets for security reasons. They can only be used in applications.

### Properties

Use the [\\_Default Directory property](#) to specify the initial directory that is shown when the save dialog is displayed.

Set the [\\_Default File Name property](#) to specify an initial file name or file name template to use when the save dialog is displayed.

## ScrollingPanel component

```
{button Properties,PI('vcafe.hlp','ScrollingPanel_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button API,JI('APIRef.hlp','symantec.itools.awt.ScrollingPanel.html')}
```

### Description

A simple container with scroll bars.

The ScrollingPanel is a panel with automatic scroll bars. It may contain only one component/container/panel/etc. It automatically tracks the size of this (usually large) component and provides scroll bars so the entire component may be viewed within a panel of limited size. Typically, the added component would be a panel (or some other container) which would then contain a variety of other components.

Typically a ScrollingPanel is used to view a portion of a larger container or component which is contained within the ScrollingPanel. Scroll bars are then used to change the portion of the container or component which is in view. A small ScrollingPanel could be used to display a portion of a large image, for example, and the user would use the scroll bars to move the view to other parts of the image.

While a ScrollingPanel can only contain one object, this object can be a Panel full of other components.

Use this component to display a region that allows the user to scroll through all items in the panel, and specifically to:

- create a subcontainer that organizes container space within an Applet, Frame or Dialog container. This simplifies your component layout task.
- hold other specialized Panel containers.

See: [Creating a ScrollingPanel](#)

**Note:** JDK 1.1 now has a very similar component, [ScrollPane](#). It is recommended that you use that component unless you need some of the enhanced properties of the ScrollingPanel Component. That includes properties: [Minimum Height and Width](#), and [Scroll Increment](#).

To specify the minimum dimensions returned by the `getMinimumSize` method, use the [Minimum Height and Width properties](#)

To specify the increment, in pixels, that the panel scrolls when a scrollbar arrow is clicked, use the [Scroll Increment property](#).

## ScrollingPanel Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Minimum Height](#)

[Minumum Width](#)

[Name](#)

[Scroll Increment](#)

[Visible](#)

## ScrollPane component

```
{button Properties,PI('vcafe.hlp','ScrollPane_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button API,JI('APIRef.hlp','java.awt.ScrollPane.html')}
```

### Description

A simple container with scroll bars.

The ScrollPane is a panel with automatic scroll bars. It may contain only one component/container/panel/etc. It automatically tracks the size of this (usually large) component and provides scroll bars so the entire component may be viewed within a panel of limited size. Typically, the added component would be a panel (or some other container) which would then contain a variety of other components.

Typically a ScrollPane is used to view a portion of a larger container or component which is contained within the ScrollPane. Scroll bars are then used to change the portion of the container or component which is in view. A small ScrollPane could be used to display a portion of a large image, for example, and the user would use the scroll bars to move the view to other parts of the image.

While a ScrollPane can only contain one object, this object can be a Panel full of other components.

Use this component to display a region that allows the user to scroll through all items in the panel, and specifically to:

- create a subcontainer that organizes container space within an Applet, Frame or Dialog container. This simplifies your component layout task.
- hold other specialized Panel containers.

Use the [Scrollbar Display Policy property](#) to choose whether the scroll bars get displayed as needed, or are always/never displayed.



## ScrollPane Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[Scrollbar Display Policy](#)

[Visible](#)

## ScrollingText component

```
{button Properties,PI('vcafe.hlp','ScrollingText_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button API,JI('APIRef.hlp','symantec.itools.multimedia.ScrollingText.html')}
```

### Description

A scrolling text component. It forms a text banner that scrolls specified text horizontally. The component allows multiple messages and links.

Use the [Messages property](#) to enter a list of messages to display. To include more than one item in the list, press CTRL+ENTER (on PCs) or RETURN (on Macs) after typing each item.

Use the [Message Links property](#) to enter a list of URLs to link to. To include more than one item in the list, press CTRL+ENTER (on PCs) or RETURN (on Macs) after typing each item.

Use the [Scroll Direction property](#) to specify the direction the messages should scroll.

To set the delay, in milliseconds, between scroll steps, use the [Scroll Interval property](#).

To set the amount the text moves, in pixels, each scroll step, use the [Scroll Unit property](#).

## ScrollingText Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Frame Name](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Message Hilite Color](#)

[Message Links](#)

[Messages](#)

[Name](#)

[Scroll Direction](#)

[Scroll Interval](#)

[Scroll Unit](#)

[Visible](#)

## SlideShow component

```
{button Properties,PI('vcafe.hlp','SlideShow_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button Example,JI('vcafe.hlp','Example_SlideShow')} {button API,JI('APIRef.hlp','symantec.itools.multimedia.SlideShow.html')}
```

### Description

Displays a series of images in an applet or application. You can provide descriptive text for each image.

**Note:** When encountering an incorrect URL, SlideShow sends an error to standard output and goes to the next URL.

### Properties

To specify a list of files containing displayable images, double-click in the [URL List property](#) field to display the URL List dialog. Images display in the order that they are placed on the list.

To associate a text string with a specified URL address, enter the text in the Description column of the URL List dialog box.

### Coding the component

Use this syntax to create a slide show component in project source code:

```
slideShow1 = new symantec.itools.awt.SlideShow();
```

| Part | Type | Description |
|------|------|-------------|
|------|------|-------------|

|            |           |                                                            |
|------------|-----------|------------------------------------------------------------|
| slideShow1 | SlideShow | The variable name used to reference the component in code. |
|------------|-----------|------------------------------------------------------------|

### Example

The following screen shot shows the SlideShow component that is used in the Visual Cafe DDE Tutorial. The SlideShow component displays four package pictures, and an ImageViewer component displays the art work at the bottom that is used as the slide show controller. The SlideShow is "activated" by two InvisibleButtons on the slide controller ImageViewer component. One invisible button overlays the "previous" arrow and the other overlays the "next" arrow. The interactions between the buttons and SlideShow were created with the Interaction Wizard. The text to the right of SlideShow displays is a WrappingLabel component. An interaction is defined between the SlideShow and the WrappingLabel so that the text changes as each slide displays.

**Tip:** Since components do not recognize an initialization event, to display the first slide's description in the WrappingLabel, the first text string was entered in the label's Text property as the default text.

**Tip:** Overlapping components - browsers handle components layered on each other differently. In this SlideShow example, some browsers display/layer the InvisibleButtons on top of the ImageViewer component, while others displayed them underneath. Therefore, this example required two sets of InvisibleButtons, one set on top of ImageViewer and the other underneath.

## SlideShow Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[URL List](#)

[Visible](#)

## SocialInsuranceNumber component

```
{button Properties,PI('vcafe.hlp','Predefined_TextField_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button API,JI('APIRef.hlp','symantec.itools.awt.util.edit.SocialInsuranceNumber.html')}
```

### Description

A FormattedTextField in which your user can type text that is limited to an social insurance number format (nine digit number). Text formatting logic is applied to the user input. If the text box already contains text, the user can select the default text and delete or edit it.

Use the Interaction Wizard to trigger an action when the value of this component is changed.

### Properties

The mask format is unchangeable, and set to 999/-999/-999. See: [Mask property](#).

Use the [Editable property](#) to prevent the user from being able to edit the number.

## SocialSecurityNumber component

```
{button Properties,PI('vcafe.hlp','Predefined_TextField_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button API,JI('APIRef.hlp','symantec.itools.awt.util.edit.SocialSecurityNumber.html')}
```

### Description

A FormattedTextField in which your user can type text that is limited to a social security number format (nine digit number). Text formatting logic is applied to the user input. If the text box already contains text, the user can select the default text and delete or edit it.

Use the Interaction Wizard to trigger an action when the value of this component is changed.

### Properties

The mask format is unchangeable, and set to 999/-99/-9999. See: [Mask property](#).

Use the [Editable property](#) to prevent the user from being able to edit the number.

## SoundPlayer component

```
{button Properties,PI('vcafe.hlp','SoundPlayer_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button API,JI('APIRef.hlp','symantec.itools.multimedia.SoundPlayer.html')}
```

### Description

Creates a nonvisual class that plays a Sun AU format sound file. The design time component looks like this



The SoundPlayer component is not visible at runtime. Use other components, such as radio buttons and image buttons, to control the playing of the sound. Make the component connections by using the Interaction Wizard.

**Note:** The target system must have been configured with optional Sun Java classes in order for this component to work.

### Properties

Use the [URL List property](#) to specify the sounds clips to play.

Use the [Synchronized Mode property](#) to specify whether the list of sound clips play serially or all at once. If true, the sound clips play serially, otherwise they all play at once.

Use the [Repeat Count property](#) to specify the number of times the list of sound clips is played.



## SoundPlayer Properties

[Class](#)

[Name](#)

[Repeat Count](#)

[Synchronized Mode](#)

[URL List](#)

## SplitterPanel component

```
{button Properties,PI('vcafe.hlp','SplitterPanel_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button API,JI('APIRef.hlp','symantec.itools.awt.SplitterPanel.html')}
```

### Description

A container that can be divided into a number of subpanels, which holds visual components and other panels.

Use SplitterPanel specifically to:

- create a subcontainer that organizes container space within an Applet, Frame or Dialog container. This simplifies your component layout task.
- hold other specialized Panel containers.

The SplitterPanel component is the parent Panel containing a set of subpanels. You must write code to divide the parent panel into subpanels and to populate those subpanels. See the "Coding the component" sample below to see how this is done.

SplitterPanel automatically recognizes the MouseDrag event as the command to resize the appropriate subpanel boundary.

### Runtime modification

Subpanels can be resized at runtime by dragging panel borders with the mouse.

### Coding the component

This code example splits a SplitterPanel into four subpanels, and adds a button to two of the subpanels.

```
// divide the parent panel into subpanels
splitterPanel1.split(splitterPanel1.SPLIT_HOR);
splitterPanel1.getTopPanel().split(splitterPanel1.SPLIT_VER);
splitterPanel1.getBottomPanel().split(splitterPanel1.SPLIT_VER);
// add a button to the top left subpanel
splitterPanel1.getTopLeftPanel().add(new Button("Top Left"));
// add a button to the lower right subpanel
splitterPanel1.getBottomRightPanel().add(new Button("Bottom Right"));
```

Individual subpanels can be accessed in code using any of these methods:

- getBottomLeftPanel
- getBottomPanel
- getBottomRightPanel
- getLeftPanel
- getRightPanel
- getSub2Panel
- getSubPanel
- getTopLeftPanel
- getTopPanel
- getTopRightPanel

## **SplitterPanel Properties**

[Allow Dynamic Moving](#)

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Enforce Minimum Dimension](#)

[Font](#)

[Foreground](#)

[Gap Color](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Layout](#)

[Name](#)

[Propagate Resize](#)

[Use 3D Border](#)

[Visible](#)



## Square component

```
{button Properties,PI('vcafe.hlp','Shape_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_Square')} {button API,JI('APIRef.hlp','symantec.itools.awt.shape.Square.html')}
```

### Description

A simple square. This component is provided for programming convenience, so that you don't have to draw the shape.

### Properties

Use the [Border\\_Style](#) , [Fill\\_Mode](#) , [Fill\\_Color](#) , [Background](#) , and [Foreground](#) properties to achieve the desired component look.

### Example

This screen shot shows six predefined Visual Cafe shapes; [Rect](#) , [Circle](#) , [Square](#) , [Ellipse](#) , [VerticalLine](#) , and [HorizontalLine](#) . The component use a variety of property settings to generate the different effects.



## StateCheckBox component (standard/dbAWARE)

```
{button Properties,PI('vcafe.hlp','StateCheckBox_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button API  
(standard),JI('APIRef.hlp','symantec.itools.awt.StateCheckBox.html')} {button API  
(dbAWARE),JI('APIRef.hlp','symantec.itools.db.awt.StateCheckBox.html')}
```

### Description

A two- or three-state checkbox that doesn't have an associated text label. --  . A two-state checkbox behaves just like the standard checkbox. In three-state mode clicking the checkbox can switch the checkbox to a third state that appears both gray and checked.

The third state is often used to indicate that an attribute of the current selection varies across the selected items. For example, a checkbox used to indicate "bold text" might use the third state if the currently selected text included both bold and plain characters. It is also used to indicate a default action or state.

This checkbox does not have a text string associated with it.

Display an option with fixed states, and specifically to

- manage a selection-deselection user task.
- display a check mark.
- post an event to another component.
- determine that only one choice in a set of CheckBoxes is selected.

Use the Interaction Wizard to trigger an action when the check box is clicked.

### Properties

Specify the number of option states, either two or three by using the [Style property](#). Style determines the number of "states" that the checkbox can have.

Set the initial state, either checked, unchecked, or default (the third state), by using the [State property](#).

## **StateCheckBox Properties**

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[State](#)

[Style](#)

[Visible](#)

## StatusBar component

```
{button Properties,PI('vcafe.hlp','StatusBar_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_StatusBar')} {button API,JI('APIRef.hlp','symantec.itools.awt.StatusBar.html')}
```

### Description

A rectangular area suitable for displaying status text.

Use a StatusBar to show document status and other information, like the meaning of a button or other interface element in a window. Typically, a status bar appears at the bottom of a window.

### Runtime modification

Use the [setStatusText](#) method to change the status bar text when the application or applet is running.

### Properties

Set the text to display in the status bar by editing the [Status Text property](#).

Make the StatusBar border raised, inset, plain, or absent by changing the [Bevel Style property](#).

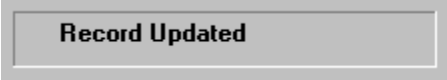
To align a StatusBar to the bottom of a window, set the containing window's Layout property to BorderLayout, and then set the StatusBar's [Placement property](#) to South.

To change the distance between the drawn border and the usable display area within the border, use the [Inset properties](#).

To change the distance between the drawn border and the actual bounds of the component, use the [Padding properties](#).

### Example

This simple StatusBar component has a Style of Lowered and a predefined status text string.



**Record Updated**

## StatusBar Properties

[Background](#)

[Bevel Style](#)

[Border Color](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Inset Padding Bottom](#)

[Inset Padding Sides](#)

[Inset Padding Top](#)

[Label](#)

[Label Alignment](#)

[Label Color](#)

[Name](#)

[Padding Bottom](#)

[Padding Left](#)

[Padding Right](#)

[Padding Top](#)

[Status Text](#)

[Status Text Color](#)

[Visible](#)



## StatusScroller component

```
{button Properties,PI('vcafe.hlp','StatusScroller_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button API,JI('APIRef.hlp','symantec.itools.awt.util.StatusScroller.html')}
```

### Description

Displays a scrolling message in the status window of a browser or applet viewer.

### Runtime modification

Use the [setString](#) method to change the status bar text when the application or applet is running.

### Properties

Set the text to display in the StatusScroller by editing the [String property](#).

To scroll the message repeatedly, set the [Repeat property](#).

To specify the direction the message should scroll, use the [Right To Left property](#).

To specify whether the scrolling will automatically start when the applet is loaded, use the [Auto Start property](#).

To specify whether the message will scroll completely off before scrolling on again, use the [Scroll Clean property](#).

## StatusScroller Properties

[Auto Start](#)

[Class](#)

[Delay](#)

[Name](#)

[Repeat](#)

[Right To Left](#)

[Scroll Clean](#)

[String](#)

## TabPanel component

```
{button Properties,PI('vcafe.hlp','TabPanel_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_TabPanel')} {button API,JI('APIRef.hlp','symantec.itools.awt.TabPanel.html')}
```

### Description

The TabPanel is a Panel extension which provides for a tabbed dialog effect. Along the top (by default) of the panel is a series of file folder-like tabs, each with a text label. Each tab is associated with a panel or component that gets shown when the user clicks on the tab. The TabPanel automatically manages swapping panels when a tab selected. This arrangement conserves window space.

See: [Creating a TabPanel](#)

### Properties

To define the tab text strings, use the [Tab Labels](#) property.

To display tabs at the bottom of the TabPanel component, set the [Tabs On Bottom](#) property to true.

To set which subpanel is initially shown, use the [Active Tab property](#).

To change the order of the subpanels, change their order in the Project window.

### Coding the component

In code, to create a tab, a tab label, and an associated panel, call the [addTabPanel](#) method. Call the [addTabPanel](#) method for each tab you create.

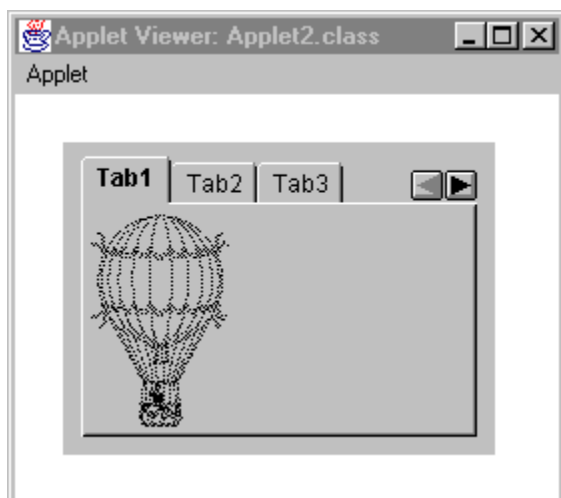
To access any tabbed subpanel in project source code, use the [getTabPanel](#) method.

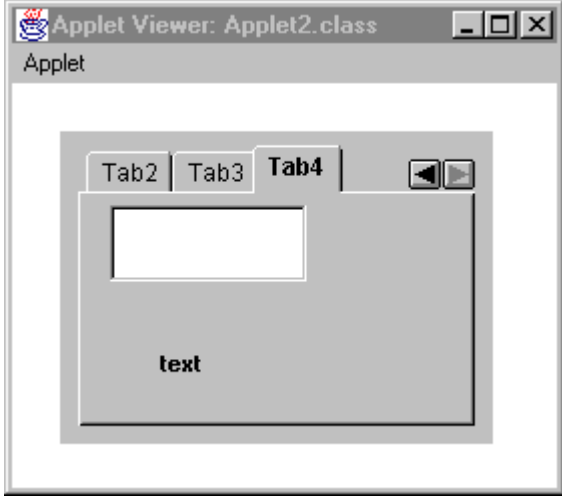
To get the index of the currently active subpanel in project source code, use the [getCurrentPanelNdx](#) method.

### Examples

This first screen shot is of a simple five tab panel at runtime. The first tab panel contains an [ImageViewer component](#). This also shows the "scroll" arrows that display automatically when all tabs cannot be displayed within the component.

The second screen shot shows a tab that contains a default Label and TextField component. Remember, a Panel component must be added to the tab prior to the other standard components for grouping ability.





## **TabPanel Properties**

[Active Tab](#)

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[Tab Labels](#)

[Tabs On Bottom](#)

[Visible](#)

## Timer component

```
{button Properties,PI('vcafe.hlp','Timer_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button API,JI('APIRef.hlp','symantec.itools.util.Timer.html')}
```

### Description

A Timer is an invisible component that generates action events after waiting a specified number of milliseconds.

Use the Interaction Wizard to trigger an action when the timer generates its action event(s).

The Timer displays in the Form Designer at design time, as an icon, but does not display at runtime.



You can also instantiate a Timer component in your project source code.

### Properties

To set the timer, specify the “wait” time in the [Time property](#).

To specify that the timer run, reset, and start continuously, use the [Repeat Automatically property](#).

### Coding the component

Timer does not extend the Component class. It therefore does not have common Component methods, such as `setBounds`, `setVisible`, etc.

Use this syntax to create a Timer component in project source code:

```
timer1 = new symantec.itools.util.Timer(delay, repeat);
```

| Part   | Type    | Description                                                        |
|--------|---------|--------------------------------------------------------------------|
| timer1 | Timer   | The variable name used to reference the component in code.         |
| delay  | int     | The delay before the timer fires an action event, in milliseconds. |
| repeat | boolean | Whether the timer repeatedly generate action events.               |

## Timer Properties

Class

Enabled

Name

Repeat Automatically

Time (ms)

## ToolBarPanel component

```
{button Properties,PI('vcafe.hlp','ToolBarPanel_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_ToolBarPanel')} {button API,JI('APIRef.hlp','symantec.itools.awt.util.ToolBarPanel.html')}
```

### Description

This component creates a panel to which you can add buttons to create a toolbar in a window. This toolbar can allow users access to common functionality in your application or applet. The toolbar is fixed and does not float.

To add space between items on the toolbar, add a [ToolBarSpacer component](#) between elements. **Tip:** The easiest way to add the ToolBarSpacer is to drag the component to the correct position in the Project window.

Toolbars commonly contain buttons, but a ToolBarPanel can hold other types of components like static text, check boxes, even images.

Use the Interaction Wizard to trigger an action when a toolbar's button (or other component) is pressed.

### Properties

To align a ToolBarPanel at the top of a window, set the parent window's [Layout property](#) to BorderLayout, and then set the ToolBarPanel's [Placement property](#) to North. To align the toolbar on the left side of the window, set its Placement property to West.

To make the toolbar border raised, inset, or plain, specify the appropriate bevel look in the [Bevel Style property](#).

To title the toolbar, use the [Label property](#), the [Label Alignment property](#) and the [Label Color property](#).

To change the distance between the drawn border and the usable display area within the border, use the [Inset Padding properties](#).

To change the distance between the drawn border and the actual bounds of the component, use the [Padding properties](#).

### Example

The following is a ToolBarPanel that contains three ImageButton components and two ToolBarSpacer components.





## **ToolBarPanel Properties**

[Background](#)

[Bevel Style](#)

[Border Color](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Inset Padding Bottom](#)

[Inset Padding Sides](#)

[Inset Padding Top](#)

[Label](#)

[Label Alignment](#)

[Label Color](#)

[Name](#)

[Orientation](#)

[Padding Bottom](#)

[Padding Left](#)

[Padding Right](#)

[Padding Top](#)

[Visible](#)

## ToolBarSpacer component

```
{button Properties,PI('vcafe.hlp','ToolBarSpacer_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_ToolBarSpacer')} {button API,JI('APIRef.hlp','symantec.itools.awt.util.ToolBarSpacer.html')}
```

### Description

Use ToolBarSpacer to add a gap between elements in a [ToolBarPanel component](#).

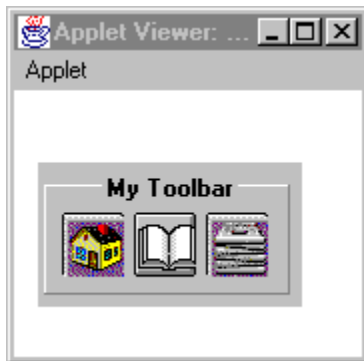
**Tip:** Although you can drag the ToolBarSpacer on to the ToolBarPanel in the Form Designer, you may find it easier to drag the ToolBarSpacer into the Project Window and insert it between objects.

### Properties

To vary the width of the spacer in pixels, use the [Space](#).

### Example

The following is a ToolBarPanel that contains three ImageButton components and two ToolBarSpacer components.



## ToolBarSpacer Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[Space](#)

[Visible](#)

## TreeView component

```
{button Properties,PI('vcafe.hlp','TreeView_Properties')} {button Events,PI('vcafe.hlp','Events_summary')} {button Example,JI('vcafe.hlp','Example_TreeView')} {button API,JI('APIRef.hlp','symantec.itools.awt.TreeView.html')}
```

### Description

An "outline view" of text headings and, optionally, images. The headings are arranged in a hierarchical fashion, and can be expanded to show their sub-headings or collapsed, hiding their sub-headings.

A TreeView is typically used to display information that is organized in a hierarchical fashion like an index or table of contents.

Use the Interaction Wizard to trigger an action in response to TreeView actions. A TreeView generates an action event when a node is expanded/collapsed, double-clicked, or ENTER is pressed.

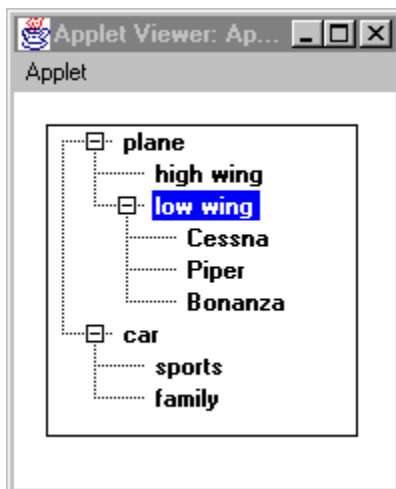
See: [Creating a TreeView](#)

### Properties

To add items to a TreeView, double-click the [Items property](#) to display the editing pane and enter the text you want for the label. Entering one or more spaces before the text label indents that item one or more levels in the resulting tree hierarchy. To include more than one item in the list, press CTRL+ENTER (on PCs) or RETURN (on Macs) after typing each item.

### Example

The following screen shot is of a TreeView component with nine entries in the Items property.



## TreeView Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Items](#)

[Name](#)

[Visible](#)

## USLongDistPhoneNumber component

```
{button Properties,PI('vcafe.hlp','Predefined_TextField_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button API,JI('APIRef.hlp','symantec.itools.awt.util.edit.USLongDistPhoneNumber.html')}
```

### Description

Extends PhoneNumber.

Creates a box in which your user can type text that is limited to a US Domestic long distance phone number (ten-digit number). Text formatting logic is applied to the user input. If the text box already contains text, the user can select the default text and delete or edit it.

To post TextField events or text to other components, use the Interaction Wizard.

### Properties

To specify the required format for the text entry, use the [Mask property](#) in the Property List window. The allowed format is 999/-999/-9999.



## VerticalLine component

```
{button Properties,PI('vcafe.hlp','Shape_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button Example,JI('vcafe.hlp','Example_VerticalLine')} {button API,JI('APIRef.hlp','symantec.itools.awt.shape.VerticalLine.html')}
```

### Description

A vertical line. This component is provided for programming convenience, so that you don't have to draw the shape.

### Properties

Use the [Border\\_Style](#) , [Fill\\_Mode](#) , [Fill\\_Color](#) , [Background](#) , and [Foreground](#) properties to achieve the desired component look.

### Example

This screen shot shows six predefined Visual Cafe shapes; [Rect](#), [Circle](#), [Square](#), [Ellipse](#) , [VerticalLine](#) , and [HorizontalLine](#) . The component use a variety of property settings to generate the different effects.



## Window component

```
{button Properties,PI('vcafe.hlp','Window_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button  
API,JI('APIRef.hlp','java.awt.Window.html')}
```

### Description

A simple top-level window that has no border, no title, and no menubar. It behaves modally, blocking input to other windows when visible.

When you add a Window component to a project, a new Form Designer window opens. You can add other components to the Window by dragging components and containers to the Form Designer as necessary.

Visual Cafe provides frames, dialogs and other window subclasses for you. You must use a Frame component to create an application. You must use the Applet component to create an applet program.

### Runtime modification

Use the [show](#) method to make the Window visible at run time.

### Coding the component

To create a Window in project source code, use the following syntax:

```
window1 = new java.awt.Window(Frame parent);
```

| <b>Part</b> | <b>Type</b> | <b>Description</b>                                                                                                     |
|-------------|-------------|------------------------------------------------------------------------------------------------------------------------|
| window1     | Window      | The variable name used to reference the component in code.                                                             |
| parent      | Frame       | The Frame that is the parent of the Window. A Window requires a parent <a href="#">Frame</a> in order to be displayed. |



## Window Properties

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Layout](#)

[Name](#)

[Visible](#)

## Wizard component

```
{button Properties,PI('vcafe.hlp','Wizard_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button  
API,JI('APIRef.hlp','symantec.itools.awt.Wizard.html')}
```

### Description

The Wizard component simplifies the task of creating a "wizard dialog." A wizard dialog leads the user through a sequence of steps needed to accomplish some task.

Follow these common steps to create your wizard:

- Create a new Frame or Dialog (typically a Dialog).
- Drop a Wizard component on the Dialog.
- Drop components on the Wizard. Typically you drop Panels on the upper part of the Wizard. Each of these panels would contain and organize a page of components. You can also drop components onto the button bar.
- Each time a component is dropped it is shown and becomes the active page. The state of the Back and Next buttons are updated. It is possible to use the Back and Next buttons to change the current page while designing your Wizard.
- Pages can be moved and removed in the Project window.

At run-time, the Wizard's behavior can be extensively customized. See the [Wizard's API documentation](#) for more information.

### Properties

Use the [Buttons Alignment property](#) to align the wizard's buttons left, center, or right.

Use the [Combined Button](#) to combine the Next and Finish buttons into a single button.

Use the [Help Button Visible](#) to hide the Help button so that it can't be used.

## Wizard Properties

[Background](#)

[Bounds](#)

[Buttons Alignment](#)

[Class](#)

[Combined Button](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Help Button Visible](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[Visible](#)

## WrappingLabel component

```
{button Properties,PI(`vcafe.hlp`,`WrappingLabel_Properties`)} {button Events,PI(`vcafe.hlp`,`Events_Summary`)} {button API,JI(`APIRef.hlp`,`symantec.itools.awt.WrappingLabel.html`)}
```

### Description

A multi-line text label. Text is displayed on one or more lines, wrapping as needed to fit in the available horizontal space.

Use a WrappingLabel when you want to display a paragraph of static (not user-editable) text.

An application or applet can change the label text string using the [setText](#) method, but a user cannot edit it.

### Properties

To specify the displayed text, type the text in the [Text property](#).

To specify how the text is justified within the bounds of the wrapping label, use the [Alignment Style property](#).

Use the Property List window to specify a font, color, and point size.

### Example

See the [SlideShow component](#) example.

**Tip:** Since components do not recognize an initialization event, to display the first slide's description in the WrappingLabel, the first text string was entered in the label's Text property as the default text.

## WrappingLabel Properties

[Alignment Style](#)

[Background](#)

[Bounds](#)

[Class](#)

[Cursor](#)

[Enabled](#)

[Font](#)

[Foreground](#)

[Inherit Background](#)

[Inherit Font](#)

[Inherit Foreground](#)

[Name](#)

[Text](#)

[Visible](#)



## ZipCode component

```
{button Properties,PI('vcafe.hlp','Predefined_TextField_Properties')} {button Events,PI('vcafe.hlp','Events_Summary')} {button  
API,JI('APIRef.hlp','symantec.itools.awt.util.edit.ZipCode.html')}
```

### Description

A FormattedTextField in which your user can type text that is limited to a zip code number format (five digit number). Text formatting logic is applied to the user input. If the text box already contains text, the user can select the default text and delete or edit it.

Use the Interaction Wizard to trigger an action when the value of this component is changed.

### Properties

The mask format is unchangeable, and set to 99999. See: [Mask property](#).

Use the [Editable property](#) to prevent the user from being able to edit the number.

**Component procedures and conceptual topics, including creating custom components (component reference is in other files)**

## Understanding the Java AWT

```
{button How  
To,AL('Property_Inspector_using_F1;editing_menus_howto;arranging_components_on_a_form_howto;adding_a_menu_to_a_fo  
rm_howto',0,'')} {button See  
Also,AL('Animation_and_Multithreading;Form_Designer_F1;Creating_Interactions;Nesting_Panels_and_Components;Object_Li  
brary_F1;Differences_between_Applets_and_Applications;Understanding_Visual_Components;Understanding_Workspaces',0,'  
')}
```

The Java Abstract Window Toolkit (AWT) is a standard and portable GUI library that lets you create visual front ends. This GUI library is cross-platform for developing and running [applications](#) and [applets](#). Visual Cafe has integrated the AWT into its visual design environment so you can quickly create your user interfaces. You can view the components defined in the AWT by expanding java.awt in the Packages view of a Project window.

The AWT supplies many [classes](#) for you to develop your Java programs. It is the crucial link between your Java program and the native GUI of the operating system. The AWT performs a very high level of abstraction because there has to be a common denominator in order for your Java program to be portable across platforms. It is a Java package that can be used in any Java program by importing java.awt.\* using the **import** keyword. Visual Cafe does this automatically for you.

In the structure of the AWT, [components](#) are added to and then arranged by [layout](#) managers in [containers](#). There are a variety of [event](#) handling, menu, fonts, and graphics classes in addition to components and containers. The AWT also works well in conjunction with the networking and [threads](#) classes.

Components are what allow you to interact with your program. Components display windows and buttons, lists inside of windows, and allow you to enter text in a field. Components consist of the visible objects such as Scrollbars, Buttons, and TextAreas, just to name a few, that have been added to a Container.





## Using JFC Swing components

```
{button How  
To,AL('Property_Inspector_using_F1;editing_menus_howto;arranging_components_on_a_form_howto;adding_a_menu_to_a_fo  
rm_howto;JAR_properties_howto;Autojar_howto;Creating_jar_howto',0,'')} {button See  
Also,AL('Animation_and_Multithreading;Form_Designer_F1;Creating_Interactions;Nesting_Panels_and_Components;Object_Li  
brary_F1;Differences_between_Applets_and_Applications;Understanding_Visual_Components;Understanding_Workspaces',0,'  
'')}
```

Visual Cafe version 2.5 includes basic support for Swing components. This includes:

- support for JFC 1.0.1
- proper code generation for changes made in the Visual Cafe visual environment
- JAR tool support for pluggable look and feel
- Interaction Wizard support for Swing events
- custom Property Editors for some Swing properties



## Adding a dialog

```
{button Concepts,AL(^Understanding_Containers',0,';')} {button See  
Also,AL(^Forms_adding_objects;Form_Designer_F1',0,';')}
```

In the Component Library, dialogs appear in the Forms group. Some of the dialogs are [top-level components](#) and some must be contained by a top-level component.

1. Drag a Dialog component from the Component Palette or Component Library to the project.



[Details on this step](#)

2. Connect the dialog to a trigger component by using the Interaction Wizard.



[Details on this step](#)

## JavaBeans and Component Library

## Using the Component Library

```
{button How  
To,AL("Add_to_Library_dialog_F1;Adding_Files_to_a_Project_howto;Adding_objects_to_project_howto;Creating_a_Project_howto;  
Forms_adding_objects;Customizing_the_Palette_howto;Form_Designer_F1;binding_code_to_a_form_component_howto;deleting_objects_from_the_object_library_howto;Adding_Bean_to_Library_howto;adding_objects_to_the_palette_howto;deleting_objects_from_the_palette;Palette_F1',0,','')} {button See  
Also,AL("Projects_overview;Understanding_Visual_Components;Using_Visual_Caf_as_Your_Development_Environment;Overview_of_Visual_Caf',0,','')}
```

The Component Library is a repository for storing, organizing, and displaying [components](#) and [project templates](#). When you first install Visual Cafe, all of the standard Java components plus many additional Symantec components and project templates are displayed in the Component Library.

You can customize the Component Library by adding third-party components and your own custom components and project templates. For example, if there is a certain type of [form](#) you use often, you can design it then add it to the library. The form, including the components it contains and its properties, are added. You can also select a library component and modify its properties in the Property List.

You can think of the items in the Component Library as “reusable.” Once you design them, you can use them in your projects as needed. For example, you can start a new project with a project template you designed, and you can drag components from the library into the Project window or Form Designer to use them in a project.

To add components to the library, choose Insert ► Component into Library and insert a [jar](#) or [class](#) file. Or drag and drop a [jar](#) or [class](#) file from a file system window, such as the Explorer. After you add a component, you should not move its corresponding [jar](#) or [class](#) file, because Visual Cafe looks for it in that location. If you move the location of a [jar](#) or [class](#) file for a component you already added to the library, you should re-add the component.

**Note** Some components are made of more than one [class](#) file, such as if the Java source file for a component has [inner classes](#). You need to make sure these [class](#) files are in the class path. You do not need to add inner classes to the Component Library.

You can also create a component template by dragging a component from the Project window (Objects view) to the Component Library. The source file is copied by Visual Cafe, so you do not have to keep the files in the same location. A component and a component template appear the same in the Component Library, and you add them to projects in the same way.

To create a project template, design your project and while the Project window is active, choose Project ► Create Project Template. The project files should all be in one directory; they are copied, so you do not have to leave the files in a particular location.

At the top of the main Visual Cafe window is the [Component Palette](#), which you can also undock. You can think of the Component Palette as another view of the Component Library, but with easier access and more customization capabilities. The Component Library contains everything that the Component Palette contains, but the Component Library can contain more. To customize the Component Palette, you can add components from the Component Library or Project window, delete components, and group components in different arrangements.

### To display the Component Library

- Choose View (or Window) ► Component Library.

### Tasks

[Adding components to a form](#)

[Adding components to a project](#)

[Adding a component to the Component Library](#)

[Adding a bean to the Component Library](#)

[Adding a project template to the Component Library](#)

[Adding a group to the Component Library](#)

[Viewing and changing component properties](#)

[Moving components in the Component Library](#)

[Deleting components from the Component Library](#)

[Adding components to the Component Palette](#)

## Using JAR files in Visual Cafe

```
{button How To,AL('Adding_Bean_to_Library_howto',0,'')} {button See  
Also,AL('Add_to_Library_dialog_F1;Adding_Files_to_a_Project_howto;Adding_objects_to_project_howto;Creating_a_Project_ho  
wto;Forms_adding_objects;Customizing_the_Palette_howto;Creating_beans_overview',0,'')}
```

A Java Archive (JAR) file is a compressed archive file that complies with the [JavaBeans](#) standard. It is the primary method for delivering [JavaBeans components](#). For example, a JAR file can contain one or more related beans, and any support files, including classes, icons, graphics, sounds, HTML documentation, serialization files, and internationalization files. You can also deploy applets and applications from a JAR file. A JAR tool, called jar.exe on Windows computers, archives and extracts JAR files and is provided with JDK 1.1.

In Visual Cafe, to use the JavaBeans components in a JAR file, you must first add the file to the Component Library. Then you can add the components to your projects. If HTML documentation was included in the JAR for a bean and you want to look at it, you need to expand the JAR by using jar.exe.

### Note

- When you add a [JAR file](#) to the Component Library, all JavaBeans components in the JAR file are added (as specified in the [manifest file](#) ). You cannot remove one component independently of the others in the JAR file.
- You cannot add ZIP files to the Component Library.

To create a JAR file from Visual Cafe, choose Project ► JAR. See [Creating a JAR file](#) for more information. To expand a JAR, see [Expanding a JAR file](#). To view the contents of a JAR file, see [Viewing a JAR file](#).

To specify a JAR file in an HTML file, add the variable `ARCHIVE="name.jar"` to the applet tags. You can specify multiple JAR files by delimiting them with a comma (,).



## Adding a group to the Component Library

```
{button Concepts,AL(^Using_JAR_files_overview;Object_Library_F1',0,',')} {button See  
Also,AL(^Adding_Bean_to_Library_howto;Add_to_Library_dialog_F1;Adding_Files_to_a_Project_howto;Adding_objects_to_proje  
ct_howto;Creating_a_Project_howto;Forms_adding_objects;Customizing_the_Palette_howto;Creating_beans_overview',0,',')}
```

Components are stored in groups, represented by a folder icon, so you can organize your components.

1. Choose Insert ► Group, or right-click the Component Library and choose Insert Group.
2. Type the group name.

## Adding a component to the Component Library

```
{button Concepts,AL('Using_JAR_files_overview;Object_Library_F1',0,','')} {button See  
Also,AL('Adding_Bean_to_Library_howto;Add_to_Library_dialog_F1;Adding_Files_to_a_Project_howto;Adding_objects_to_proje  
ct_howto;Creating_a_Project_howto;Forms_adding_objects;Customizing_the_Palette_howto;Creating_beans_overview',0,','')}
```

To add a [component](#) to the [Component Library](#), you can insert a [class](#) or [jar](#) file, or drag a component from a file system window into the Component Library. The component must be a [JavaBeans component](#) that complies with the [JavaBeans](#) standard for it to be added.

**IMPORTANT** After you add a component, you should not move its corresponding **class** or **jar** file, because Visual Cafe looks for it in that location. If you move the component, you should re-add it to the library. Some components are made of more than one **class** file, such as if the Java source file for a component has [inner classes](#). You need to make sure these **class** files are in the class path. You do not need to add inner classes to the Component Library.

You can also create a component template by dragging a component from the Project window (Objects view) to the Component Library. The source file is copied by Visual Cafe, so you do not have to keep the files in the same location. A component and a component template appear the same in the Component Library, and you add them to projects in the same way.

**Note** When you add a [JAR file](#) to the Component Library, all JavaBeans components in the JAR file are added (as specified in the [manifest file](#)). You cannot remove one component independently of the others in the JAR file.

### To insert a component

You can insert a **class** or **jar** file.

#### ▶ [Details on inserting a component](#)

##### To add a component from a file system window

- Drag a **class** or **jar** file from a file system window (such as the Explorer) to the location you want it in the Component Library.

##### To add a component template from the Project window

- Drag a component from the Project window (Objects tab) to the location you want it in the Component Library.

## Adding a bean to the Component Library

```
{button Concepts,AL(^Using_JAR_files_overview;Object_Library_F1',0,',')} {button See  
Also,AL(^Adding_Bean_to_Library_howto;Add_to_Library_dialog_F1;Adding_Files_to_a_Project_howto;Adding_objects_to_proje  
ct_howto;Creating_a_Project_howto;Forms_adding_objects;Customizing_the_Palette_howto;Creating_beans_overview',0,',')}
```

To use a [JavaBeans component](#), you must add it to the Component Library. You can add [class](#) or [jar](#) files. The bean must comply with the [JavaBeans](#) standard for it to be added. After you add a bean:

- The component will appear in the Component Library.
- If an icon was specified in the BeanInfo, the component uses that icon. If the BeanInfo getIcon method returns NULL, Visual Cafe uses the icon of a base class already in the Component Library. Visual Cafe examines the classes the JavaBeans component inherits from, and picks the class deepest in the inheritance hierarchy. The icon of this class is used with your new JavaBeans component.
- If the get and set methods conform to the JavaBeans design pattern, the component properties will appear in the Property List window. You can edit custom properties as a text field, a drop-down list, or in a dialog box, depending on the property. The dialog box appears if you click a field value, then click the ... button.
- Visual Cafe derives the interactions displayed in the Interaction Wizard. It determines the interactions through Java introspection:
  - The interactions are specified in the BeanInfo class.
  - If the interactions are not specified in the BeanInfo class, Visual Cafe uses reflection to look at the public methods and derives interactions from them.

**Note** When you add a [JAR file](#) to the Component Library, all JavaBeans components in the JAR file are added (as specified in the [manifest file](#)). You cannot remove one component independently of the others in the JAR file.

To add a JavaBeans component to the Component Library, follow these steps:

1. Make sure the component **class** or **jar** file is in the location you want to store it.  
**IMPORTANT** For class files, this location must be in your class path. For example, \\VisualCafe\\java\\lib is in your class path. Remember that class files are case-sensitive. If you want to add the class file to a package, the class file must be in the package directory.
2. Choose Insert ► Component into Library.  
This menu item is available only when a project is open.  
An Open dialog box displays.
3. Select the **class** or **jar** file, then click Open.  
For a **class** file, an Add to Library dialog box displays.  
For a **jar** file, Visual Cafe inserts the beans into the Component Library. The beans are put in a group with the same name as the **jar** file, unless another group name was specified in the bean.
4. For a **class** file, select a group, then click OK.  
The component appears in the Component Library. You should verify that it is there. (You can display the Component Library by choosing View or Window ► Component Library.)

### Note

- If a bean is not added to the Component Library, it most likely does not comply with the JavaBeans standard.
- If you change or move a **class** or **jar** file after it is in the Component Library, the change is not recognized until you restart Visual Cafe, or you re-add it.
- Some components are made of more than one **class** file, such as if the Java source file for a component has [inner classes](#). You need to make sure these **class** files are in the class path. You do not need to add inner classes to the Component Library.



## ▶ Creating JavaBeans components in Visual Cafe

```
{button Concepts,AL(^Using_JAR_files_overview;Object_Library_F1;Projects_overview',0','')} {button See  
Also,AL(^Add_to_Library_dialog_F1;Adding_Files_to_a_Project_howto;Adding_objects_to_project_howto;Creating_a_Project_ho  
wto;Forms_adding_objects;Customizing_the_Palette_howto;Adding_Bean_to_Library_howto',0','')}
```

You can create [JavaBeans components](#) within the Visual Cafe environment. Visual Cafe provides tools to make your job easier.

**Tip** You can create a component template by dragging a component from the Project window (Objects view) to the Component Library. The source file is copied by Visual Cafe, so you do not have to keep the files in the same location. A component and a component template appear the same in the Component Library, and you add them to projects in the same way.

1. Create a new project for developing one or more [JavaBeans](#) components.

Get started quickly with the Bean Wizard.

### ▶ [Details on using the Bean Wizard](#)

2. If you are converting a custom component that has a description file, convert the description file.

### ▶ [Details on this step](#)

3. Create the [bean](#) according to the JavaBeans standard.

This includes adding to the project any support files, such as classes, icons, graphics, sounds, HTML documentation, serialization files, and internationalization files. If you add support files to the project, they are automatically included when you create a JAR file from the project with the Visual Cafe JAR utility.

4. Optionally add to the BeanInfo some information for better integrating into the Visual Cafe environment.

### ▶ [Details on this step](#)

5. To package the bean(s) in a [JAR file](#), choose Project ▶ JAR.

### ▶ [Details on this step](#)

**Note** When you add a JAR file to the Component Library, all JavaBeans components in the JAR file are added (as specified in the [manifest file](#)). You cannot remove one component independently of the others in the JAR file.

6. To use and test the bean within the Visual Cafe environment, add it to the Component Library.

### ▶ [Details on this step](#)

If you use JavaBeans components you created in a new project, you can update your component project file and have the changes applied to any project that uses the component. See [Dynamically developing JavaBeans components in Visual Cafe](#) for more information.

## Using the Bean Wizard to create a JavaBean

```
{button Concepts,AL('Working_with_Templates_overview;Creating_beans_overview',0,'','concept')} {button See  
Also,AL('Creating_a_Project_howto;Creating_a_Template_howto;Deleting_Templates_from_the_Object_Library_howto;Adding_  
Bean_to_Library_howto',0,'','visual')}
```

Visual Cafe provides a wizard that helps you create a basic bean. The wizard creates two files: *beanclass*BeanInfo.java and *beanclass*.java where *beanclass* is the name of your bean.

The Bean Wizard consists of approximately seven steps:

- Choose a bean name
- Choose a bean type
- Choose a bean weight or base class (if creating a custom bean)
- Select override methods (optional)
- Add properties (optional)
- Add icons (optional)
- Review your choices

Each step contains instructions.

To learn more about JavaBeans, refer to the Sun Microsystems JavaBeans API specification.

### To start the Bean Wizard

1. Choose File ► New Project.
2. Select Bean Wizard and click OK.

### Note

- Composite beans have an override of AddImpl that does nothing. This makes composite beans reject any attempt to add items to them.
- The icons also get added to your project, in the Files tab. This allows them to be added to the JAR when building your project.

## Dynamically developing JavaBeans components in Visual Cafe

```
{button Concepts,AL('Using_JAR_files_overview;Creating_beans_overview ;Object_Library_F1;Projects_overview',0,'')}  
{button See
```

```
Also,AL('Add_to_Library_dialog_F1;Adding_Files_to_a_Project_howto;Adding_objects_to_project_howto;Creating_a_Project_ho  
wto;Forms_adding_objects;Customizing_the_Palette_howto;Adding_Bean_to_Library_howto;viewing_jar_howto',0,'')}
```

Visual Cafe enhances the development of [JavaBeans components](#) by providing a single command that immediately shows updates made to components. After modifying the form, source code, or events in your JavaBeans components, use AutoJAR to update the [JAR file](#). You will quickly see the results of those modifications in real time as any open projects using those components are automatically updated.

The following steps describe preparing a JavaBeans component for dynamic development.

1. Create a bean using the Bean Wizard.

▶ [Details on this step](#)

**Tip** If you choose to use already created source code by adding a source file to the project, you need to include a corresponding *BeanName*BeanInfo.java file, where *BeanName* is the name of your bean. See [Using AutoJAR with JavaBeans components](#) for a description of the file pattern.

2. Choose Project ▶ AutoJAR.

▶ [Details on this step](#)

3. Open a different project and add your new JavaBeans component(s).

The following steps describe the process of dynamic development with JavaBeans components.

1. Make any modifications to the form, source code, or events of the project containing the bean.
2. Choose Project ▶ AutoJAR again to update the JavaBeans component(s) in the Component Library and all instances of the component in any open projects.

If your project is not open at the time you run AutoJAR, all instances of your components are updated the next time you open that project.

**Note** If you manually replace a JAR file added to the Component Library, all instances of components in the JAR that are in any open projects are automatically updated.

## ▶ Creating a JAR file by using AutoJAR

```
{button
Concepts,AL(^Using_JAR_files_overview;Creating_beans_overview ;dynamic_beans_develop_howto;Object_Library_F1;Project
s_overview',0,';')} {button See
Also,AL(^Add_to_Library_dialog_F1;Adding_Files_to_a_Project_howto;Adding_objects_to_project_howto;Creating_a_Project_ho
wto;Forms_adding_objects;Customizing_the_Palette_howto;Adding_Bean_to_Library_howto;viewing_jar_howto',0,';')}
}
```

Visual Cafe provides a tool you can use within its environment to automatically create [JAR files](#) from a project, which is particularly useful for packaging [beans](#). AutoJAR performs the following actions:

- saves source files
- compiles source files into class files
- creates a JAR file with a [manifest file](#)
- adds beans in the JAR to the Component Library
- updates any open projects that use the component(s)

**Note** If your project is not open at the time you run AutoJAR, all instances of your components are updated the next time you open that project.

The manifest file generated by AutoJAR automatically includes the following attributes for class files that follow this pattern:

- If a *name*.class file has a corresponding *name*BeanInfo.java file, Visual Cafe will automatically set that class file to be a bean. It will have the attribute and value of Java-Bean:True. For example, if there is a MybeanBeanInfo.java file, Mybean.class will be marked as Java-Bean:True.
- If a class file has a corresponding *name*BeanInfo.java, *name*Customizer.java, or *name*Editor.java file, Visual Cafe automatically marks the file as Design Time Only. It will have the attribute and value of Design-Time-Only:True. For example, if the class file MybeanBeanInfo.class has a corresponding MybeanBeanInfo.java file, the file will be marked as Design-Time-Only:True.

**Tip** If you want non-Java files to be automatically included in your JAR, you should add them to the project. Ideally, these files should be in the project directory, project output directory, or subdirectories of these directories; otherwise, Visual Cafe might not be able to determine the correct package name.

You can also create a JAR with the JAR Packager tool, as described in [Creating a JAR file by using the JAR Packager](#). The JAR Packager gives you more control over how the JAR is created.

To use AutoJAR:

1. If needed, set up the Bundler.properties file so it contains the JAR options you want.

▶ [Details on this step](#)

2. Choose Project ▶ AutoJAR.

The JAR file is placed in the output directory and has the same name as the project.

## Creating a JAR file by using the JAR Packager

```
{button Concepts,AL(^Using_JAR_files_overview;Object_Library_F1;Projects_overview',0,','')} {button See  
Also,AL(^Add_to_Library_dialog_F1;Adding_Files_to_a_Project_howto;Adding_objects_to_project_howto;Creating_a_Project_ho  
wto;Forms_adding_objects;Customizing_the_Palette_howto;Adding_Bean_to_Library_howto;Autojar_howto;viewing_jar_howto',  
0,','')}
```

Visual Cafe provides a JAR Packager tool you can use within its environment to quickly create [JAR files](#). The JAR Packager sets up much of the JAR for you. Initially, the display includes all of the classes in your project, any classes they depend on, and other files you have added to the project. You can also create JAR files with the AutoJAR tool, as described in [Creating a JAR file using AutoJAR](#). AutoJAR creates the JAR faster but does not give you as much control over the JAR output.

Remember that when you add a JAR file to the Component Library, all [JavaBeans components](#) in the JAR file are added (as specified in the [manifest file](#)). You cannot remove one component independently of the others in the JAR file.

Also, you cannot add to an existing JAR file, but you can create a new JAR file from a project.

**Tip** If you want non-Java files to be automatically included in your JAR, you should add them to the project. Ideally, these files should be in the project directory, project output directory, or subdirectories of these directories; otherwise, Visual Cafe might not be able to determine the correct package name.

To create a JAR:

1. If needed, set up the Bundler.properties file so it contains the JAR options you want.

▶ [Details on this step](#)

2. Make sure your environment options are set to the release type you want, either Debug or Final.  
By default, when the release type is Debug, all dependent files that are in archive files (JAR/ZIP) are not included in the JAR. By default, these files are included when the release type is Final.
3. Activate the project you want to work with, then choose Project ▶ JAR.  
Visual Cafe saves the source files and compiles the files in the project.

4. If you use Swing components in the project, you may be prompted to specify the look and feel you want to use. Select the items you want, then click OK.

The JAR Packager appears. The panel on the left shows the files in your JAR. The panel on the right is where you specify information about the files listed on the left. You can resize the JAR tool by clicking and dragging any of the edges of the dialog box.

5. In the JAR File field, type the name and full path that you want the JAR file to have. Click the ... button to choose a path from a dialog box.

6. Add or remove files as needed.
  - To add files to the JAR, select a file and click Add File.

▶ [Details on adding files to a JAR](#)

- To remove files from the JAR, select one or more files and click Exclude Files.
- To add or remove files, packages, and archives that were automatically added to the JAR when you started the JAR tool, click Manage Files.

▶ [Details on managing files](#)

7. To specify information about a file, select a file in the left panel and specify the option in the right panel:

- To specify a package, type it in the Package field.

Visual Cafe tries to specify the correct package for you. However, if a file is not in the project directory, project output directory, or subdirectories of these directories, Visual Cafe might not be able to determine the correct package name.

- To identify a class file as a [bean](#), select Java Bean.

If a *name.class* file has a corresponding *nameBeanInfo.java* file, Visual Cafe will automatically set that class file to be a bean. For example, if there is a *MybeanBeanInfo.java* file, *Mybean.class* will be marked as a Java Bean.

- Select Design Time Only if a class file is needed only at design time, such as a *BeanInfo* file, which is used when you add a JAR to the Component Library.

If a class file has a corresponding *nameBeanInfo.java*, *nameCustomizer.java*, or *nameEditor.java* file, Visual Cafe automatically marks the file as Design Time Only. For example, if the class file *MybeanBeanInfo.class* has a corresponding *MybeanBeanInfo.java* file, the file will be marked as Design Time Only.

- To specify dependencies within the JAR, click Add and select a file that the class depends on, such as a graphics file or another support file. (This command is the same as the depends flag in the manifest file.)

**Note** The file must be listed in the left panel before you can specify dependencies with it; clicking Add does not let you add files.

8. To create a compressed JAR file, select Compressed.

**Tip** You probably do not want to add a compressed JAR file to the Component Library because it takes more time for the development environment to access the files in the JAR. Also, some browsers may not support compressed JAR files.

9. To automatically add the beans in the JAR to the Component Library, click Add to Library.

10. Click OK to create the JAR.

## Adding files to a JAR

```
{button Concepts,AL(^Using_JAR_files_overview;Object_Library_F1;Projects_overview',0,','')} {button See  
Also,AL(^Add_to_Library_dialog_F1;Adding_Files_to_a_Project_howto;Adding_objects_to_project_howto;Creating_a_Project_ho  
wto;Forms_adding_objects;Customizing_the_Palette_howto;Adding_Bean_to_Library_howto',0,','')}
```

While creating a [JAR file](#) with the JAR Packager tool, you can add additional files to the JAR that may not be in your current project, such as a GIF or an HTML file, as well as additional class files.

**Tip** If you want non-Java files to be automatically included in your JAR, you should add them to the project. Ideally, these files should be in the project directory, project output directory, or subdirectories of these directories; otherwise, Visual Cafe might not be able to determine the correct package name.

To add files to a JAR:

1. Click Add File.  
The Select File dialog box is displayed.
2. Select a file to add and click OK.
3. If needed, change the package in the Package field.
4. Repeat steps 1 and 2 to add additional files.



**Note** The Select File dialog box does not allow selection of multiple files.

## Managing files in a JAR

```
{button Concepts,AL(^Using_JAR_files_overview;Object_Library_F1;Projects_overview',0','')} {button See  
Also,AL(^Add_to_Library_dialog_F1;Adding_Files_to_a_Project_howto;Adding_objects_to_project_howto;Creating_a_Project_ho  
wto;Forms_adding_objects;Customizing_the_Palette_howto;Adding_Bean_to_Library_howto',0','')}
```

Visual Cafe provides the JAR Packager, a tool you can use within its environment to quickly create [JAR files](#). If you have excluded a package or archive while creating a JAR, but need a file contained in that package or archive in the JAR, Manage Files allows you to add the file back in. You can also remove all files at once from a package or archive.

To manage your files, packages, and archives:

1. Click Manage Files.  
The Manage Files dialog box is displayed.
2. Select the Files, Packages, or Archives tab to manage what items are excluded or added.
3. Add any items you have excluded back into the JAR by double-clicking it or using the Add button .
4. Remove any items you no longer want in the JAR by double-clicking it or using the Remove button .
5. Click OK to save the changes or Cancel to remove the changes.

**Note** You can select multiple files by pressing Shift while clicking the files.



## Specifying JAR options in the Bundler.properties file

```
{button Concepts,AL(^Using_JAR_files_overview;Object_Library_F1;Projects_overview',0,'')} {button See  
Also,AL(^Add_to_Library_dialog_F1;Adding_Files_to_a_Project_howto;Adding_objects_to_project_howto;Creating_a_Project_ho  
wto;Forms_adding_objects;Customizing_the_Palette_howto;Adding_Bean_to_Library_howto;Autojar_howto;viewing_jar_howto;  
Creating_jar_howto',0,'')}
```

Visual Cafe provides JAR Packager and AutoJAR tools you can use within its environment to quickly create [JAR files](#). These tools set up much of the JAR for you. You can customize how you want your JAR files to be set up by configuring a Bundler.properties file located in the Visual Cafe \javallib directory. A default file is provided.

### To preserve your JAR Packager settings

If you make changes in the JAR Packager, the changes in the bottom panel are always preserved. If you also want to preserve changes you make in the upper two panels, set PersistData to true:

```
PersistData=true
```

The default is false.

### To change what archive files are included in JARs for Debug and Final release types

By default, when the release type is Debug, all dependent files that are in archive files (JAR/ZIP) are not included in the JAR. By default, these files are included when the release type is Final.

To include these dependent archive files in Debug builds, set IgnoreArchivesInDebug to false:

```
IgnoreArchivesInDebug=false
```

To not include these dependent archive files in Final builds, set IgnoreArchivesInFinal to true:

```
IgnoreArchivesInRelease=true
```

### To create a JAR even if there are compiler warnings

By default, a JAR tool will not create a JAR if there are compiler warnings. To create a JAR despite compiler warnings, set TestSJOutput to false:

```
TestSJOutput=false
```

### To include or exclude Swing classes

By default, if you use Swing components in your project, Swing classes are included in your JAR. However, including these classes can make your JAR quite large and your users may already have the Swing classes on their computers. In this case, you could exclude Swing classes by setting Swing.include to false:

```
Swing.include=false
```

If the IgnoreArchivesInDebug (default true) or IgnoreArchivesInRelease (default false) is set to true, the Swing classes are not included even if Swing.include is set to true.

### To prompt for Swing look and feels

By default, the JAR Packager prompts for Swing look and feels:

```
Swing.promptForLAFs=true
```

Before it prompts, however, the Swing classes need to be included in the JAR. That means the IgnoreArchivesInDebug or IgnoreArchivesInFinal property needs to be set to true for the corresponding release type you are using when generating the JAR, and Swing.include must be true. If either of these properties are false, the Swing classes are not included, so you are not prompted.

You can also specify the default look and feels, described next.

### To specify the default Swing look and feels

With the Swing.defaultLAFs property, you can set default Swing look and feels to include when you create a JAR with the JAR or Auto JAR commands.

```
Swing.defaultLAFs=metal,motif
```

If `Swing.promptForLAFs=true`, these defaults appear in the dialog box when you create a JAR with the JAR Packager.

The values must be listed in the `Swing.LAFs` section. Here are the defaults:

```
# - These Swing look and feels are required. If the requirements change,
# - you can specify the change here.
Swing.mandatory.LAFs=plaf,basic
Swing.mandatory.LAF.plaf=swingall.jar
Swing.mandatory.LAF.plaf.base=com/sun/java/swing/plaf
Swing.mandatory.LAF.basic=swingall.jar
Swing.mandatory.LAF.basic.base=com/sun/java/swing/plaf/basic

# - These Swing look and feels are optional. You can remove the settings you
# - don't want to use or specify additional values.
Swing.LAFs=metal,motif,windows
Swing.LAF.metal=swingall.jar
Swing.LAF.metal.base=com/sun/java/swing/plaf/metal
Swing.LAF.motif=swingall.jar
Swing.LAF.motif.base=com/sun/java/swing/plaf/motif
Swing.LAF.windows=swingall.jar
Swing.LAF.windows.base=com/sun/java/swing/plaf/windows
```

#### **To specify where to look for Swing JAR files**

By default, Visual Cafe looks in the Visual Cafe Jfc directory for the Swing JAR files. You can use the `Swing.home` property to change this location if you have your JFC files somewhere else. For example, to set the directory to `c:\jars`:

```
Swing.home=c:/jars
```

#### **To display the JAR Packager version number**

By default, the JAR Packager version number appears in the JAR Packager title bar. To disable the display, set the `DisplayVersion` property to `false`:

```
DisplayVersion=false
```

#### **To gather data for Symantec Technical Support to use for troubleshooting**

During normal operation, the `Debug` and `KeepFiles` properties should be set to `false`. This is the default. If you need to gather troubleshooting information, you can set them to `true`:

```
Debug=true
KeepFiles=true
```

When `Debug` is `true`, debug logging starts. When the `KeepFiles` property is `true`, Visual Cafe keeps the intermediate files (bundler.dar and bundler.rsp) that the JAR Packager generates so Technical Support can examine them.

By default, the debug log is kept in `c:\Debug.log`. You can change this location and name with the `DebugLog` property. For example:

```
DebugLog=C:/MyDebug.log
```

#### **Sample file**

Here is a sample `Bundler.properties` file that shows the current default values.

```
# - Example Bundler.properties file (3.1.0).
# - All of the entries show the default values (except for Swing.home,
# - which is commented out).

# - Turn off the debug logging.
# - (True is useful for Symantec Technical Support when troubleshooting.)
Debug=false

# - Write to this debug file when Debug=true.
```

```
DebugLog=C:/Debug.log

# - Fail when a build gives warnings.
TestSJOutput=true

# - Do not keep the intermediate files that the JAR Packager generates.
# - This includes bundler.dar and bundler.rsp.
# - (True is useful for Symantec Technical Support when troubleshooting.)
KeepFiles=false

# - Do not save the included/excluded class lists and other information
# - specified in the upper two panels of the JAR Packager.
PersistData=false

# - Display the JAR Packager version number in the title bar.
DisplayVersion=true

# - For Debug builds, exclude files that come from JAR/ZIP files.
IgnoreArchivesInDebug=true

# - For Final builds, include files that come from JAR/ZIP files.
IgnoreArchivesInRelease=false

# - Include Swing classes (this effects all Swing options).
# - If an IgnoreArchivesIn property is true, then Swing
#   is excluded regardless.
Swing.include=true

# - Look here for the Swing JAR files.
# - You only need to set this if your JFC files are not
#   located in the <VisualCafeInstall>\jfc directory.
# Swing.home=c:/jars

# - When choosing Project>JAR, display a dialog box of LAFs to select from.
# - Auto JAR does not use this.
Swing.promptForLAFs=true

# - Here are the default Swing LAFs to include when you create a JAR with
# - the JAR or Auto JAR commands. If Swing.promptForLAFs=true, these defaults
# - are displayed in the dialog box. The values must be listed in the SwingLAFs
# - section below.
Swing.defaultLAFs=metal,motif

# - These Swing look and feels are required. If the requirements change,
# - you can specify the change here.
Swing.mandatory.LAFs=plaf,basic
Swing.mandatory.LAF.plaf=swingall.jar
Swing.mandatory.LAF.plaf.base=com/sun/java/swing/plaf
Swing.mandatory.LAF.basic=swingall.jar
Swing.mandatory.LAF.basic.base=com/sun/java/swing/plaf/basic

# - These Swing look and feels are optional. You can remove the settings you
# - don't want to use or specify additional values.
Swing.LAFs=metal,motif,windows
```

```
Swing.LAF.metal=swingall.jar
Swing.LAF.metal.base=com/sun/java/swing/plaf/metal
Swing.LAF.motif=swingall.jar
Swing.LAF.motif.base=com/sun/java/swing/plaf/motif
Swing.LAF.windows=swingall.jar
Swing.LAF.windows.base=com/sun/java/swing/plaf/windows
```



## Expanding a JAR file

{button Concepts,AL(^Using\_JAR\_files\_overview;Object\_Library\_F1;Projects\_overview',0,'')} {button See Also,AL(^Add\_to\_Library\_dialog\_F1;Adding\_Files\_to\_a\_Project\_howto;Adding\_objects\_to\_project\_howto;Creating\_a\_Project\_howto;Forms\_adding\_objects;Customizing\_the\_Palette\_howto;Adding\_Bean\_to\_Library\_howto;viewing\_jar\_howto',0,'')}

Visual Cafe provides a tool you can use within its environment to quickly create [JAR](#) files. To expand JAR files, use the jar.exe utility in the java\bin subdirectory. For example, to expand the file Amazing.jar, enter the following at a DOS prompt:

```
jar -xf Amazing.jar
```



## Viewing a JAR file

```
{button Concepts,AL(^Using_JAR_files_overview;Object_Library_F1;Projects_overview',0','')} {button See  
Also,AL(^Add_to_Library_dialog_F1;Adding_Files_to_a_Project_howto;Adding_objects_to_project_howto;Creating_a_Project_ho  
wto;Forms_adding_objects;Customizing_the_Palette_howto;Adding_Bean_to_Library_howto',0','')}
```

Visual Cafe provides a JAR Viewer tool that you can use within its environment to quickly view [JAR](#) files.

### To look at the contents of a JAR file

- Choose Tools ► JAR Viewer.

Within the JAR Viewer you can:

- Sort the JAR contents by clicking the title of the column you want to determine the sort order. Click the column title again to reverse the sort order.
- View the manifest of a class file in the JAR by double-clicking the selected file or choosing View.
- View the manifest of multiple files by selecting the files and clicking View.
- Hide the manifest display by clicking Hide Manifest Display. Click Show Manifest Display to reveal the manifest display.
- Hide the zip/jar display by clicking Hide Zip Display. Click Show Zip Display to reveal the zip display.

## Adding Visual Cafe information to a bean

```
{button Concepts.AL('Using_JAR_files_overview;Object_Library_F1',0,','')} {button See  
Also.AL('Adding_Bean_to_Library_howto;Add_to_Library_dialog_F1;Adding_Files_to_a_Project_howto;Adding_objects_to_proje  
ct_howto;Creating_a_Project_howto;Forms_adding_objects;Customizing_the_Palette_howto;Creating_beans_overview',0,','')}
```

JavaBeans has *introspection*, the ability to read JavaBeans classes directly with the Core Reflection API using the Introspector class. This information is stored in a BeanInfo object and includes data such as properties, events, and all the accessible methods. In addition, you can add information about how a bean should integrate into the Visual Cafe environment. The integration information is provided through two Visual Cafe classes: `symantec.itools.beans.SymantecBeanDescriptor` and `symantec.itools.beans.ConnectionDescriptor`.

A quick description and code samples follow; for more information, see the Java API reference, which is available from the Help menu.

### SymantecBeanDescriptor

The `SymantecBeanDescriptor` class extends from `java.beans.BeanDescriptor` and is the main way to supply Visual Cafe integration information. The `SymantecBeanDescriptor` methods let you tell the Visual Cafe environment about the following:

- The name of a Component Library group (folder) to put the bean in
- The name of a Component Palette tab to put the bean in
- Whether to not allow users to drop other components into this bean (if this bean derives from `java.awt.Container`)
- Visual Cafe flags, such as `INVISIBLE` for specifying [invisible components](#)
- Visual Cafe connections (used by the Interaction Wizard) that are not tied to a specific method

### ConnectionDescriptor

The `ConnectionDescriptor` class extends from `java.beans.FeatureDescriptor`. A `ConnectionDescriptor` encapsulates a Visual Cafe connection, which is used by the Interaction Wizard. A Visual Cafe connection defines an interaction, or connection, for a bean. It implies a relationship between objects (or between an object and itself) involving either event notification or data transmission. The Interaction Wizard allows users to graphically build these relationships between objects, and Visual Cafe is able to generate the code for the specified relationship based on the underlying connection information encapsulated in the `ConnectionDescriptor`.

The connection is made of five pieces:

- **form** — Determines whether the value of a connection is `INPUT` or `OUTPUT`. An input connection defines an interaction that sets data or initiates the execution of a method; an output connection defines an interaction that returns data.
- **type** — Sets the Java type of the input or output value of the connection.
- **expression** — Defines the code that is generated to create the connection. Properties and the following replacement variables are allowed in the code string:
  - `%name%` — name of the class/component
  - `%class%` — full class name of the class/component
  - `%arg%` — method argument used for output connection data
- **initialization** — Defines any initialization code that needs to be present prior to the code generated from the connection expression.
- **description** — Supplies an English description of the connection. This string appears in the Interaction Wizard. `%class%` is allowed.

A Visual Cafe connection looks like a method call. However, a connection can be more than that. It can be a “meta-method.” Any valid code expression can be used to generate the connection, for example, the connection “Toggle pause” might have `%name%.setPaused(!%name%.isPaused());` as the code expression. (In this expression, `%name%` is a replacement variable for the name of the component class). A connection does not have to be tied to a method, for example, the connection “Point the button arrow LEFT” might have the code expression `%name%.LEFT`.

The `ConnectionDescriptor` methods allow you to set the form, type, expression, initialization, and description of a particular connection. If a connection is tied to a specific method, its `ConnectionDescriptor` is associated with that method's `MethodDescriptor`. Currently, the association uses the `MethodDescriptor`'s inherited method `setValue`, passing in a `Vector` of all `ConnectionDescriptor` objects to be associated with that method. All connections that are not tied to a specific method have their `ConnectionDescriptor` objects associated with the bean's `SymantecBeanDescriptor` object.

### Code Samples

Following are three code samples that show three different ways of implementing the `BeanInfo` information specific to Visual Cafe. Here is the first sample:

```
public BeanDescriptor getBeanDescriptor() {
```

```

SymantecBeanDescriptor bd = new SymantecBeanDescriptor(beanClass);

bd.setCanAddChild(false);
bd.setFolder("Additional");
bd.setToolBar("Additional");

bd.addConnectionDescriptor(new ConnectionDescriptor("output", "int", "",
"%name%.BORDER_REGULAR",
"BORDER_REGULAR"));

bd.addConnectionDescriptor(new ConnectionDescriptor("output", "int", "",
"%name%.BORDER_NONE",
"BORDER_NONE"));

return (BeanDescriptor) bd;
}

```

Here is a second style:

```

ConnectionDescriptor cd = new ConnectionDescriptor( );
cd.setForm(ConnectionDescriptor.OUTPUT);
cd.setType("int");
cd.setExpr("%name%.BORDER_NONE" );
cd.setShortDescription("BORDER_NONE");

bd.addConnectionDescriptor(cd);

```

Here is a third style:

```

ConnectionDescriptor cd = new ConnectionDescriptor(ConnectionDescriptor.OUTPUT );
cd.setType("int");
cd.setExpr("%name%.BORDER_NONE" );
cd.setShortDescription("BORDER_NONE");

bd.addConnectionDescriptor(cd);

```



## Converting component description files to JavaBeans

```
{button Concepts,AL('Description_File_overview',0,'')} {button See
Also,AL('Example_desc_file;Adding_Bean_to_Library_howto',0,'')}
```

Visual Cafe provides a utility for converting Visual Cafe description files so you can implement the [JavaBeans](#) standard with your custom components.

1. Run the Description File Converter.
 

To do so, double-click the \Bin\DescToBeanInfo.bat batch file, which is in the DescFileConverter directory of the main Visual Cafe directory.

The Description File Converter dialog box appears. You can view the Java version by choosing Help ▶ Environment.
2. Click the Location tab.
3. In the Description File Directory field, specify the full path to the directory containing one or more description files you want to convert. You can use the Browse button to specify the directory.
4. If the component icons are with the description files, select **.ico files are with .desc files**. Otherwise, in the Icon File Directory field, specify the location of the corresponding icon files, if present.
5. In the Output Directory field, specify the full path to a directory where you want your output files (BeanInfo and gif) to go.
 

When the description file is converted, the name of the output file is the first part of the bean name (without the extension) appended with **BeanInfo.java**; the icon files are converted to **gif** files.
6. Select relative or absolute.
 

If you select relative, the fully qualified class name is used to create a directory structure subordinate to the output directory. For example, if the output directory is c:\temp and the class name is symantec.beans.Beans, Beans.java will be placed in the directory c:\temp\symantec\beans.



If you select absolute, all files are placed in the directory you specify. This could potentially cause file name conflicts, because the package directory structure is not preserved.

7. Click the Selection tab and select the files you want to convert. Shift-click to select multiple files. Select **select all listed files** to select all files.
8. Choose File ► Convert.

A dialog box appears when the conversion is complete. The files appear in the output directory; if the path was relative, the files are in a directory subordinate to the output directory. For each component entry in a description file, a BeanInfo.java file is created. For each icon file, a 16 by 16 and 32 by 32 **gif** file is created. For the latter, the 16 by 16 image is expanded to a 32 by 32 size.

## Description of the component description file

```
{button Example,JI('VCAFE.HLP','Example_desc_file')}
```

The format of a description file (.desc) is documented in this topic.

Each description file line has the following basic syntax:

```
KEY={parameter}[, {parameter}[, {parameter} [...]]]
```

A line beginning with a semicolon (;) denotes a comment line (the remainder of the line is ignored), for example:

```
; this line is a comment
```

### Description Keys

The description file uses seven keys:

| Key         | Defines                                                 |
|-------------|---------------------------------------------------------|
| BASECLASS   | The base class that component "appears" to derive from. |
| CLASS       | The class being described.                              |
| SMALLICON   | The icon relating to this component.                    |
| TOOLBAR     | The toolbar tab for this component.                     |
| FOLDER      | The component library folder.                           |
| DEFPROPERTY | A default property for this class.                      |
| PROPERTY    | A property for this class.                              |
| AWTEVENT    | An AWT event for this class.                            |
| CONNECTION  | An interaction for this class.                          |
| WINHELP     | The Windows Help ID number.                             |

### Baseclass

The **BASECLASS** key defines the fully qualified class name of the base class used to define the default properties and interactions for the next class to be defined. This key is useful if you have a component that derives from `java.awt.Panel`, but you don't want to allow users to drop other components into the component.

Format:

```
BASECLASS={class name}
```

Examples:

```
BASECLASS=java.awt.Component  
BASECLASS=java.awt.Panel
```

### Class

The **CLASS** key defines the fully qualified class name of the component to be brought in. Each **CLASS** definition starts a new class/component description. Both component and abstract classes may be defined within the description file. If a description file contains multiple **CLASS** definitions, subsequent definitions describe classes and/or components that are derived from preceding classes.

Format:

```
CLASS={class name}
```

Examples:

```
CLASS=symantec.itools.awt.ImageButton  
CLASS=symantec.itools.awt.spinner.Spinner
```

### Smallicon

The **SMALLICON** key defines the "small" icon for the component Used throughout the product. The icon can either specify a DLL image containing the icon resource, or may specify an icon file that contains the icon. This key only appears once per class description, and should only be used if the class description defines a component class. The file path parameter is relative to the **BIN** subdirectory of the Visual Cafe installation directory.

Formats:

```
SMALLICON={icon file path}, "0"  
SMALLICON={DLL file path}, "{resource name | '#' resource id}"
```

Examples:

```
SMALLICON=components\ImageButton.ico,"0"  
SMALLICON=components\vpojava.dll,"ICON_FOO"  
SMALLICON=components\vpojava.dll,"#10"
```

### Toolbar

The `TOOLBAR` key defines the component toolbar tab name that contains this component. This key only appears once per class description, and should only be used if the class description defines a component class.

Format:

```
TOOLBAR={toolbar tab name}
```

Examples:

```
TOOLBAR=Multimedia  
TOOLBAR=Additional
```

### Folder

The `FOLDER` key defines the component library folder name that contains this component. This key only appears once per class description, and should only be used if the class description defines a component class.

Format:

```
FOLDER={folder name}
```

Examples:

```
FOLDER=Database  
FOLDER=Multimedia
```

### Property

The `PROPERTY` key defines a property for this class. This key may appear multiple times per class description, and may define properties for both abstract and component parent classes as well as base component classes.

Format:

```
PROPERTY={type},"{property description}","{property method}", "{default value}"
```

where:

{type} is the property type, which currently is one of the following:

|         |          |
|---------|----------|
| Boolean | Color    |
| Font    | Integer  |
| String  | String[] |
| URL     | URL[]    |

{property description} is the description that appears in the leftmost column in the Property List.

{property method} is the internal name is the internal base name of the property. For example, if the property method is "Color", then `getColor` is considered to be the internal method to get the property and `setColor` is the method to set the property.

{default value} is the default value of the property, which may be empty ("").

Examples:

```
PROPERTY=Integer, "Initial Value", "StartValue", "0"  
PROPERTY=URL[], "Image List", "Images", ""  
PROPERTY=Boolean, "Show Border", "ShowBorder", "false"
```

### Defproperty

The `DEFPROPERTY` key defines a "default" property for this class. This key may appear only once per component description, and may define properties for both abstract and component parent classes as well as base component classes. This key is

identical to the `PROPERTY` key with the difference that focus will be given to this property field in the Visual Cafe property inspector window when it first receives focus.

Format:

```
DEFPROPERTY={type},"{property description}","{property method}", "{default value}"
```

where:

{type} is the property type, which currently is one of the following:

```
Boolean      Color
Font          Integer
String        String[]
URL           URL[]
Enum
```

{property description} is the description that appears in the leftmost column of the property inspector

{property method} is the internal name is the internal base name of the property. For example, if the property method is "Color", then `getColor` is considered to be the internal method to get the property and `setColor` is the method to set the property.

{default value} is the default value of the property, which may be empty ("").

Examples:

```
DEFPROPERTY=Integer, "Initial Value", "StartValue", "0"
DEFPROPERTY=URL[], "Image List", "Images", ""
DEFPROPERTY=Boolean, "Show Border", "ShowBorder", "false"
DEFPROPERTY=Enum, "Direction", "Direction", "SW", "NE=0, NW=1, SE=2, SW=3"
```

### Awtevent

The `AWTEVENT` key defines an AWT event handling property for this class. This key may appear multiple times per class description, and may define properties for both abstract and component parent classes as well as base component classes.

Format:

```
AWTEVENT={event type}
```

where:

{event type} is the AWT event type, which currently is one of the following:

```
ACTION
FOCUS
KEYBOARD
MOUSE
WINDOW
```

Here is a list of the events covered by these event types:

| Event Type | Events                                                                          |
|------------|---------------------------------------------------------------------------------|
| AWTEVENT   | Java AWT event handled/processed                                                |
| ACTION     | ACTION_EVENT                                                                    |
| FOCUS      | GOT_FOCUS<br>LOST_FOCUS                                                         |
| KEYBOARD   | KEY_RELEASE<br>KEY_ACTION<br>KEY_ACTION_RELEASE<br>KEY_PRESS                    |
| MOUSE      | MOUSE_MOVE<br>MOUSE_UP<br>MOUSE_DOWN<br>MOUSE_DRAG<br>MOUSE_ENTER<br>MOUSE_EXIT |
| WINDOW     | WINDOW_MOVED<br>WINDOW_DESTROY                                                  |

WINDOW\_ICONIFY  
WINDOW\_DEICONIFY

**Connection**

The `CONNECTION` key defines an interaction, or connection, for this class. This key may appear multiple times per class description, and may define properties for both abstract and component parent classes as well as base component classes.

Format:

```
CONNECTION={form},"{type}","{init}","{expr}","{description}"
```

where:

`{form}` is either `input` or `output`. An `output` connection defines an interaction that returns data; an `input` connection defines an interaction that sets data, or initiates execution of a method that doesn't take data.

`{type}` is the Java type of the parameter or return value to the method tied to the interaction. Any Java type is valid. The most common types are `int`, `boolean`, `string`, and `void`.

`{init}` defines any initialization code that needs to be present prior to the code generated from the interaction expression (`{expr}`, see the next item). This string is usually blank.

`{expr}` defines the code generated that is used to create the connection. Properties and the following replacement variables are allowed in the code string:

|                      |                                                              |
|----------------------|--------------------------------------------------------------|
| <code>%name%</code>  | defines the name of the class/component                      |
| <code>%class%</code> | full classname of the class/component                        |
| <code>%arg%</code>   | method argument used for <code>output</code> connection data |

`{description}` is an English description of the connection. This string appears in the Interaction wizard when the connection is being created. The `{expr}` replacement variables above are allowed in the `{description}` as well. `%class%` is the only replacement variable allowed in `{description}`.

Examples:

```
CONNECTION=input,"boolean","", "%name%.show(%arg%);", "Show the %class% on condition"  
CONNECTION=output,"boolean","", "%name%.isEnabled()", "Is enabled?"
```

**Winhelp**

The `WINHELP` key defines the Windows help system ID number. The number can be decimal (345607) or hex (0x54607).

Format:

```
WINHELP=helpid[, helpfile]
```

where `helpfile` is the name of the file where the help resides. If not specified, "VCAFE" is assumed.

Examples:

```
WINHELP=0x54607
```

## Example .desc file

```
{button Concepts,AL('Description_File_overview',0,',')};
```

The following text is an example of the description file (.desc) for a combo box component in Visual Cafe.

```
; symantec.itools.awt.ComboBox component description
```

```
CLASS=symantec.itools.awt.ComboBox
```

```
SMALLICON=components\ComboBox.ico, "0"
```

```
ICONSUITE=Icons, "135"
```

```
FOLDER=Additional
```

```
TOOLBAR=Additional
```

```
PROPERTY=Boolean, "Editable", "Editable", "false"
```

```
PROPERTY=Boolean, "Searchable", "Searchable", "false"
```

```
PROPERTY=Boolean, "Case-sensitive", "CaseSensitive", "false"
```

```
PROPERTY=Font, "Font", "Font", ""
```

```
PROPERTY=Font, "Edit field font", "EditFieldFont", ""
```

```
PROPERTY=Font, "Drop-down list font", "DropDownFont", ""
```

```
AWTEVENT=ACTION
```

```
AWTEVENT=MOUSE
```

```
CONNECTION=input, "String", "", "%name%.addItem(%arg%);", "Add item to the list"
```

```
CONNECTION=output, "int", "", "%name%.countItems()", "Get the number of items in the list"
```

```
CONNECTION=input, "int", "", "%name%.enable(%arg%);", "Enable the item in the list"
```

```
CONNECTION=input, "int", "", "%name%.disable(%arg%);", "Disable the item in the list"
```

```
CONNECTION=input, "int", "", "%name%.delItem(%arg%);", "Delete the item from the list"
```

```
CONNECTION=input, "void", "", "%name%.delSelectedItem();", "Delete the selected item"
```

```
CONNECTION=output, "String", "", "%name%.getText()", "Get the text in the edit field"
```

```
CONNECTION=output, "String", "", "%name%.getSelectedItem()", "Get the text of the selected item"
```

```
CONNECTION=output, "int", "", "%name%.getSelectedIndex()", "Get the index of the selected item"
```

```
CONNECTION=input, "int", "", "%name%.select(%arg%);", "Select the item at the index"
```

```
CONNECTION=input, "int", "", "%name%.deselect(%arg%);", "Deselect the item at the index"
```

```
CONNECTION=input, "String", "", "%name%.select(%arg%);", "Select the item that matches the string"
```

```
CONNECTION=input, "boolean", "", "%name%.setEditable(%arg%);", "Set the editable mode"
```

```
CONNECTION=output, "boolean", "", "%name%.getEditable()", "Get the editable mode"
```

```
CONNECTION=input, "boolean", "", "%name%.setSearchable(%arg%);", "Set the searchable mode"
```

```
CONNECTION=output, "boolean", "", "%name%.getSearchable()", "Get the searchable mode"
```

```
CONNECTION=input, "boolean", "", "%name%.setCaseSensitive(%arg%);", "Set case-sensitivity"
```

```
CONNECTION=output, "boolean", "", "%name%.getCaseSensitive()", "Get case-sensitivity"
```



## Moving components in the Component Library

```
{button Concepts,AL('Object_Library_F1',0,','')} {button See Also,AL('Adding_Bean_to_Library_howto',0,','')}
```

You can drag [components](#) within the Component Library to another group or location.



## Deleting components from the Component Library

{button Concepts,AL('Object\_Library\_F1',0,','')} {button See Also,AL('Adding\_Bean\_to\_Library\_howto',0,','')}

As you are developing your project, you can delete user-created [components](#) from the Component Library. Deleting a component from the Library also removes the component from the Component Palette.

**Note** All JavaBeans components in a [JAR file](#) (as specified in the [manifest file](#)) are added to the Component Library. You cannot remove one component independently of the others in the JAR file.

1. In the Component Library, select the component to be deleted.
2. Choose Edit ► Cut, or press the DELETE key.



## Component Palette

## Understanding the Component Palette

```
{button How  
To,AL('Customizing_the_Palette_from_the_Palette_Tab_F1;Palette_F1;Forms_adding_objects;Connecting_Form_components_  
howto;Controlling_Position_and_Visibility_howto',0,'')} {button See  
Also,AL('Object_Library_F1;Form_Designer_F1;Creating_a_Project_howto',0,'')}
```

The [Component Palette](#) contains reusable [components](#). It is located at the top of the main Visual Cafe window or as a floating toolbar.

Visual Cafe provides an extensive collection of custom and third-party components that you can quickly add to your [forms](#) from the Component Palette. You can think of the Component Palette as another view of the [Component Library](#), but with easier access and more customization capabilities. The Component Library contains everything that the Component Palette contains, but the Component Library can contain more.

You can drag components from the Component Palette to the Form Designer or Project window to add them. You can also click a component on the Component Palette, then drag to draw it on the Form Designer.

You can customize the Component Palette to best meet your needs:

- add components to the Component Palette
- delete components from the Component Palette
- group components in tabs
- remove a tab from the Component Palette

You can add components to the Component Palette from these areas:

- Component Library
- Project window
- Customize Palette tab in the Environment Options dialog box

You can add any component from the Component Library to the Component Palette and easily use the component in your applets and applications. If you add a component to the Component Palette from the Project window, it is added to the Component Library as well.

Also on the Component Palette are these buttons:



The Interaction Tool lets you create an interaction between two components by visually connecting them. After you complete an interaction, the Selection Tool is selected and the Interaction Tool is not selected.



The Selection Tool is enabled by default. Click this icon to return to component select mode. A component is selected only if it is completely surrounded by the selection rectangle.

## Customizing the Component Palette

```
{button Concepts,AL('Adding_Objects_to_the_Palette_howto',0,'')} {button See  
Also,AL('Object_Library_F1;Connecting_Form_components_howto;Controlling_Position_and_Visibility_howto;Creating_a_Proje  
ct_howto;Forms_adding_objects;Customizing_the_Palette_from_the_Palette_Tab_F1',0,'')}
```

The Component Palette contains a variety of [components](#) that you can add to [forms](#). It can contain visual and invisible components, program modules, and form templates.

You can control the Component Palette's position and visibility by docking, floating, resizing, and hiding.

You can customize the Palette to contain the components that you use most often.

### To customize the Component Palette from the Component Palette tab

The Component Palette tab of the Environment Options dialog box provides an interface to help you quickly customize your Component Palette. To access it:

- Choose File ► Environment Options
- Component Palette tab.
- Right-click the Component Palette, then choose Customize Palette.
- [Details on using the Component Palette tab](#)

### To add components to the Component Palette from the Component Library

Use one of these methods:

- Drag the component from the Component Library and drop it on the tab of the Component Palette where you want the icon stored. Visual Cafe displays a message if the addition duplicates an existing component on the Component Palette. Duplicates are not allowed in the same tab.
- Select one or more components, then right-click and choose Add to Palette. This command is only available if the selected components are not currently on the Component Palette.
- Drag-and-drop a group from the Component Library to create a tab on the Component Palette. The tab contains all components in the group.

### To add components to the Component Palette from the Project window

While working in the Project window, you can quickly add components to your custom Palette:

1. Select the component.
2. Drag-and-drop the component onto the tab of the Component Palette where you want the component to be stored.

**Note** After you add a new component to a new tab, the group and component are added to the Component Library.

### To create a tab on the Component Palette

- Drag a new group from the Component Library onto the Component Palette. All items in the Library group are automatically added to the Component Palette tab.

### To move components within the same tab

- Drag-and-drop components within the same tab to reorganize their display.

### To delete a component from the Component Palette

1. Right-click a component on the Component Palette.
2. Select Remove Component.

### To delete a tab from the Component Palette

**Note** Deleting a tab deletes the group and all components within the tab. However, it does not delete them from the Component Library.

1. Right-click a tab on the Component Palette.
2. Select Remove Tab.

### To float the Component Palette

- Drag the toolbar from the top of the Visual Cafe window onto your desktop.
- Double-click somewhere in the toolbar background.

**To dock the Component Palette**

- Drag the toolbar to the top of the Visual Cafe window.
- Double-click somewhere in the toolbar background.

**To hide/show the Component Palette**

- Right-click at the top of the Visual Cafe window and select the toolbar name.
- Click the close box on the toolbar.

## Using the Component Palette tab

```
{button Concepts,AL('Adding_Objects_to_the_Palette_howto',0,'')} {button See  
Also,AL('Object_Library_F1;Palette_F1',0,'')}
```

The Component Palette tab allows you to add and remove components from the Component Palette, create new tabs in the Component Palette, and reorganize components within groups.

The Component Palette tab provides two panes for component display. The Available Components pane contains the same set of components as the Component Library. The Palette pane represents the current tabbed Palette toolbar.

Groups in the Palette pane represent tabs, and the components in each group display as icons on the tab.

### To access the Component Palette tab

- Choose File ► Environment Options
- Component Palette tab.
- Right-click the Component Palette, then choose Customize Palette.

### To add a component or tab to the Component Palette

- Select a component or group from the Component Library pane and drag it onto a Palette Group or into the general Palette area.

Dragging a component adds it to the current Palette group. Dropping the component onto another component adds the selected component to the same group.

Or

1. Select a Group in the Palette pane.
2. Select a component in the Component Library pane.
3. Click the Add button.

The selected component is added as a member of the current group.

### To move components within the same tab

- Drag-and-drop components within the same group to reorganize their display.
- Select a component and use the up and down arrow buttons to reorganize the display order.

### To move components to another tab

You can move components on the Component Palette to another group:

1. Select a component and drag the component to a new location.
2. Use the up and down arrow buttons to reposition the component.

### To delete a component or tab from the Component Palette

1. In the Palette list, select the component or group to delete.
2. Click Remove or press the DELETE key.

### To create a tab on the Component Palette

1. Click New Group.
2. Edit the group item name.

**Note** After you add a new component to a new tab, the group and component is added to the Component Library.

### To rename tabs

- Select the tab, then click the name again, and type a new name.

**Visual Cafe Components**

## Using Visual Cafe components

```
{button How  
To,AL('Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Palette_F1;Forms_adding_object  
s;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,','')} {button See  
Also,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers;How  
_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and_cont  
ainers',0,','')}
```

Visual Cafe provides an extensive collection of [components](#) to help you develop your Java programs faster. In the help, you can find step-by-step procedures for some components that show basic tasks. You can also find more detailed help in the components reference. See [Visual Cafe components and containers](#).

To get help on a component property, select the property in the Property List and press F1.

Remember that tasks common to many components are described in more general help topics.

## Using lightweight components

```
{button How  
To,AL('Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Palette_F1;Forms_adding_object  
s;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,','')} {button See  
Also,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers;How  
_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and_cont  
ainers',0,','')}
```

Most Visual Cafe components are heavyweight, meaning they own their own opaque native window. Other components are lightweight, meaning they extend directly from the Java Component or Container class or extend from another lightweight class.

When overlapping components, a heavyweight component is always on top of a lightweight component, no matter how you arrange it in the Form Designer or Project window. In the Project window, the order of the components is the order overlapping components are displayed, except when lightweight and heavyweight components overlap each other. So there are two lists: the order heavyweight components overlap and the order that lightweight components overlap.

The following Visual Cafe components are lightweight:

- ImageViewer
- InvisibleButton
- InvisibleHTMLLink
- Label3D
- RollOverButton
- SlideShow
- all shapes

Different Web browsers use a different “z-order” when determining how components overlap in an applet. The project window displays the order, and the browser can read it from top to bottom or from bottom to top. For example, if an InvisibleHTMLLink is on top of an image, you need to make sure it ends up on top for users to be able to click it. To ensure compatibility with different browsers, it is a good idea to “sandwich” the InvisibleHTMLLinks on top and beneath lightweight components they overlap. Use Layout ► Send to Back or Send to Front.



## Utility

## Using the Timer component

```
{button  
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers  
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and  
_containers',0,',')} {button See  
Also,AL('Timer_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Palette_F1;  
Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,',')}
```

The Timer [invisible component](#) lets you set a timer in your Java program. You can create an [interaction](#) between the Timer and other [components](#).

1. In the Component Palette, click Utility, then click Timer and drag it to the Form Designer.  
Alternatively, you can drag Timer from the Component Library.  
A new Timer appears on the [form](#) in the Form Designer.
2. Set properties in the Property List.  
You can enable and disable the Timer, cause it to cycle, and specify how long it takes before the Timer is activated.
3. Set an interaction to other components or write code to use the Timer.

## Using the Calendar component

```
{button  
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers  
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and  
_containers',0,',')} {button See  
Also,AL('Calendar_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Palette_  
F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,',')}
```

The Calendar [component](#) lets you add a calendar to your [form](#). Through an [interaction](#), you can set the date the calendar displays.

1. In the Component Palette, click Utility, then click Calendar and draw it on the Form Designer.  
Alternatively, you can drag Calendar from the Component Library or Palette.  
A new Calendar appears in the Form Designer.
2. Set properties in the Property List.  
You can set the day selection color and show or hide the component.

## Using the TreeView component

```
{button
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and
_containers',0,',')} {button See
Also,AL('TreeView_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Palette_
F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,',')} }
```

Use the TreeView [component](#) to create a hierarchical list of different text elements. The list can be expanded and contracted by users, similar to a directory structure of files. Follow these steps:

1. In the Component Palette, click Utility, then click TreeView and draw it on the Form Designer.  
Alternatively, you can drag TreeView from the Component Library or Palette.  
A new TreeView appears on the [form](#) in the Form Designer.
2. Resize the new TreeView component as needed.
3. In the Property List, click the Items property, then type your labels according to these guidelines:
  - Press CTRL+ENTER between labels, then ENTER when you are finished entering labels. (Each label should be on its own line.)
  - Add labels in order from top to bottom.
  - Create a hierarchy by adding spaces to the front of a label (spaces within a label are allowed). For example, no space is the root level, one space is the next level into the hierarchy, two spaces indicates one more level in, and so on. The label will be subordinate to the first label above it that is at a higher level in the hierarchy. For example:

```
level 1
 level 2
  level 3
level 1
 level 2
level 1
level 1
```

4. Look through the hierarchy in the Form Designer, then make adjustments to the Items property as needed.  
In the Form Designer, you can click a + to expand the hierarchy and a - to collapse it.

## Using the ProgressBar component

```
{button
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and
_containers',0,',')} {button See
Also,AL('ProgressBar_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Palet
te_F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,',')}
```

The ProgressBar component can display the status of a process, such as printing.

1. In the Component Palette, click Utility, then click ProgressBar and draw it on the Form Designer.  
Alternatively, you can drag ProgressBar from the Component Library or Palette.  
A new ProgressBar appears on the [form](#) in the Form Designer.
2. Set properties in the Property List.  
You can set several properties that affect the ProgressBar appearance, including the line style, color, bar type, initial bar value, and whether a percentage is displayed.
3. Set [interactions](#) or write code to make the ProgressBar show status.  
You can set interactions that display the ProgressBar status and change its appearance.

## Using the StatusScroller component

```
{button  
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers  
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and  
_containers',0,',')} {button See  
Also,AL('StatusScroller_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Pal  
ette_F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,',')}
```

The StatusScroller [invisible component](#) lets you set a scrolling message in the status bar of a browser where your applet is displayed. The scrolling area is as wide as the text. If you want to test the component in the Applet Viewer, resize the Applet Viewer window so it is longer on the bottom.

1. In the Component Palette, click Utility, then click StatusScroller and drag it to the Form Designer.  
Alternatively, you can drag StatusScroller from the Component Library.  
A new StatusScroller appears on the [form](#) in the Form Designer.
2. Set properties in the Property List.  
You can type the string, automatically start the StatusScroller, set the scroll direction, cause it to cycle, scroll clean (meaning the entire message scrolls before the message appears again), and set a delay.
3. Optionally set an [interaction](#) to other [components](#) or write code to use the StatusScroller.

## Multimedia

## Using the SlideShow component

```
{button
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and
_containers',0,',')} {button See
Also,AL('SlideShow_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Palette
_F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,',')} }
```

Use the SlideShow [component](#) to display a series of images.

### Note

- For deployment purposes, it is best to use a relative URL. That way you can move your Java program to another location and the graphics files can continue to display. A relative URL specifies the graphics file relative to the Java program. For example, if Applet1 is in a Project directory and the graphics files are in an Images subdirectory, specify just Images/file.
  - SlideShow is a lightweight component. If you want to overlap components, see [Using lightweight components](#) for important considerations.
1. In the Component Palette, click Multimedia, then click SlideShow and draw it on the Form Designer.  
Alternatively, you can drag SlideShow from the Component Library or Palette.  
A new SlideShow appears on the [form](#) in the Form Designer.
  2. In the Property List, click the URL List property, click the ... button, then specify the images in the dialog box. You can optionally add a description for an image.  
**Tip** If the files are named in a sequence, you can add the first file and a dialog box asks you if you want to add the other files in the sequence.
  3. Create [interactions](#) from external components, such as a Previous and a Next button, to the SlideShow to control the display of images.
  4. To display a description associated with an image, create an interaction from the SlideShow to a component that will display the text you entered in the URL dialog box.



## Using the Emblaze20 component

```
{button  
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers  
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and  
_containers',0,',')} {button See  
Also,AL('Emblaze_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Palette_  
F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,',')}
```

Use the Emblaze20 [component](#) to display an Emblaze animation.

**Note** For deployment purposes, it is best to use a relative URL. That way you can move your Java program to another location and the animation files can continue to display. A relative URL specifies the animation file relative to the Java program. For example, if Applet1 is in a Project directory and the animation files are in an Animation subdirectory, specify just Animation/*file*.

1. In the Component Palette, click Multimedia, then click Emblaze20 and draw it on the Form Designer.

Alternatively, you can drag Emblaze20 from the Component Library or Palette.

A new Emblaze20 appears on the [form](#) in the Form Designer.

2. In the Property List, click the URL property, click the ... button, then specify the animation file (**blz**).
3. Create an [interaction](#) or write code to start the animation.

For example, you could create an interaction from a Start button to the Emblaze20 component. You can also pause an animation.

## Using the ImageViewer component

```
{button  
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers  
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and  
_containers',0,',')} {button See  
Also,AL('ImageViewer_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Palet  
te_F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,',')}
```

Use the ImageViewer [component](#) to display a graphics file, such as **jpg** or **gif** files.

### Note

- For deployment purposes, it is best to use a relative URL. That way you can move your Java program to another location and the graphics files can continue to display. A relative URL specifies the graphics file relative to the Java program. For example, if Applet1 is in a Project directory and the graphics files are in an Images subdirectory, specify just Images/*file*.
  - ImageViewer is a lightweight component. If you want to overlap components, see [Using lightweight components](#) for important considerations.
1. In the Component Palette, click Multimedia, then click ImageViewer and draw it on the Form Designer.  
Alternatively, you can drag ImageViewer from the Component Library or Palette.  
A new ImageViewer appears on the [form](#) in the Form Designer.
  2. In the Property List, click the URL property, click the ... button, then specify the graphics file.

## Using the SoundPlayer component

```
{button  
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers  
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and  
_containers',0,',')} {button See  
Also,AL('SoundPlayer_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Palet  
te_F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,',')}
```

The SoundPlayer [invisible component](#) lets you play a Sun AU format sound file.

1. In the Component Palette, click Multimedia, then click SoundPlayer and drag it to the Form Designer.  
Alternatively, you can drag SoundPlayer from the Component Library.  
A new SoundPlayer appears on the [form](#) in the Form Designer.
2. In the Property List, click the URL List property, click the ... button, then specify the sound files in the dialog box.  
You can also set the other properties in the list as needed to specify where the files are played all at once and how many times the playing repeats.
3. Optionally set an [interaction](#) to other [components](#) or write code to use the SoundPlayer.

## Using the ScrollingText component

```
{button
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and
_containers',0,',')} {button See
Also,AL('ScrollingText_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Palet
te_F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,',')}
```

The ScrollingText [component](#) lets you set a scrolling message within a rectangular area. You can also specify a URL to link to.

1. In the Component Palette, click Multimedia, then click ScrollingText and drag it to the Form Designer.  
Alternatively, you can drag ScrollingText from the Component Library.  
A new ScrollingText appears on the [form](#) in the Form Designer.
2. Set properties in the Property List.  
You can type messages and URLs (press CTRL+ENTER between lines), set the scroll direction, set a delay, and the amount of pixels moved in each scroll step.

## Using the Plasma component

```
{button
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and
_containers',0,'')} {button See
Also,AL('Plasma_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Palette_F
1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,'')}
```

Use the Plasma [component](#) to display a rectangle containing moving colored shapes. If you do not want to view the shapes on the Form Designer, turn off the preview property.

1. In the Component Palette, click Multimedia, then click Plasma and draw it on the Form Designer.  
Alternatively, you can drag Plasma from the Component Library or Palette.  
A new Plasma appears on the [form](#) in the Form Designer.
2. Optionally set an [interaction](#) with other [components](#), such as a Start button.

## Using the Firework component

```
{button
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and
_containers',0,'')} {button See
Also,AL('Firework_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Palette_
F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,'')}
```

Use the Firework [component](#) to display a moving fireworks graphic.

1. In the Component Palette, click Multimedia, then click Firework and draw it on the Form Designer.  
Alternatively, you can drag Firework from the Component Library or Palette.  
A new Firework appears on the [form](#) in the Form Designer.
2. Optionally set an [interaction](#) with other [components](#), such as a Start button.

## Using the NervousText component

```
{button
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and
_containers',0,',')} {button See
Also,AL('NervousText_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Palet
te_F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,',')}
```

Use the NervousText [component](#) to display a moving text string.

1. In the Component Palette, click Multimedia, then click NervousText and draw it on the Form Designer.  
Alternatively, you can drag NervousText from the Component Library or Palette.  
A new NervousText appears on the [form](#) in the Form Designer.
2. In the Property List, type the text string in Text field.
3. Optionally set an [interaction](#) with other [components](#), such as a Start button.

## Using the Animator component

```
{button  
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers  
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and  
_containers',0,',')} {button See  
Also,AL('Animator_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Palette_  
F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,',')}
```

Use the Animator [component](#) to display a series of graphics files, such as **jpg** or **gif** files, to create an animation.

**Note** For deployment purposes, it is best to use a relative URL. That way you can move your Java program to another location and the graphics files can continue to display. A relative URL specifies the graphics file relative to the Java program. For example, if Applet1 is in a Project directory and the graphics files are in an Images subdirectory, specify just `Images/file`.

1. In the Component Palette, click Multimedia, then click Animator and draw it on the Form Designer.

Alternatively, you can drag Animator from the Component Library or Palette.

A new Animator appears on the [form](#) in the Form Designer.

2. In the Property List, click the URL List property, click the ... button, then specify the images in the dialog box.

**Tip** If the files are named in a sequence, you can add the first file and a dialog box asks you if you want to add the other files in the sequence.

3. Set other properties in the Property List.

You can have the animation run a certain number of times, have it run indefinitely, and preview it in the Form Designer.

4. Optionally create [interactions](#) from external components, such as a Start and a Stop button, to the Animator to control the animation display.



## Using the MovingAnimation component

```
{button
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and
_containers',0,','')} {button See
Also,AL('MovingAnimation_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;
Palette_F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,','')}
```

Use the MovingAnimation [component](#) to display a series of graphics files, such as **jpg** or **gif** files, to create an animation. Unlike the Animator component, the animation moves within the component boundaries by setting the shift offset property.

**Note** For deployment purposes, it is best to use a relative URL. That way you can move your Java program to another location and the graphics files can continue to display. A relative URL specifies the graphics file relative to the Java program. For example, if Applet1 is in a Project directory and the graphics files are in an Images subdirectory, specify just `Images/file`.

1. In the Component Palette, click Multimedia, then click MovingAnimation and draw it on the Form Designer.

Alternatively, you can drag MovingAnimation from the Component Library or Palette.

A new MovingAnimation appears on the [form](#) in the Form Designer.

2. In the Property List, click the URL List property, click the ... button, then specify the images in the dialog box.

**Tip** If the files are named in a sequence, you can add the first file and a dialog box asks you if you want to add the other files in the sequence.

3. Set other properties in the Property List.

You can have the animation run a certain number of times, have it run indefinitely, have a certain shift offset, and preview it in the Form Designer.

4. Optionally create [interactions](#) from external components, such as a Start and a Stop button, to the MovingAnimation to control the animation display.

**Additional**

## Using the InvisibleHTMLLink component

```
{button
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and
_containers',0,',')} {button See
Also,AL('InvisibleHTMLLink_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1
;Palette_F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,',')} }
```

An InvisibleHTMLLink [component](#) lets you set up a jump to a URL. Because it is invisible, InvisibleHTMLLink is ideal for creating a clickable area over an image that lets you jump to a new location in an HTML file.

1. In the Component Palette, click Additional, then click InvisibleHTMLLink and click and drag to draw a rectangle on the Form Designer.

Alternatively, you can drag InvisibleHTMLLink from the Component Library or Palette, and resize and reposition it.

A new InvisibleHTMLLink appears on the [form](#) in the Form Designer.

2. In the Property List, double-click the HTML Link URL property.
3. In the HTML Link URL dialog box, type the URL.

Anchors (#) are supported if you want to jump to a specific location within an HTML file.

### Important

- InvisibleHTMLLink is a lightweight component. If you want to overlap components, see [Using lightweight components](#) for important considerations.
- Different browsers handle anchors (#) differently. For example, while Netscape Navigator requires one # symbol, some versions of Internet Explorer require two (##). If you are using relative URLs, the Visual Cafe component will handle both cases for you; it is sufficient to type one #. However, if you are using absolute URLs, the Visual Cafe component cannot handle the difference for you.

## Using the MultiList component

```
{button  
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers  
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and  
_containers',0,',')} {button See  
Also,AL('MultiList_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Palette_F  
1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,',')} }
```

A MultiList [component](#) lets you create a table with rows and columns. Follow these steps:

1. In the Component Palette, click Additional, then click MultiList and draw it on the Form Designer.  
Alternatively, you can drag MultiList from the Component Library or Palette, then resize it.  
A new MultiList appears on the [form](#) in the Form Designer.
2. Resize the new MultiList component as needed.
3. In the Property List, click the Column Headings property, then type your column names. Press CTRL+ENTER between labels, then ENTER after the last label.
4. Click the List Items property, then type the list items according to these guidelines:
  - Press CTRL+ENTER between rows, then ENTER after the last row. (Each row should be on its own line.)
  - Type a semicolon (;) to indicate a new column in a row, for example, john; cheryl; tim would specify text for three columns in one row.
  - Add rows in order from top to bottom.
5. Optionally set the Heading and Cell properties to customize the look of your table.

## Panels

## Using the TabPanel container

```
{button
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and
_containers';0,','')} {button See
Also,AL('TabPanel_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Palette_
F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,','')}
```

A TabPanel component can contain multiple panel components. You can access a particular panel by clicking its tab, which can appear on the top or bottom of the TabPanel. To set up a TabPanel container, follow these steps:

1. In the Component Palette, click Panels, then click TabPanel and draw it on the Form Designer.  
Alternatively, you can drag TabPanel from the Component Library or Palette.  
A new TabPanel appears on the [form](#) in the Form Designer.
2. Resize the new TabPanel component as needed.
3. If the background color is white, you could set the Background property of TabPanel to a color, such as lightGray, to see the tabs better.
4. Drag panel components onto the TabPanel.  
A tab is automatically added for each panel, from right to left. You can change the tab order by changing the order of the panels listed in the Project window.  
Be sure to drag panels onto the TabPanel, and not a panel it contains. For example, you can drop a panel next to one of the tabs.  
**Tip** To make a tab the default active tab, enter its number in the TabPanel Active Tab property. The tabs are numbered starting from 0 at the left.
5. In the Property List, choose the TabPanel component from the menu, then click the Tab Labels property.
6. Type the tab labels. Press CTRL+ENTER between labels, then ENTER when you are finished entering labels.  
The labels are added in order. The top label is the rightmost label, and the bottom label is the leftmost label.
7. If you want the tabs to appear on the bottom rather than the top, set the Tabs On Bottom property to true.
8. To add components to a panel contained by a TabPanel, click a tab in the TabPanel, then drag components onto this panel.  
After clicking a tab, you can click the panel associated with that tab to better see its dimensions. All panels contained by TabPanel are the same size. You must resize the TabPanel to change the size of all the panels it contains.

## Using the ToolBarPanel and ToolBarSpacer components

```
{button
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and
_containers;Arranging_Objects_with_Layout_Managers',0,','')} {button See
Also,AL('ToolBarPanel_component;ToolBarSpacer_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer
_F1;Object_Library_F1;Palette_F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1;Arrangin
g_Components_on_a_Form_howto',0,','')}
```

A ToolBarPanel [container](#) can contain multiple [components](#), and is ideal for creating toolbars. Components are arranged in a FlowLayout. To add spaces between components on the panel, separate them with ToolBarSpacer components.

1. In the Component Palette, click Panels, then click ToolBarPanel and draw it on the Form Designer.  
Alternatively, you can drag ToolBarPanel from the Component Library or Palette, and resize the component as needed.  
A new ToolBarPanel appears on the [form](#) in the Form Designer.
2. Drag components onto the ToolBarPanel and arrange them in order.
3. Optionally drag ToolBarSpacer components onto the form to add space between the components.
4. Set other properties in the Property List, as needed.

You can change the appearance of the ToolBarPanel, including adding a title and changing title alignment, padding, border color, and the border style. You can also change the amount of space the ToolBarSpacers use.

## Using the KeyPressManagerPanel container

```
{button
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and
_containers;Arranging_Objects_with_Layout_Managers',0,','')} {button See
Also,AL('KeyPressManagerPanel_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Libra
ry_F1;Palette_F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1;Arranging_Components_o
n_a_Form_howto',0,','')}
```

You can allow users to tab between fields on a [form](#) by placing the fields in a KeyPressManagerPanel [container](#). The tab order of the [components](#) contained by the panel is listed in the Project window. To change the tab order, change the order of components in the Project window list.

To tab out of the panel to the next traversable component in the Java program, press CTRL+TAB.

1. In the Component Palette, click Panels, then click KeyPressManagerPanel and draw it on the Form Designer.  
Alternatively, you can drag KeyPressManagerPanel from the Component Library or Palette, and resize the component as needed.  
A new KeyPressManagerPanel appears in the Form Designer.
2. Drag components onto the KeyPressManagerPanel and arrange them.
3. Set other properties in the Property List, as needed.  
You can change the appearance of the KeyPressManagerPanel, including adding a title and changing title alignment, padding, border color, the border style, and the layout manager.



## Using the BorderPanel container

```
{button
Concepts,AL(^GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and
_containers;Arranging_Objects_with_Layout_Managers',0,'')} {button See
Also,AL(^BorderPanel_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Palet
te_F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1;Arranging_Components_on_a_Form_
howto',0,'')}
```

The BorderPanel [container](#) lets you organize [components](#) in a panel that has a border and can have a title.

1. In the Component Palette, click Panels, then click BorderPanel and draw it on the Form Designer.  
Alternatively, you can drag BorderPanel from the Component Library or Palette, and resize the component as needed.  
A new BorderPanel appears on the [form](#) in the Form Designer.

2. Drag components onto the BorderPanel and arrange them.

3. Set other properties in the Property List, as needed.

You can change the appearance of the BorderPanel, including adding a title and changing title alignment, padding, border color, border style, and the layout manager.

## Using the ScrollingPanel container

```
{button  
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers  
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and  
_containers',0,',')} {button See  
Also,AL('ScrollingPanel_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Pal  
ette_F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,',')}
```

A ScrollingPanel [container](#) has scroll bars and can contain one [component](#) or panel, which can contain multiple components.

1. In the Component Palette, click Panels, then click ScrollingPanel and draw it on the Form Designer.  
Alternatively, you can drag ScrollingPanel from the Component Library or Palette, then resize it as needed.  
A new ScrollingPanel appears on the [form](#) in the Form Designer.
2. Design another panel, if you want multiple components in the ScrollingPanel.
3. Drag a component or the other panel onto the ScrollingPanel.  
The panel now appears within the scrolling region. You can test it in the Applet Viewer.
4. Set other properties in the Property List, as needed.  
You can change the display of the scroll bars and set a minimum size.

## Using the RadioButtonGroupPanel container

```
{button
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and
_containers',0,',')} {button See
Also,AL('RadioButtonGroupPanel_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Libra
ry_F1;Palette_F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,',')}}}
```

Use the RadioButtonGroupPanel [container](#) to contain RadioButton [components](#), which act as a group within the panel – only one radio button can be selected at a time.

1. In the Component Palette, click Panels, then click RadioButtonGroupPanel and draw it on the Form Designer.  
Alternatively, you can drag RadioButtonGroupPanel from the Component Library or Palette, then resize it as needed.  
A new RadioButtonGroupPanel appears on the [form](#) in the Form Designer.
2. Drag RadioButton components onto the panel.
3. In the Property List, set the properties of each RadioButton, including the label. Set one of the RadioButton's states to true; this is the default selection.

## Using the ImagePanel container

```
{button  
Concepts,AL('GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers  
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and  
_containers',0,'')} {button See  
Also,AL('ImagePanel_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Palett  
e_F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,'')}
```

Use the ImagePanel [container](#) to display a graphics file, such as a **jpg** or **gif** file. You can drop other [components](#) on top of the image. You can choose different image display options, such as tiled, centered, or scaled.

**Note** For deployment purposes, it is best to use a relative URL. That way you can move your Java program to another location and the graphics files can continue to display. A relative URL specifies the graphics file relative to the Java program. For example, if Applet1 is in a Project directory and the graphics files are in an Images subdirectory, specify just `Images/file`.

1. In the Component Palette, click Panels, then click ImagePanel and draw it on the Form Designer.  
Alternatively, you can drag ImagePanel from the Component Library or Palette, then resize it as needed.  
A new ImagePanel appears on the [form](#) in the Form Designer.
2. In the Property List, click the URL property, click the ... button, then specify the graphics file.
3. In the Property List, specify the image style.

## Using the SplitterPanel container

```
{button  
Concepts,AL(`GUI_development_with_Visual_Caf;Working_with_Basic_User_Interface_Components;Understanding_Containers  
;How_is_my_Work_Kept_In_Sync_overview;Understanding_Component_Connections_overview;Visual_Cafe_components_and  
_containers',0,','')} {button See  
Also,AL(`SplitterPanel_component;Designing_and_Building_GUIs_with_Visual_Caf;Form_Designer_F1;Object_Library_F1;Palet  
te_F1;Forms_adding_objects;Creating_a_Form_howto;Using_the_Interaction_Wizard_F1',0,',')}
```

A SplitterPanel [container](#) can be divided into subpanels, which hold visual [components](#) and other panels. You must set up subpanels programmatically. See [SplitterPanel component](#) for more information. You can drop components into subpanels from the Component Library or Palette. Subpanels can be resized at run time with the mouse.

## Obsolete Custom Components Topics

## Understanding custom component integration

```
{button How To,AL('Library_adding_objects_howto',0,'')} {button See  
Also,AL('Description_File_overview;Example_desc_file',0,'')}
```

<<Needs to be updated.>>

Creating and integrating custom components into Visual Cafe is relatively straightforward. Any Java component can be used in a Visual Cafe program by referencing the component class in the Java source code. If you want to use the custom component in Visual Cafe views, such as the Component Library, Form Designer, and Class Browser, you must integrate the component into Visual Cafe.

An integrated custom component is made up of two main pieces: the component's class or classes and the component's description file.

Visual Cafe components are basic Java classes that usually derive from `java.awt.Canvas` or `java.awt.Panel`. Component properties are exposed using the Sun Java Beans method property definitions. Panel components can contain other components (including other Panel components), whereas Canvas components cannot.

Component descriptions are files that describe the interface of components to Visual Cafe. They include definitions of properties, component interactions, event handling, and component inheritance.

If you have modified a Visual Cafe component and want to place it in the Component Library so you can reuse it, all you have to do is drag the component from the Project window, Objects view, into the Component Library.

## ▶ Adding custom components to the Component Library

```
{button Concepts,AL('Object_Library_F1;Example_desc_file',0,','')} {button See  
Also,AL('Adding_Files_to_a_Project_howto;Deleting_Objects_from_the_Object_Library_howto',0,','')}
```

<<Needs to be updated.>>

If you have modified a Visual Cafe component and want to place it in the Component Library, all you have to do is drag the component from the Project window, Objects view, into the Component Library. However, if you want to add custom components that are not based on the Visual Cafe components, you need to follow these steps.

**Note** You only need to add components to the Component Library if you want to visually select and use the custom component with Visual Cafe views. Custom components can be referenced in the program's Java code without being integrated into Visual Cafe.

1. Create the component class Java file (**.class**).
2. Create a description file for the component (**.desc**).

### ▶ Details on the description file

3. Create a small icon for the component (**.ico**).

Create a 32 by 32 standard Windows icon, but only the 16 by 16 upper left region of the icon will be used and displayed by Visual Cafe.

4. Add the icon and description files to your Visual Cafe environment.

The description file and component icon must be copied to the Visual Cafe **bin\component** directory.

5. Make sure the class file is in the location you want to store it.

This location must be in your class path. Remember that class files are case-sensitive. If you want to add the class file to a package, the class file must be in the package directory.

6. Display the Component Library by choosing View (or Window) ▶ Component Library.
7. Choose Insert ▶ Component into Library.

An Open dialog box displays.

8. Select the class file, then click Open.

An Add to Library dialog box displays.

9. Select a group, then click OK.

The component is added to the Component Library. You can verify that it is there.





## Adding Palette objects from the Custom Palette dialog box

```
{button Concepts,AL('Palette_F1',0,'')} {button See  
Also,AL('Adding_Palette_Objects_from_ProjWindow_howto;Adding_Palette_Objects_with_Insert_howto',0,'')}
```

The Custom Palette dialog box provides an interface to help you quickly customize your Palette. Access the dialog box by choosing:

- File ► Environment Options
- Component Palette tab
- Customize Palette from the Component Palette's pop-up menu

1. Select an object or group from the Component Library pane and drag it onto a Palette Group or into the general Palette area.

Dragging an object adds it to the current Palette group. Dropping the object onto another object adds the selected object as a sibling of the same group.

### Or

1. Select a Group in the Palette pane.
2. Select an object in the Component Library pane.
3. Click the Add button.

The selected object is added as a member of the current group.

## Adding Palette objects from the Component Library

```
{button Concepts,AL('Palette_F1',0,'')} {button See  
Also,AL('Customizing_the_Palette_from_the_Palette_Tab_F1;Adding_Palette_Objects_from_ProjWindow_howto;Adding_Palett  
e_Objects_from_the_Palette_howto;Adding_Palette_Objects_with_Insert_howto',0,'')}
```

To add objects to the Palette from the Component Library, use one of these methods:

- drag the object from the Component Library and drop it on the tab of the Palette that you want the icon stored. Visual Cafe displays a message if the addition duplicates an existing object on the Palette. Duplicates are not allowed in the same tab.
- select the objects and use the right mouse pop-up menu command Add to Palette. This command is only available if the selected objects are not currently on the active tab of Palette's tab.

**Note** Dragging and dropping a group from the Component Library creates a tab on the Palette. The tab contains all components in the group.



## Adding Palette objects from the Project Window

```
{button Concepts,AL('Palette_F1',0,'')} {button See  
Also,AL('Customizing_the_Palette_from_the_Palette_Tab_F1;Adding_Palette_Objects_from_ProjWindow_howto;Adding_Palett  
e_Objects_from_the_Library_howto;Adding_Palette_Objects_with_Insert_howto',0,'')}
```

While working in the Project window, you can quickly add objects to your custom Palette:

1. Select the object.
2. Drag/drop the object onto the tab of the Palette where you want the object to be stored.



## Creating a Component Palette tab

```
{button See Also,AL(' Adding_Objects_to_the_Palette_howto',0,'')}
```

Add tabs to your custom Palette to help organize components.

1. Choose File ▶ Environment Options

▶ Palette tab.

2. Click New Group.
3. Edit the group item name.

A tab is also created when you drag a new group from the Component Library onto the Palette. All items in the Library group are automatically added to the Palette tab.



## Deleting objects from the Component Palette

{button See Also,AL('Adding\_Objects\_to\_the\_Palette\_howto;Library\_adding\_objects\_howto;Forms\_adding\_objects',0,','')}

As you customize your Palette, you may need to remove objects that you no longer need on a frequent basis.

**Caution** Deleting a tab deletes the group and all objects within the tab.

### From the Palette

1. Right-mouse click an object on the Palette.
2. Select Remove Component.

### From the Environment Options dialog box

1. Choose File ► Environment Options
- Palette tab.
2. Select the object to delete.
  3. Click Remove or press the DELETE key.



## Moving Palette objects

{button Concepts,AL('Palette\_F1',0,'')} {button See Also,AL('Adding\_Objects\_to\_the\_Palette\_howto',0,'')}

Palette components can be moved within their group or to another group.

1. Choose File ▶ Environment Options
- ▶ Component Palette tab.
2. Select a Palette object and drag the object to a new location.
3. Use the up and down arrow buttons to reposition the object.

Within the Palette toolbar, you can drag and drop components within the same tab to reorganize their display.



## Building a custom Component Palette

```
{button How To,AL('Adding_Objects_to_the_Palette_howto;Deleting_Objects_form_the_Palette_howto',0,'','')}
```

Visual Cafe provides a extensive collection of custom and third-party objects that you can quickly add to your forms, including grids and tabbed dialog boxes.

Palette customization includes:

- creating object groups
- adding objects to the Palette
- deleting objects from the Palette
- removing a tab from the Palette

You can add and remove objects on the Palette from the Environment Options dialog box Component Palette tab.

When groups are added to the Palette, they display on the Palette as tabs. Palette tabs can display horizontally only.



## Removing files from a JAR

```
{button Concepts,AL(^Using_JAR_files_overview;Object_Library_F1;Projects_overview',0','')} {button See  
Also,AL(^Add_to_Library_dialog_F1;Adding_Files_to_a_Project_howto;Adding_objects_to_project_howto;Creating_a_Project_ho  
wto;Forms_adding_objects;Customizing_the_Palette_howto;Adding_Bean_to_Library_howto',0','')}
```

Visual Cafe provides the JAR Packager, a tool you can use within its environment to quickly create [JAR files](#). While creating a JAR, Remove Files allows you to remove files that you do not want to include from the JAR.

### To remove files from a JAR

1. Select the file you want to remove.

**Note** You can select multiple files by pressing Shift while clicking the files.

2. Click Exclude Files.



# Debugging

## Understanding the Visual Cafe debugger

```
{button How To,AL('conditional_breakpoint_dialog_f1;toggling a breakpoint;setting a conditional breakpoint;enabling or disabling a breakpoint;setting a breakpoint on a line number',0,'')} {button See Also,AL('Debugging_applets_and_Applications;Understanding_Workspaces;Working_with_Exceptions_in_Java_and_Visual_Caf',0,'')}
```

After you write and execute your program, you might encounter errors, such as compile errors (code construction, syntax errors), run-time errors that occur after you start the program (dividing by zero or writing to a file that does not exist), or logic errors (the program does not do what you want it to do.)

One of the most powerful tools in the Visual Cafe environment is the integrated debugger. The debugger lets you watch your program execute line-by-line. Using the debugger, you can monitor:

- the values stored in variables
- which methods are being called
- the order that program [events](#) occur

**Note** Your program must successfully compile into a [class](#) file before the debugger can open it.

When you run the debugger by choosing Project ► Run in Debugger, Visual Cafe switches to [debug mode](#). Unless you have Visual Cafe Professional edition, while you are in debug mode, you cannot compile your source files or rebuild your project. To try out your code changes, you must first stop the debugger and recompile your program. Once the program has recompiled, you can restart the debugger. For more information on run-time editing with the Professional edition, see [Incremental debugging features](#). With run-time editing, when you find run-time errors you can modify the source files to correct the behavior of your program.

While debugging your program, you can use the [Source window](#), [Class Browser](#), [Breakpoints window](#), [Variables window](#), [Calls window](#), [Threads window](#), and [Messages window](#) to help you isolate problems and resolve them. The Source window, Class Browser, Messages window, and Breakpoints window are available at all times; the other windows show information while you are debugging.

## Debugging applets and applications

```
{button How To,AL('stopping a program;pausing a program;running your program;correcting your source code;starting remote  
applet application debugging;ending remote applet application debugging;stepping into a method;Browser_debug_howto',0,',';')}  
{button See  
Also,AL('Debugging_applets_and_Applications;Understanding_the_Visual_Caf_Debugger;Understanding_Workspaces;Working  
_with_Exceptions_in_Java_and_Visual_Caf',0,',';')}
```

When you **debug** a program, you can execute the instructions in the program line-by-line and watch the result. This allows you to pinpoint the exact source of a problem in a misbehaving program.

There are three basic techniques that can be used to step through method calls in your program code: stepping into, stepping over, and stepping out. Each technique has an associated icon in the Debug toolbar.

### Step Into

When you step into your code, the debugger executes one line of code including any jumps to other methods until it reaches the next line of code. This method allows you to step through the program, executing every statement completely.

When you step into a method call, the debugger jumps to the code for that method, and steps through it as well. If the code for the method is in a different file, the debugger opens that file, and jumps right to the code for the **method**.

Stepping into every line of code, for every method called by your program is not usually the best way to debug a program. For example, let's say your program calls the `println` method. We know the `println` method works, because it is part of the Java language. Stepping into method calls like `println` throughout a program can quickly result in a chaos of open windows. A more useful approach to debugging, is to step into some parts of the code and to step over other parts. You can avoid stepping through known working code by stepping over method calls. However, if you stepped in where you should have stepped over, you could step out.

### Step Over

Step Over executes one line of code. However, if the current statement is a call to a method, the debugger executes the method behind the scenes and returns to the next statement following the method call.

By using the Step Over method, you can bypass unnecessarily opening other files, and stepping into every line of code each time a method is called.

### Step Out

Step out returns to the calling method at the point after the current method was called.

### Editing Breakpoints

Watching an entire program execute from beginning to end helps you understand the program flow. However, it is more likely that there are only specific parts of the program which you want to observe. It makes sense to step through the few specific lines of code which have behavior you want to observe rather than the entire program. In these cases you can use breakpoints. A breakpoint is a flag placed in the source code that tells the debugger to pause execution of the program.

When you work with breakpoints the debugger executes all the statements in the program until it encounters a breakpoint. The program pauses at the breakpoint so you can check the state of the program at that point, including checking the value of variables. As you debug your code, you can use as many breakpoints as you want.

To set breakpoints in your program, position your cursor on the line where you want to pause execution and click the Set Breakpoint icon in the Debug Toolbar.

## Working with exceptions in Java and Visual Cafe

```
{button How To,AL('stopping a program;pausing a program;running your program;correcting your source code;starting remote applet application debugging;ending remote applet application debugging;stepping into a method',0,';')} {button See Also,AL('debugging_applets_and_applications;understanding_the_visual_cafe_debugger;Understanding_the_Visual_Caf_Debugger',0,';')}
```

The Java language uses exceptions to process errors in its programs. An exception is an [event](#) that occurs during the execution of your program that interferes with, disrupts, or stops the normal flow of instructions.

### Throwing exceptions

Some types of errors force the Java run-time system to throw exceptions — from simple programming errors to invalid data. When such an error occurs within a Java [method](#), the method creates an exception [component](#) and passes it to the Java run-time system by throwing it. This exception component contains important information about the exception, including its type and the state of the program when the error occurred. The run-time system tries to find a piece of code to handle the error. This process of creating an exception component and passing it to the Java run time system is called *throwing an exception*.

### Catching exceptions

After a method throws an exception, the Java run-time system finds a way to handle the exception. One place to handle exceptions is the set of methods in the [call stack](#) of the method where the error occurred. The Java run-time system scans backwards through the call stack, starting in the method where the error occurred, until it locates a method that has a suitable exception handler. An exception handler is suitable if the type of the exception thrown is the same as the type of exception handled by the exception handler. The exception moves up through the call stack until a suitable handler is found and one of the calling methods handles the exception. This is called *catching the exception*. If the run-time system searches all of the methods on the call stack without encountering a suitable exception handler, the run-time system as well as the Java program terminate.

### Setting exceptions in Visual Cafe

You can view and set the exceptions options by choosing Project ► Options

► Debug tab and choosing Exceptions from the drop-down list. To stop whenever a particular exception occurs, check the box to the left of the exception name. When this option is set, the program stops whenever the exception is encountered regardless of whether your program handles the error or not. The default behavior for exceptions is for the debugger only to stop if a particular exception is not handled in the source code. For more information on setting exception options, see [Defining how exceptions are handled by the debugger](#).

## Incremental debugging features

```
{button How To,AL('Correcting your Source Code;Debugging Threads;Viewing and Modifying Variables;F1_Call_Stack_Window;Watching Variables and Expressions;Managing Breakpoints',0,'')} {button See Also,AL('Understanding_the_Visual_Caf_Debugger;The_Debugging_Workspace_and_Tools;Debugging_Applets_and_Applications;Debugging Remotely;Handing Control to your Program',0,'')}
```

If you have the Professional edition of Visual Cafe, you can use several [incremental debugging](#) features that make debugging your Java programs more efficient. While your program is executing or paused in the Visual Cafe debugger, you can edit your Java program and immediately see the effects of the code change. This is also called *run-time editing*. The code is compiled and saved automatically.

You enable run-time editing in the Debugging tab of the Environment Options dialog box. See [Setting debugging options for the environment](#) for more information.

Debug ► Update Now forces an incremental update and saves all files.

Debug ► Restart Method is like a “Pop” command. It takes you back to the method that called the currently active method and allows you to rerun the current method from the beginning. You should not think of it like an undo command, because it does not undo side effects of code that was run.

Another incremental debugging feature is if you change a portion of code that is active (anywhere on the call stack), the code is compiled and saved, and you get a dialog box asking what action you want to take:

- Restart the program — Start the program in the debugger again.
- Restart the active method — Start the active method again. (This option is valid only if you perform run-time editing while your program is paused.)
- Continue — Continue with the old code until the next time the code becomes active. Ignore breakpoints in this code until the code becomes active again.
- Stop debugging — Exit the debugger.

The recommended action is already selected for you in the dialog box.

**Note** When debugging native code, you can add new methods, while with bytecode you cannot.

## Native debugging features

```
{button How To,AL('Correcting your Source Code;Debugging Threads;Viewing and Modifying  
Variables;F1_Call_Stack_Window;Watching Variables and Expressions;Managing Breakpoints;DLL_debug_program',0,';')}  
{button See  
Also,AL('Understanding_the_Visual_Caf_Debugger;The_Debugging_Workspace_and_Tools;Debugging_Applets_and_Applicati  
ons;Debugging Remotely;Handing Control to your Program',0,';')}
```

If you have the Professional edition, you can debug native Win32 applications and DLLs in Visual Cafe the same as you would bytecode programs. For DLLs, you need to specify the calling program you want to use to run and debug your DLL. See [Specifying a program for running and debugging a DLL](#) for more information.

Note the following differences between debugging native and bytecode programs:

- The Calls and Threads windows are different for native and bytecode programs.
- When debugging native code while [incremental debugging](#) is enabled, you can add new methods, while with bytecode you cannot.
- You cannot perform remote debugging.

## Running in Debugger



## Debugging your program

```
{button How To,AL('Correcting your Source Code;Debugging Threads;Viewing and Modifying  
Variables;F1_Call_Stack_Window;Watching Variables and Expressions;Managing Breakpoints',0,'')} {button See  
Also,AL('Understanding_the_Visual_Caf_Debugger;The_Debugging_Workspace_and_Tools;Debugging_Applets_and_Applicati  
ons;Debugging Remotely;Handing Control to your Program',0,'')}
```

Debugging involves finding and fixing bugs in your code. After building your [project](#) you can enter debugging mode by choosing Project ► Run in the Debugger.

The Debug [workspace](#) is automatically loaded. By default, the Debug workspace includes the [Calls](#), [Variables](#), and [Breakpoints](#) windows, which are opened automatically in the same size and position as they were when the project was last run. In addition, the debugger also has [Watch](#) and [Threads](#) windows.

These windows help you isolate and resolve problems. The [Source window](#) and [Class Browser](#) are also available during development and debugging.

The Visual Cafe debugger:

- provides a Windows graphical user interface
- provides a graphical representation of data structures
- supports breakpoints
- lets you drag-and-drop to execute commands





## Handing control to your program

```
{button How To,AL('Running to the Cursor Location;Running to First Line;Running to Program End;Running your Program',0,'')} {button See Also,AL('Defining_exceptions_debugger;Pausing a Program;Restarting a Program;Resuming a Program;Stopping a Program',0,'')}
```

When you run your program in the debugger, you hand control over to it and interact with it as a user, but you can still debug it. When you run your program outside the debugger, you are executing your program as a finished program and you cannot break into debug mode.

In Visual Cafe, you can choose to run your program in one of four ways. You can run your program:

- until it terminates normally or reaches a breakpoint or an exception.
- until execution reaches the cursor location in the Source window.
- so it pauses as it is about to execute the first line.
- from its current debug point until it terminates, ignoring any breakpoints that are set.



## Running your program in the debugger

```
{button Concepts,AL('Handing_Control_to_your_Program',0,'')} {button See Also,AL('Running to the Cursor  
Location;Running to First Line;Running to Program End',0,'')}
```

After creating your program, you will want to run your program until it terminates normally or encounters a breakpoint.

- Choose Project ► Run in Debugger

### Note

- Before running in the debugger, make sure your project options are set to debug. See [Specifying whether builds are debug or final](#) for more information.
- You can run your program outside of the debugger by choosing Project ► Execute.



## Running to the first line

```
{button Concepts,KL('Handing Control to your Program',0,'')} {button See Also,AL('Running to the Cursor Location;Running to Program End;Running your Program',0,'')}
```

Visual Cafe lets you run your program and pause just before the first line executes. This puts you in [debug mode](#) before anything has been done to your program's state.

- Choose Project ► Step Into.

This loads your Java program into the debugger and prepares to execute the first line. At this point, you can examine the state of your program before it begins to execute.



## Running to the program end

{button Concepts,AL('Handing\_Control\_to\_your\_Program',0,'')} {button See Also,AL('Running to the Cursor Location;Running to First Line;Running your Program',0,'')}

You can run your program from its current point until the end, ignoring any breakpoints that are set. This allows you to check for any suspected [exception](#) conditions.

- Choose Debug ► Continue to End.

Your Java program will continue to run until it exits normally or you cause it to exit by closing it as you would outside of the debugger.

**Note** If any kind of exception occurs, the program will break at the point of the violation, unless otherwise specified. For more information on setting exception options, see [Defining how exceptions are handled by the debugger](#).



## Running to the cursor location

{button Concepts,AL('Handing\_Control\_to\_your\_Program',0,'')} {button See Also,AL('Running to First Line;Running to Program End;Running your Program',0,'')}

You can run your program until execution reaches the cursor location, after which the program pauses. This is a useful way to continue from a breakpoint to a line you are inspecting in the Source window.

- Choose Debug ► Continue to Cursor.

**Note** If the selected line does not get executed before the end of the program, your program will not pause.



## Pausing a program in the debugger

```
{button See Also,AL('Stopping a Program;Resuming a Program',0,'')}}
```

In Visual Cafe, you can pause an executing program and switch to [debug mode](#). The effect on your program is the same as if a breakpoint is hit.

- Choose Debug ▶ Pause.

**Note** When an unhandled [exception](#) is encountered, the program pauses automatically at the line where the error occurred.

Often when you choose to pause your Java program, it is executing in a portion of code inside the Java AWT. If so, you are prompted to find that source file.

While your program is paused, you can examine its state by using the [Calls](#) and [Variables](#) windows, as well as setting breakpoints.



## Resuming a program in the debugger

{button See Also,AL('Restarting a Program;Stopping a Program;Pausing a Program',0,'')}  
{button See Also,AL('Restarting a Program;Stopping a Program;Pausing a Program',0,'')}

You can resume execution when your program is paused because of a breakpoint, an exception, or because you manually paused execution. When you resume your program, execution is continued from the current location.

- Choose Debug ▶ Continue.



## Restarting a program in the debugger

{button See Also,AL('Resuming a Program;Stopping a Program',0,'')}}

Restarting a program is when you start execution over again from the beginning. This is different from continuing a program where you restart execution after a breakpoint.

- Select Debug ▶ Restart.

When Restart is selected while a program is executing, it is the same as choosing Debug ▶ Stop then Project

- ▶ Run in Debugger. Otherwise, it is the same as choosing Debug
- ▶ Stop then Project
- ▶ Step Into.





## Stopping a debug session

{button See Also,AL('Restarting a Program;Resuming a Program;Running your Program',0,';')}  
}

You can completely stop a program (as opposed to pausing it temporarily). Stopping a program terminates it completely you can work further on it. Execution of a stopped program cannot be continued. For information on run-time editing with the Professional edition, see [Incremental debugging features](#).

- Choose Debug ▶ Stop.

The Java program also is terminated.

## Debugger Windows



## Using the Messages window

```
{button Concepts,AL('Adding_a_Dialog_howto;Debugging Your Program',0,'')} {button  
Concepts,AL('Understanding_Error_Messages_in_Java_and_Visual_Caf',0,'')}
```

This window displays all Visual Cafe messages. For example, if an error is encountered during parsing, the error displays in this window.

Anything you write to `System.out` can also appear in the Messages window when you are running the in the debugger. For example:

```
System.out.println("my message");
```

Double-click any error message to open the file in the [Source window](#) with focus on the selected error.

### To open the Messages window

- Choose View (or Window) ▶ Messages.



## Using the Variables window

```
{button Concepts,AL('Adding_a_Dialog_howto;Debugging Your Program',0,'')}}
```

This window shows the variables that are active in the current context. You can modify these variables directly in this window.

For each variable, the window can display the variable name, type, and value.

### To open the Variables window

- Choose View (or Window) ▶ Variables.

### Tasks

[Viewing and modifying variables](#)

[Watching variables and expressions](#)

[Modifying a variable in the Variables window](#)

[Viewing the value of a variable](#)

[Viewing type information for a variable](#)



## Using the Calls window

```
{button Concepts,AL('Adding_a_Dialog_howto;Debugging Your Program',0,'')}}
```

This window shows all the method calls that have started, but not completed execution.

When debugging in Visual Cafe, you can view the stack of methods in your application that have started but not completed. These pending methods are displayed in the Calls window. The currently executing method appears at the top of the stack and older function calls below that. You can also see the parameter types and values for each method on the call stack.

The active method is indicated by a black arrow next to it. By double-clicking an entry in the Calls window, you can change the context of the Variables window to display the variables for that method, and its source.

### To open the Calls window

- Choose View (or Window) ► Call Stack.

### Tasks

[Viewing Parameters for a Method on the Call Stack](#)

[Viewing Source for a Method on the Call Stack](#)

[Viewing the Call Stack for a Thread](#)

[Viewing Variables for a Method on the Call Stack](#)



## Using the Breakpoints window

```
{button Concepts,AL('Adding_a_Dialog_howto;Debugging Your Program',0,','')}
```

The Breakpoints window displays a list of all breakpoints you've defined in a project. Use this window to add, remove, or modify breakpoints.

The location and condition of each breakpoint is displayed.

### To open the Breakpoints window

- Choose View (or Window) ► Breakpoints.

### Tasks

[Setting a Breakpoint](#)

[Clearing a Breakpoint](#)

[Enabling or Disabling a Breakpoint](#)

[Ignoring Breakpoints](#)

[Managing Breakpoints](#)

[Modifying a Conditional Breakpoint](#)

[Setting a Breakpoint on a Line Number](#)

[Setting a Breakpoint on a Method Name](#)

[Setting a Conditional Breakpoint](#)

[Stepping Through Code When the Program is Paused](#)

[Toggling a Breakpoint](#)

[Viewing Source for a Breakpoint](#)



## Using the Watch window

```
{button Concepts,AL('Adding_a_Dialog_howto;Debugging Your Program',0,',')}}
```

In Visual Cafe, you can specify variables and expressions that you want to watch while debugging your program. The variables that you elect to watch are displayed in the Watch window. Variables in the Watch window are only updated when you pause a running program.

You can also modify the value of a variable using the Watch window.

**Caution** Since the program is paused, do not enter a watch expressions that rely on calls to other components.

### To open the Watch window

- Choose View (or Window) ▶ Watch.

### Tasks

[Deleting a variable or expression from the Watch window](#)

[Modifying a variable or expression in the Watch window](#)

## Using the Threads window

```
{button Concepts,AL(' Adding_a_Dialog_howto;Debugging Your Program',0,',','')}
```

The Threads window presents at a glance all the currently existent [threads](#) that your program has created, together with their states. The Thread window provides no benefits when debugging a single-thread application. It is only when debugging a multi-threaded application that the Thread window provides indispensable services. This window lets you:

- easily switch between threads to debug
- update the Source window with a thread's current location
- update the Call window with a thread's call chain

The current threads are listed one per row. The currently selected thread is highlighted. You can change the selection by clicking a different row, or by using the arrow keys. The primary thread is identified by a bold arrow in the left margin. This thread receives user input and is automatically created by the operating system when a process (an instance of an application) is created. The active thread - the one from which the debugger regained control - is identified by a normal arrow in the left margin. The columns of the Thread window have the following significance:

| Column | Meaning                                                                                                                                           |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| ID     | Thread id number. Thread ids are unique within a process.                                                                                         |
| Status | Status. Possible values of this field are:<br>Frz - the thread is "frozen" (suspended)<br>Thw - the thread is "thawed" (resumed or not suspended) |

### To open the Threads window

- Choose View (or Window) ▶ Threads.

### Tasks

[Debugging Threads](#)

[Debugging a Single Thread](#)

[Resuming Other Suspended Threads](#)

[Suspending a Thread](#)

[Suspending Other Threads](#)

[Viewing Source for a Selected Thread](#)

[Viewing the Active Variables in a Thread](#)

[Viewing the Call Stack for a Thread](#)



## Changing Source Code



## Correcting your source code

```
{button Concepts,AL('Debugging Your Program',0,'')} {button See  
Also,AL('Adding_Code_to_a_Java_Source_File_howto',0,'')}
```

If there are syntax errors in your source code, Visual Cafe flags them in the Messages window after a compile. You can easily navigate to each error directly from the Messages window.

1. Choose View (or Window) ► Messages to bring the Messages window to the front.
2. Double-click any error message to go to that error.

The file containing the error opens at the offending line within a Source window. Once the file opens, you can work on your source code. If you are using [incremental debugging](#), you can change your code and compile-time errors are reported in the Messages window the same as always.

## Using the Source window during debugging

```
{button Concepts,AL('Debugging Your Program',0,'')} {button See  
Also,AL('Adding_Code_to_a_Java_Source_File_howto',0,'')}
```

The [Source window](#) is the primary debugging window; it is where you see your code at its current point of execution. When you debug your program, you can open the Source window containing the current line of code, if possible. Sometimes Visual Cafe cannot open the Source window because you may not have all the source, for example.

When you are in [debug mode](#), the Source window provides extra functionality allowing you to manipulate breakpoints and specify variables to watch in the Watch window.

You can also examine variables and evaluate expressions that you select in the Source window.

## Breakpoints



## Setting breakpoints

{button How To,AL('Setting a Breakpoint on a Line Number;Setting a Breakpoint on a Method Name;Setting a Breakpoint on a Variable or Expression;Setting a Conditional Breakpoint;Setting\_Breakpoints',0,',')} {button See Also,AL('Clearing a Breakpoint;Toggling a Breakpoint;Stepping Code After a Breakpoint',0,',')}

You can set breakpoints anywhere in your code to stop execution at a particular line and regain control after starting your program. When your program breaks at a breakpoint you can examine variable values, single step your program, or examine the state of your program in any way you want.

In Visual Cafe, you can set a breakpoint on:

- the current line in the Source window
- a specific line number
- a method name
- the condition of a variable or expression

## Managing breakpoints

```
{button How To,AL('Clearing a Breakpoint;Editing Breakpoints;Enabling or Disabling a Breakpoint;Setting a Breakpoint;Viewing all Breakpoints;Viewing Source for a Breakpoint',0,'')} {button See Also,AL('Setting Breakpoints;Stepping Code After a Breakpoint;Ignoring Breakpoints',0,'')}
```

Visual Cafe provides many ways to manage breakpoints, allowing you to stop execution of a program at a specific location and optionally on a predetermined condition, such the value of a variable.

Breakpoints are manipulated either from the [Source window](#) or from within the [Breakpoints window](#), which shows all breakpoints currently defined in your program. You can view or modify the different parameters of any breakpoint and enable or disable the currently defined breakpoints. Use the Breakpoints window to examine the state of breakpoints in your program.

Breakpoints are saved with the source and are made visible each time you open the [project](#). The state of each breakpoint — enabled or disabled — is also saved with the project.



## Setting a breakpoint

{button Concepts,AL('Setting Breakpoints',0,'')} {button See Also,AL('Clearing a Breakpoint;Setting a Conditional Breakpoint',0,'')}

You set a breakpoint directly in a line of source code in the [Source window](#).

1. Click the line where your breakpoint is to be set.
2. Choose Source ► Set Breakpoint, or right-click and choose Set Breakpoint.

The breakpoint is set, indicated by a diamond symbol in the left margin next to the line of code.

**Tip** You can also set and remove breakpoints on the current line by pressing the F9 function key.



## Setting a breakpoint at a line number

{button See Also,AL(' Clearing a Breakpoint;Setting a Breakpoint on a Method Name;Setting a Breakpoint on a Variable or Expression',0,'','')}

You can have your program break every time a specific line within your current source file is about to be executed.

1. Choose Source ► Set Conditional Breakpoint.
2.     Select Line number.
3.     Enter a line number in the text box.
4.     Click OK.

The breakpoint is added to the list in the [Breakpoints window](#).





## Setting a breakpoint at a method

{button See Also,AL(^ Clearing a Breakpoint;Setting a Breakpoint on a Line Number;Setting a Breakpoint on a Variable or Expression',0,'','')}

You can have your program break every time a specific method is executed by setting a breakpoint at a method name.

1. Choose Source ► Set Conditional Breakpoint.
2. Select Method name.
3. Enter a method name in the text box.
4. Click OK.

The breakpoint is added to the list in the [Breakpoints window](#).

## ▶ **Setting a conditional breakpoint**

{button Concepts,AL('Setting\_Breakpoints',0,'')} {button See Also,AL('Clearing a Breakpoint;Modifying a Conditional Breakpoint',0,'')}

A conditional breakpoint pauses the execution of your program when a specified condition is met. In Visual Cafe, when you set a conditional breakpoint, it is added to the breakpoint list in the Breakpoints window along with the condition you specify.

1. In the Source window, click the line where the breakpoint should occur.
2. Choose Source ▶ Set Conditional Breakpoint.
3. Select If expression is true.
4. Type your breakpoint condition into the text box.

This condition must be an expression that evaluates to true when you want a breakpoint to trigger. When the expression is true, the breakpoint occurs.

**Note** The expression is evaluated, so make sure it evaluates to a boolean. For example,  $n = 64$  would set  $n$  to 64, while  $n == 64$  would be true when  $n$  was 64 during the execution of your program.

5. Click Add.

The breakpoint is added to the list in the [Breakpoints window](#).



## Clearing a breakpoint

{button Concepts,AL('Managing Breakpoints',0,'')} {button See Also,AL('Enabling or Disabling a Breakpoint;Setting a Breakpoint',0,'')}

Clearing a breakpoint deletes it from the set of breakpoints you have defined. This is distinct from disabling a breakpoint, which retains it in your breakpoint list in a temporarily disabled state.

You clear a breakpoint either at a source line (in the [Source window](#) or from the [Class Browser](#), or from the list maintained in the [Breakpoints window](#).

### To clear a breakpoint at a line of source code

1. Select the breakpoint by clicking in the line where your breakpoint is set (the breakpoint is denoted with a diamond symbol in the left margin).
2. Choose Source ► Clear Breakpoint, or right-click and choose Clear Breakpoint.

### To clear a breakpoint from the Breakpoints window

- Select one or more breakpoints in the list and press DELETE.
- Select one or more breakpoints, then choose Breakpoints ► Clear, or right-click and choose Clear.
- To clear all breakpoints, then choose Breakpoints ► Clear All, or right-click in the Breakpoints window and choose Clear All.

When the breakpoint is cleared, the diamond symbol is removed from the left margin of the line of source code, and the item is removed from the Breakpoints window.



## Enabling or disabling a breakpoint

```
{button Concepts,AL('F1_Breakpoints_Window',0,'')}
```

The checkbox preceding each breakpoint in the [Breakpoints window](#) indicates whether or not that breakpoint is enabled. When checked, the breakpoint is enabled. In the [Source window](#), disabled breakpoints appear as empty red diamonds.

You can enable or disable a breakpoint by clicking the breakpoint's checkbox.

### To enable a breakpoint

- Find the breakpoint in the list and click the empty checkbox corresponding to that breakpoint. When the box is checked, the breakpoint is enabled.

### To disable a breakpoint

- Find the breakpoint in the list and click the checked box corresponding to that breakpoint. When the box is empty, the breakpoint is disabled.


**Note** Disabling a breakpoint does not delete it from the Breakpoints window.



## Toggling a breakpoint

{button Concepts,AL('Setting Breakpoints',0,'')} {button See Also,AL('Clearing a Breakpoint;Setting a Breakpoint',0,'')}

Toggling a breakpoint is a quick way to reverse the state of a breakpoint on any line of source code in the Source window.

1. Click the line where you want to toggle the breakpoint.
2. Click  (Toggle Breakpoint) in the Debug toolbar.

If the breakpoint is set, a diamond symbol appears in the left margin next to the line of code; if it is reset, the diamond symbol is cleared.

**Tip** You can also use the F9 function key to toggle breakpoints.



## Modifying a conditional breakpoint

{button Concepts,AL('Managing Breakpoints',0,'')} {button See Also,AL('Setting a Conditional Breakpoint',0,'')}

You modify a conditional breakpoint by changing the conditions of the breakpoint in the [Breakpoints window](#).

1. Choose View (or Window) ► Breakpoints to display the Breakpoints window.
2. Click the Condition field of the breakpoint you want to change.
3. Type the new condition into the Condition field.
4. Press ENTER to save the change.



## Ignoring breakpoints

```
{button Concepts,AL('Managing Breakpoints',0,'')} {button How To,AL('Running to Program End;Running to the Cursor Location',0,'')}
```

There is an easy way in Visual Cafe to ignore all breakpoints you have set without changing the state of any of the breakpoints in the Breakpoints window. You can do this two ways.

### To run to program end

Ignores breakpoints and runs the program to termination.

- Choose Debug ► Continue to End.

### To run to the cursor location

Ignores breakpoints until execution hits the current line, where execution pauses.

- Choose Debug ► Continue to Cursor.



## Viewing source for a breakpoint

```
{button See Also,AL(`Viewing Source for a Method on the Call Stack;Viewing Source for a Selected Thread',0,';')}
```

In Visual Cafe, you can select any of the breakpoints listed in the [Breakpoints window](#) and view the source code associated with that breakpoint.

1. Choose View (or Window) ► Breakpoints to display the Breakpoints window.
2. Click the breakpoint for which you want to see the source code.
3. Choose the Breakpoints ► Go to Source, or right-click and choose Go to Source.  
The focus in the Source window will be set to the specified breakpoint.



## Stepping through code when the program is paused

```
{button How To,AL('Stepping into a Method;Stepping out of a Method;Stepping over a Method',0,'','')}
```

After your program has hit a breakpoint, you can step through your lines of code one at a time using three techniques.

### Step In

Steps in to the next line of source code. If the program is running and you are paused in the program, this command steps to the next source code statement. If the current line is a method call, Step In steps inside the method. If the method is in another source file, that file is opened to the next line of source code.

### Step Over

If the current statement is a method call, the program executes to the next statement following the call. Step Over executes the program to the next statement (unless a breakpoint or an exception is encountered before execution reaches that point).

### Step Out

This command executes to the current method's return address (unless a breakpoint or an exception is encountered before execution reaches that point).

**Note** If a variable is declared, but not used, the debugger will step over that declared statement.



## Stepping into a method

```
{button Concepts,AL('Stepping_Through_Code_When_the_Program_is_Paused',0,'')} {button See Also,AL('Stepping out of  
a Method;Stepping over a Method',0,'')}
```

After your code has hit a breakpoint, you can choose to single step by stepping into any method call contained in the next line to be executed. This causes the single step to land at the first line of the called method.

- Choose Debug ► Step Into.

**Note** If the next line to be executed does not contain a method call, Step Into performs a single step of the line.

To start debugging and pause at the first line, choose Project ► Step Into. When used on an applet, this command takes you to the applet constructor.



## Stepping over a method

```
{button Concepts,AL('Stepping_Through_Code_When_the_Program_is_Paused',0,'')} {button See Also,AL('Stepping into a Method;Stepping out of a Method',0,'')}
```

You can step over a method call contained in your code after the debugger has hit a breakpoint. This causes the single step to execute the called method in its entirety and land on the next line of code in your source.

- Choose Debug ► Step Over.

**Note** If the next line to be executed does not contain a method call, Step Over performs a single step of the line.



## Stepping out of a method

```
{button See Also,AL('Stepping into a Method;Stepping over a Method',0,'')}
```

If you hit a breakpoint in a method and want to execute the rest of that method returning to the caller, you can choose to step out of the currently executing method.

- Choose Debug ▶ Step Out.

## Debugging Variables, Expressions, Methods

## Viewing and modifying variables

{button How To,AL('Modifying a Variable in the Variables Window;Modifying a Variable or Expression in the Watch Window;Viewing the Value of a Variable',0,'')} {button See Also,AL('Viewing Type Information for a VariableWindow;Viewing the Active Variables in a Thread;Viewing Variables for a Method on the Call Stack;Watching a Variable or Expression',0,'')}

In Visual Cafe, you can examine any of the variables in your program while in [debug mode](#).

Your program's variables are displayed in the Variables window which displays local variables, global variables, and objects that are local to the current method. You can examine objects and array data elements as well as simple data types.

When you pause the execution of your program, you can modify the value of a variable and then continue execution with the new value in place.

You can modify the value of a variable from the [Variables window](#), the [Watch window](#), or the Evaluate Expressions dialog box.



## Viewing the value of a variable

{button Concepts,AL('Viewing and Modifying Variables',0,'')} {button See Also,AL('Modifying a Variable in the Variables Window',0,'')}

You can view a variable by selecting its name from the [Variables window](#).

1. Choose View (or Window) ► Variables.  
The Variables window opens, displaying all the variables in the current context of the program.
2. To expand an object to see its contents, click the plus sign to the left of the object you want to expand.



## Viewing type information for a variable

{button Concepts,AL('Viewing and Modifying Variables',0,'','')}

You can view a variable's type from the [Variables window](#).

1. Choose View (or Window) ► Variables.  
The Variables window opens, displaying all the variables in the current context of the program.
2. Click the variable whose type you want to view.  
The variable's type is shown in the Type column.





## Watching variables and expressions

{button How To,AL('Watching\_a\_Variable\_or\_Expression',0,'')} {button See Also,AL('Deleting a Variable or Expression from the Watch Window;Modifying a Variable or Expression in the Watch Window',0,'')}

In Visual Cafe, you can specify variables and expressions that you want to watch while debugging your program. The variables that you elect to watch are displayed in the [Watch window](#), which is only available when you pause a running program.

You can also modify the value of a variable using the Watch window.

**Caution** Since the program is paused, do not enter a watch expressions that rely on calls to other components.



## Watching a variable or expression in the Watch window

{button Concepts,KL('Watching Variables and Expressions',0,'')} {button See Also,AL('Deleting a Variable or Expression from the Watch Window;Modifying a Variable or Expression in the Watch Window',0,'')}

You can watch a variable or expression while debugging by adding the variable name to the [Watch window](#).

There are two ways to do this: directly from the Watch window, or from the [Variables window](#).

**Caution** Since the program is paused, do not enter a watch expressions that rely on calls to other components.

### To add it by dragging and dropping

- Drag an item from the Variables window to the Watch window.

### To add it by typing the name

1. Choose View (or Window) ► Watch to display the Watch window.
2. Type a variable name or an expression directly into the Watch field of the Watch window.

### To add it from a dialog box

1. Right-click the variable you want to watch.
2. Choose Evaluate Expression from the pop-up menu.
3. In the dialog box, click Add Watch.

The Watch window evaluates and immediately displays the value of the variable or expression.



## Adding a variable in the Watch window

{button Concepts,AL(^Watching Variables and Expressions',0,';')} {button See Also,AL(^Deleting a Variable or Expression from the Watch Window;Watching a Variable or Expression',0,';')}

You can add a variable directly in the [Watch window](#). The Watch window can also be used for modifying and delete variables in place while your program is in [debug mode](#).

1. Choose View (or Window) ► Watch.

All the variables and expressions you have chosen to watch are displayed in the Watch window.

2. Start typing the name of the variable in the window.

As you begin to type, the window changes to edit mode for the column of the selected row.

3. Press ENTER to save or ESCAPE to leave the item unchanged.

## Modifying a variable or expression in the Watch window

{button Concepts,AL(^Watching Variables and Expressions',0,';')} {button See Also,AL(^Deleting a Variable or Expression from the Watch Window;Watching a Variable or Expression;Adding\_a\_variable\_in\_watch\_window\_howto',0,';')}

You can change the variable name or expression you elected to watch at run time directly from the [Watch window](#). The Watch window can also be used for modifying variables in place while your program is in [debug mode](#).

### To locate the variable you want to modify

1. Choose View (or Window) ► Watch.  
All the variables and expressions you have chosen to watch are displayed in the Watch window.
2. Click the variable or expression you want to change.

### To change the value of a variable

1. Click in the Value field.
2. Type the new value in the Value box.

### To change the variable or expression to watch

1. Click in the Watch field.
2. Edit the variable or expression.
3. Press ENTER to save the change.

**Note** To modify the value of an array or any structured type, edit the individual array's fields or elements. You cannot edit an entire array or structure at once.

**Caution** Since the program is paused, do not enter a watch expressions that rely on calls to other components.



## Deleting a variable or expression from the Watch window

{button Concepts,KL('Watching Variables and Expressions',0,'')} {button See Also,AL('Watching a Variable or Expression;Modifying a Variable or Expression in the Watch Window;Adding\_a\_variable\_in\_watch\_window\_howto',0,'')}

When you have finished watching a run-time variable or expression, you can delete it directly from the Watch window.

1. Choose View (or Window) ► Watch.

All the variables and expressions you have chosen to watch are displayed in the Watch window.

2. Click the variable or expression you want to delete from the list.
3. Press DELETE.

The selected entry is deleted from the Watch window. You can also delete multiple entries.



## Modifying a variable in the Variables window

```
{button Concepts,KL('Viewing and Modifying Variables',0,'','')}
```

You can modify a variable by selecting its name from the [Variables window](#) and typing a value into the value column.

1. Choose View (or Window) ► Variables.

The Variables window opens, displaying all the variables in the current context of the program.

2. Click the variable you want to change.
3. Click in the Value column.
4. Type the new value in the Value box.
5. Press ENTER to save the change.

**Note** To modify the value of an array or any structured type, edit the individual array's fields or elements. You cannot edit an entire array or structure at once.



## Viewing parameters for a method on the call stack

{button Concepts,AL('F1\_Call\_Stack\_Window',0,'')} {button See Also,AL('Viewing Variables for a Method on the Call Stack;Viewing Code for a Method on the Call Stack',0,'')}

You can view the parameters passed to a [method](#) on the call stack when that method was called. Visual Cafe allows the display of both values and types for each parameter passed.

To open the [Calls window](#), choose View (or Window) ► Call Stack.

### To view parameter types

- Choose Calls ► View Parameter Types.

This toggles the display of parameter types in the Procedure column of the Calls window.

### To view parameter values

- Choose Calls ► View Parameter Values.

This toggles the display of parameter values in the Procedure column of the Calls window.



## Viewing variables for a method on the call stack

{button Concepts,AL('F1\_Call\_Stack\_Window',0,'')} {button See Also,AL('Viewing Parameters for a Method on the Call Stack;Viewing Code for a Method on the Call Stack',0,'')}

You can view the values of variables for any method on the call stack. Only the variables in scope at the time the method entered the stack can be viewed.

1. Choose View (or Window) ► Call Stack to display the Calls window.
2. Click the Method whose variables you want to view.
3. Choose Calls ► Go to Variables.  
This opens the [Variables window](#) that lists the variables in the selected call.





## Viewing source for a method on the call stack

{button Concepts,AL('F1\_Call\_Stack\_Window',0,'')} {button See Also,AL('Viewing Parameters for a Method on the Call Stack;Viewing Variables for a Method on the Call Stack',0,'')}

Visual Cafe allows you to choose any method entered on the call stack and view the source code for that method.

1. Choose View (or Window) ► Call Stack to display the Calls window.
2. Click the Method whose code you want to view.
3. Choose Calls ► Go to Source.

This opens the [Source window](#) for the selected call.

## Threads

## Working with threads

```
{button How To,AL('adding_thread_to_a_project_howto;debugging a single thread;viewing the call stack for a thread;resuming a suspended thread',0,'')} {button See Also,AL('Projects_overview;Running_and_Debugging_Applications;Object_Library_F1;Differences_between_Applets_and_Applications',0,'')}
```

A thread is a process in a program that has a beginning and an end. In [applications](#), the **main** method is responsible for indicating the beginning and end of the program. In [applets](#), the Web browser uses various methods to control the program flow.

However, programs are not limited to performing a single process. Java programs can use threads to perform multiple processes simultaneously. This is called *multithreading*. For example, suppose you are using a text editor to type a letter and you want to save your changes before you continue. If the text editor program is single-threaded, when you save the file, the rest of the program must wait until the file is completely written to the hard disk.

In a multithreaded application, the process that saves the file can be an independent thread with its own beginning and end. When you save the file, the file-saving thread starts and runs in parallel with the application's other processes. You can continue to type your letter as a copy of the file is written to disk in the background. Multithreaded programs run faster and are more convenient than single-threaded applications.

While debugging, the Visual Cafe Threads window lists the active threads — one per row. The selected thread is highlighted. You can change the selection by clicking a different row, or by using the Up and Down arrow keys. The primary thread is identified by a bold arrow in the left margin. This thread receives user input and is automatically created by the operating system when a process (an instance of an application) is created. The active thread — the one that was active when you entered break mode — is identified by an arrow in the left margin.

When [debugging](#) a multithreaded program, you can select a single thread using the Threads window. The Threads window shows all the extant threads your program has created, and the state of each thread.

You can use the Threads window to:

- Switch easily between threads to debug.
- View the source for a selected thread.
- Update the Calls window with a thread's call chain.
- Update the Variables window to show the variables within the current thread.

To open the Threads window, choose View (or Window) ► Threads.



## Debugging threads

```
{button How To,AL('Debugging a Single Thread;Suspending a Thread;Viewing the Active Variables in a Thread;Viewing the Call Stack for a Thread;Viewing Source for a Selected Thread',0,'')} {button Concepts,AL('Working_with_Threads',0,'')}
```

When debugging a multithreaded program in Visual Cafe, you can work with a single thread in exclusion of others. All the extant threads your program has created display in the Thread window, along with the state of each thread.

You can switch between threads to debug or view the source for a selected thread from the [Threads window](#). You can also update the [Calls window](#) with a single thread's call chain and update the [Variables window](#) to show only the variables within the current thread.



## Debugging a single thread

```
{button Concepts,AL('Debugging Threads;Working_with_Threads',0,'')}
```

If you want to focus your debugging efforts on a specific thread, you can set the focus to that thread and work on it alone.

1. Choose View (or Window) ▶ Threads to display the Thread window.
2. Click the thread you want to work on.
3. Choose Threads ▶ Set Focus.  
This sets the focus of the debugger to the selected thread.
4. Continue debugging that thread in the [Calls window](#), [Variables window](#), or [Source window](#).



## Suspending a thread

{button Concepts,AL('Debugging Threads;Working\_with\_Threads',0,'')} {button See Also,AL('Resuming a Suspended Thread;Resuming Other Suspended Threads;Suspending Other Threads',0,'')}

If you are working on a multithreaded program, you can suspend any specific thread if you suspect it of causing unwanted side effects while your program is running or while you are debugging.

1. Choose View (or Window) ► Threads to display the Thread window.
2. Click the thread you want to suspend.
3. Choose the Thread ► Suspend.  
The selected thread is suspended.



## Resuming a suspended thread

{button Concepts,AL('Debugging Threads',0,'')} {button See Also,AL('Resuming Other Suspended Threads;Suspending a Thread;Suspending Other Threads',0,'')}

If you have suspended any threads to temporarily eliminate their behavior from your program, you can resume any one you choose from the list displayed in the Threads window.

1. Choose View (or Window) ▶ Threads to display the Threads window.
2. Click the thread you want to resume.
3. Choose Threads ▶ Resume.  
The selected thread is resumed.



## Suspending other threads

{button Concepts,AL('Debugging Threads',0,'')} {button See Also,AL(';Resuming a Suspended Thread;Resuming Other Suspended Threads;Suspending a Thread',0,'')}

If you want to focus your debugging attention on a single thread, Visual Cafe allows you to suspend other threads to narrow down the behavior of your program.

1. Choose View (or Window) ▶ Threads to display the Thread swindow.
2. Click the thread you want to work on.  
**Warning** You are choosing all threads other than this one to be suspended.
3. Choose Threads ▶ Suspend Others.

All other threads in the debugger except the one that is selected are suspended.





## Resuming other suspended threads

{button Concepts,AL('Debugging Threads',0,'')} {button See Also,AL(';Resuming a Suspended Thread;Suspending a Thread;Suspending Other Threads',0,'')}

If you have chosen to suspend any threads in a multithreaded program, you can resume all other threads at any time.

1. Choose View (or Window) ▶ Threads to display the Threads window.
2. Click the thread you do not want to resume.

**Warning** You are allowing threads other than this one to resume.

3. Choose Thread ▶ Resume Others.

All other threads in the debugger except the one that is selected are resumed.



## Viewing source for a selected thread

{button Concepts,AL('Debugging Threads;Working\_with\_Threads',0,'')} {button See Also,AL('Viewing the Active Variables in a Thread;Viewing the Call Stack for a Thread',0,'')}

If you want to look at the source code for a specific thread, you can do so from the Threads window.

1. Choose View (or Window) ► Threads to display the Threads window.
2. Click the thread you want to focus on.
3. Choose Threads ► Set Focus.

Set Focus updates the [Source window](#).

4. Look in the Source window.

The thread's source code is visible in the Source window.



## Viewing the active variables in a thread

{button Concepts,AL('Debugging Threads;Working\_with\_Threads',0,'')} {button See Also,AL('Viewing Source for a Selected Thread;Viewing the Call Stack for a Thread',0,'')}

You can view the values of variables for any thread currently executing.

1. Choose View (or Window) ► Threads to display the Threads window.
2. Click the thread you want to focus on.
3. Choose Threads ► Set Focus.  
Set Focus updates the [Variables window](#).
4. Choose View (or Window) ► Variables.  
The Variables window opens displaying the chosen thread's variables.



## Viewing the call stack for a thread

```
{button Concepts,AL('Debugging Threads;Working_with_Threads',0,'')} {button See Also,AL('Viewing Source for a Selected Thread;Viewing the Active Variables in a Thread',0,'')}
```

If you're working on a specific thread and want to see the call stack for that thread alone, Visual Cafe allows you to do so.

1. Choose View (or Window) ► Threads to display the Threads window.
2. Click the thread whose call stack you want to view.
3. Choose Threads ► Set Focus.  
Set Focus updates the [Calls window](#).
4. Choose View (or Window) ► Call Stack.  
The Calls window opens on the thread you selected.
5. Click the Method whose code you want to view.

## Remote Debugging



## **Debugging remotely**

```
{button How To,AL('Ending Remote Applet/Application Debugging;Starting Remote Applet/Application Debugging',0,'','')}
```

Visual Cafe allows you to run a program on one computer and debug it remotely on another. To do this, Visual Cafe and the class files and HTML files need to be located on the remote computer.

Both the local and the remote computer need to have TCP/IP installed and working properly.

## Starting remote program debugging

```
{button Concepts,AL('Projects_overview;Debugging Remotely',0,'','')} {button See Also,AL('Ending Remote Applet/Application Debugging;Setting_Environment_Variables_in_scini_howto',0,'','')}
```

You can debug an applet or application remotely on another computer. You cannot debug native applications or DLLs remotely.

**Important** The class files you are debugging reside on the remote computer and not on the computer where you are running the debugger. So, to have a good debug session, you need to be sure that the remote computer has the debug build of the classes you need, and so on. Also, the remote virtual machine needs to have the class path set in the environment before running `caferemote.exe`. Make sure the class path is set correctly in `autoexec.bat` for Windows 95 or in the Control Panel for Windows NT; `caferemote.exe` can also read classpath information from the `sc.ini` file in your Bin directory.

1. Open a console session on the remote computer by moving to the directory containing the class and HTML files of the program you intend to debug. Execute `caferemote`.

`Caferemote` displays some version information, and then an agent password and the computer's IP address.

2. Click OK.  
Remote debugging is now enabled.
3. On the computer that is running the debugger, load the project corresponding to the class and HTML files you are debugging on the remote computer.
4. Choose Project ► Options.
5. If you are remotely debugging an applet, from the Project tab, specify an HTML file including the full path.
6. From the Debugger tab, choose General from the Category list.
7. Check Enable Remote Debugging and type the Host Address and Agent Password as reported by `caferemote`:

| Field          | Description                                                                                                  |
|----------------|--------------------------------------------------------------------------------------------------------------|
| Host Address   | The IP address of the remote computer.                                                                       |
| Agent Password | The remote computer's password, which is returned by <code>caferemote.exe</code> run on the remote computer. |

6. Click OK.



## Ending remote program debugging

{button Concepts,AL('Debugging Remotely',0,'')} {button See Also,AL('Starting Remote Applet/Application Debugging',0,'')}

On the remote computer, select the Caferemote console window and press CONTROL+C. This terminates the debug session currently in process.

To continue, you need to re-execute caferemote to get a new agent password.



**Obsolete**

## Understanding errors in Java and Visual Cafe

{button How To,AL('clearing a breakpoint;toggling a breakpoint',0,','')} {button See Also,AL('debugging\_applets\_and\_applications;Understanding\_Workspaces;Working\_with\_Exceptions\_in\_Java\_and\_Visual\_Caf;understanding\_the\_visual\_cafe\_debugger',0,','')}

### Common errors

The most common compiler errors result from improper [syntax](#). The compiler can only understand source code that has been formatted correctly. Some of the most common mistakes are:

- Misspelled words (keywords, methods)
- Missing, or incorrect separators (periods, braces, semicolons)
- Improper use of case (capitalization)

One compiler error can generate multiple error messages. For example, you could misspell the name of a [method](#) that you call from your program. Although you misspelled it only once, your program may reference the misspelled method multiple times. The result is multiple compiler errors from a single typing error.

Sometimes the compiler error message will indicate exactly what caused the problem. You may have to inspect the troublesome line of code character-by-character to locate the source of the problem.

### Compiler errors

A compiler error occurs when the compiler does not understand a portion of your source code. Even in the simplest program, it is easy to write code that will result in a compiler error.

There is a difference between compiler errors and programming errors. For example, if source code fails to compile successfully, you have a compiler error. If the source code compiles successfully but does not run as you expect, you have a programming error. It is possible for a program to compile successfully and still not run. Fixing the logic of your program to get it to run the way you want is called debugging your program.

The Messages window displays all of the compiler errors encountered each time you build or compile a program.

### Using Visual Cafe to locate compiler errors

When the compiler encounters an error in the source code, the error is displayed in the Messages window. Double-click the error message to jump to the line containing the error. The editor highlights the error. The integration between the Messages window and the Source window saves you from searching through every line of your code to find an error.

### Java and case sensitivity

Java compilers and interpreters are case-sensitive, meaning that upper case letters are distinguished from lower case letters. `Hello.java` is not the same file as `hello.java`. The different use of capital letters indicates that these files are not the same.

When a `.java` source file is compiled, the compiler creates a file with a `.class` extension. The name that the compiler assigns to that `.class` file is taken from the class definition in the source file. Essentially, the class you define in the source code becomes the name of your program. Like all things in Java, the class definition is case sensitive.

Because of the case sensitive nature of Java code, compilers, and interpreters, it is important to be careful and consistent when you name [projects](#), source files, and [classes](#).

To prevent problems resulting from case sensitivity, get in the habit of always naming the project and the main source file with the same case sensitive name as the class you are creating.

## The Debugging views

```
{button How To,AL('viewing source for a breakpoint;viewing the value of a variable;viewing type information for a variable;watching a variable or expression;viewing variables for a method on the call stack',0,'')} {button See Also,AL('Creating_Interactions;Maintaining_and_Porting_Your_Java_Applets_and_Applications;Projects_overview;Running_and_Debugging_Applications;Object_Library_F1;Understanding_Workspaces;Working_with_Exceptions_in_Java_and_Visual_Caf',0,'')}
```

The debugging views consists of these windows:

### Variables

The Variables window allows you to specify [variables](#) and [expressions](#) that you want to watch continuously while debugging your program. In this window, you can examine the contents of a class variable. To watch all the variables accessible to a method, simply drag the method from the [Calls window](#) into the [Variables window](#).

You can add a variable name or an expression to the Variables window by clicking in a cell and typing the name. Variables can be modified by double-clicking in the Value cell and entering a new value. After modifying a variable you can continue debugging from the current line without having to stop and restart the debug session.

### Calls

The Calls window lists the method calls a program has made since it began running. This list is known as the [call stack](#). The [methods](#) in the call stack are displayed in reverse order from the last (most recent) call on top to the first (initial) call on the bottom. Each entry lists the name of the method followed by the name of the class which contains the method.

### Threads

The Thread window displays the [threads](#) that your program has created. A thread is a process that is controlled by your program. It is possible to create programs that have more than one process (thread), running at the same time.

**Note** If you are using multiple threads in your program, each thread has its own call chain. Drag a thread from the thread window and drop it on the call window to see the call chain for individual threads.

### Breakpoints

The Breakpoints window is used to display a list of breakpoints currently set in the source code. Breakpoints are flags you can insert into the code at specific points that cause the program execution to pause. When the debugger goes through the instructions, it stops whenever it encounters a breakpoint. You can check on the value of the data and other program conditions.

### Source window

The Source window is the primary debugging view: it is where you add, edit, and view code. When debugging an application, Visual Cafe automatically opens the Source window containing the current line of code.



## Handling exceptions

When running your program, you can choose to have all exceptions break into the debugger, or to have only unhandled exceptions break into the debugger.

### To prepare for handling exceptions

1. Choose Project ► Options.
2. In the dialog box that appears, click the Debugger tab.
3. Choose how you want to handle exceptions, and add exceptions to the list.

### To have all exceptions break into the debugger

1. Select the exception in the list.
2. Click in the Action column.
3. Click the down-arrow button and choose Stop Always.

### To have only unhandled exceptions break into the debugger

- Select the exception in the list.

You check a checkbox next to an item that you want *always* to pause the debugger. The default behavior is for unchecked items to pause the debugger if they are not handled in source code.



## Setting a breakpoint at a variable or expression

```
{button See Also,AL(' Clearing a Breakpoint;Setting a Breakpoint on a Line Number;Setting a Breakpoint on a Method Name',0,'','')}
```

You can have your program break whenever a variable reaches a specific value or an expression of your choice becomes true.

A breakpoint symbol in the left margin of the Source window indicates a breakpoint on the adjacent line.

1. Choose Source ► Set Conditional Breakpoint.
2.     Select If expression is true.
3.     Type a Boolean expression into the text box.

This condition must be an expression that evaluates to true. When the expression is true, the breakpoint occurs.

**Note** The expression is evaluated, so make sure it evaluates to true. For example, `n =64` would set `n` to 64, while `n==64` would be true when `n` was 64 during the execution of your program.

4. Click OK.

The breakpoint is added to the list in the [Breakpoints window](#).

# Glossary

This is the glossary for Visual Cafe, Visual Cafe Database Development Edition, and dbANYWHERE:

- Definitions
- URLs (not pop-ups because they're too large)
- dbawdsn.ini fields (for dbANYWHERE)
- Fields in Data Source configuration files (for dbANYWHERE)

## How it was created

1. Started with defin.doc (the glossary for Visual Cafe).
2. Put entries in alphabetical order.
3. Added definitions from the Pro glossary (progloss.doc) and the dbaw glossary (db\_pop.doc).
4. Verified that all definitions in the Visual Cafe User's Guide glossary (defin.doc) are already in here.
5. Created and attached glossary.dot for the styles (glossary.dot is a revised version of robortf.dot).
6. Combined duplicate entries.
7. Modified descriptions (so that they are clearer).
8. Added descriptions: JDK, Java API, Hierarchy Editor, dbNAVIGATOR, Project window, Form Designer, server, foreign key, optimistic concurrency, primary key, stored procedure.
9. Create the main glossary topic which can be added to the .cnt files. For the bitmaps, I used the samples provided on the CD that came with *Developing Online Help* by Boggan, Farkas, and Welinske. You may want to use different bitmaps because I don't know if it's legal to use these and because someone can probably create more attractive ones.

## Ramifications

1. Files for projects: Each help project needs to:
  - Delete the current glossary/definitions file (defin.doc, progloss.doc, or db\_pop.doc).
  - Add this file (gloss.doc).
  - Make whatever modifications are necessary to access the definitions in this file.
2. Duplicate entries:
  - debug mode: Kept the Debug\_mode\_glossary topic ID. Deleted the Break\_mode\_glossary topic ID.
  - Java Virtual Machine: Kept the Java\_Virtual\_Machine\_glossary topic ID. Deleted the Java\_VM\_Java\_Virtual\_Machine topic ID.
  - database view, global view, and two views: Deleted database view and global view (this information was in the other view definitions). Combined the two view definitions. Kept the View\_glossary topic ID. Deleted the global\_view\_glossary and view topic IDs (there were two of these).
  - URLs: Deleted the URL entry because it has been superseded by the dbANYWHERE Server machine URL entry. Deleted the URL topic ID.
  - class method, instance method, method: Deleted the class method and instance method entries. Kept the Method\_glossary topic ID. Deleted the Class\_method\_glossary and Instance\_method\_glossary topic IDs.
  - component and visual object: Deleted the visual object entry and its Visual\_Object\_glossary topic ID. Kept the Component\_glossary topic ID.
3. Changed entry names:
  - Changed class variable and instance variable to variable. Kept the Class\_variable\_glossary topic ID. Deleted the instance\_variable topic ID.
  - Changed class member to member. Kept the same topic ID.
  - Changed invisible component and non-visible object to hidden component. Kept the Invisible\_object\_glossary topic ID. Deleted the Non\_visual\_object\_glossary topic ID.
4. Deleted entries:

- control (topic ID = Control\_glossary).
5. Since the main glossary topic uses mid-topic jumps, you must redefine the visual window so that it does not auto-size the height.

**To do**

1. action: Make sure all the valid actions are listed.
2. Data Source: what spreadsheets are supported? should this information go in the glossary definition or in the "Installing dbANYWHERE Server" manual?

Main glossary topic



## Glossary

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(none)

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(none)

# Definitions

A

**abstract class**

A class that contains an abstract method and is incompletely defined; that is, at least one method is not complete. You cannot instantiate an abstract class.



## **access type**

Scope of a variable or method:

- **Public:** Accessible from any class.
- **Protected:** Accessible from the class that defines the variable or method and from the class' subclasses.
- **Private:** Accessible from the class that defines the variable or method.
- **Package:** Accessible from any class in the package that defines the variable or method. This is the default access type.

## **action**

Action performed on a database:

- delete: Deletes the current record from the Data Source.
- first: Moves the database cursor to the first record in the database table.
- new: Creates a new record in the database table.
- next: Moves the database cursor to the next record in the database table.
- prev: Moves the database cursor to the previous record in the database table.

**active window**

Window which receives keyboard input. Only one window can be active at any time.

## **adapter**

Classes that implement an interface. The `java.awt.event` package provides, as a convenience, a series of listener classes that can be implemented by classes.

## **anchor component**

Component which acts as the reference point when modifying a group of components. When you select multiple components, the last component selected is the anchor component. It has distinct, colored selection handles.

## **applet**

### **Program**

Special type of Java program that you can add to a Web page. To run an applet:

- Add the applet to a Web page and display the Web page in a Java-enabled Web browser.
- or-
- Run the applet from the Applet Viewer. (The Applet Viewer is a tool that Sun provides with the JDK. The Applet Viewer is also included in Visual Cafe and Visual Cafe Database Development Edition.)

### **Class**

Class in the Java API.

## **applet tag**

An applet tag is HTML code that causes an applet to appear in a Web page. It has the following basic format:

```
<APPLET code="applet.class" width=pixw height=pixh></APPLET>
```

*applet* is the name of the applet.

*pixw* is the number of pixels for the width.

*pixh* is the number of pixels for the height.

Consult an HTML book for more information on the applet tag.

## **application**

### **Program**

Java program you can run from a computer that has the Java Virtual Machine.

### **Template**

Template provided by Visual Cafe (and Visual Cafe Database Development Edition) when you choose File ► New Project

► Basic Application. This template creates a class that is an extension of the Frame class. This class is a good base for a main application window.



B

## **bean**

A component complying with the JavaBeans standard. Also called a JavaBean or a JavaBeans component. A bean is a reusable component that can be visually manipulated in a builder tool. The minimum requirements are that it can be instantiated (it is not an abstract class or interface) and has a class constructor method that takes zero parameters (it has a null constructor). It can also have properties and events, implement the serializable or externalizable interface, and follow method signature rules so it can be introspected.

## **boolean expression**

Expression that evaluates to true or false.

## **Breakpoints window**

Window that contains a list of all breakpoints in a project. Use this window to add, remove, or modify breakpoints. You can set simple breakpoints that stop execution at a certain line or method, or conditional breakpoints based on an expression.

To see the Breakpoints window, choose View (or Window) ▶ Breakpoints.

## **bytecode**

Machine-independent code generated by the Java compiler and executed by the Java interpreter.

C

## **call stack**

An area reserved in memory by the compiler to keep track of all method calls that are made.

## **Calls window**

Debugger window that shows all the active method calls leading to the current process. When an applet or application calls a method, the Java Virtual Machine (Java VM) adds the method to the stack. When the method returns, the Java VM takes it off the stack. The currently executing method is on the top of the stack and the previous methods called are below it. This window is useful for following the flow of your code, for example.

To see the Calls window, View (or Window) ► Call Stack.



## **class**

Collection of variables and methods that you can use to define an object. The variables define the class structure. The methods define the class behaviors.

When compiled as a bytecode program (versus a native Win32 executable), a Java source file becomes one or more class files.

## Class Browser

A three-pane window that lists the Java classes in your project and the methods and data members contained within each class:

- Classes pane — classes
- Members pane — methods and data in the selected class
- Source pane — source code of the selected member

Both the Classes and Members panes support keyboard incremental searches. As you type the name of a class or member, the list of matching items is refined until the class or member you want is automatically selected. You can display classes and members in a variety of views and filter the items that are displayed. The Source pane provides the same editing features as the Source window, while ensuring that you do not unintentionally change code outside of the object's scope.

To see the Class Browser, choose View (or Window) ▶ Class Browser.

**client machine**

Machine that communicates with a dbANYWHERE Server machine to access a Data Source.

## **client software**

Software that dbANYWHERE uses to communicate with a database engine such as:

- Oracle Server client software
- Microsoft SQL Server client software
- ODBC32 Administrator

## component

A JavaBeans component.

- A *visual component* is a user interface element, such as a window, menu, button, and so on, that is visible at run time and appears in the Visual Cafe Project window and Form Designer. It extends from the Java Component class and has a screen position, a size, and a foreground and background color.
- An *invisible component* is not visible at run time, such as a Timer, or displays in a different way in the Form Designer and at run time, such as a MenuBar. It does not extend from the Java Component class. In the Form Designer, an invisible component is represented by an icon that does not effect the form layout.
- Some components can contain other components, such as an application window containing a button; these components are called *containers*. In the Objects view of the Project window, the components in a container appear subordinate to the container, like a file system display. The containers at the top level are separate Java files in your project (called *Visual Cafe forms*), while the components in the containers are Java code within the container Java file.
- To create your user interface, you can display a form in the Form Designer, then drag onto the form a variety of components from the Component Library or Palette; you assign the component properties in a separate Property List window, and add interactions between components with the Interaction Wizard. Visual Cafe automatically creates the Java code for you during this design process.
- Components are like controls in C++.

## Component Library

Collection of components that you can add to your applet or application. When you create a project template or add a component to the Component Palette, Visual Cafe adds the component to the Component Library. To see the Component Library:

View (or Window) ► Component Library

## **Component Palette**

Palette that provides easy access to components. You can place any component in the Component Library on the Component Palette.

**conditional breakpoint**

Breakpoint that lets you stop program execution when a specified expression evaluates to true.



## **connection statistics**

DC messages which occur when a client disconnects. The format for a DC message is:

DC, <client IP address>, <initial connect time>, <connect time duration>, <number of requests processed>

where:

- <initial connect time> is in second since 1970
- <connect time duration> is in seconds

## **ConnectionInfo**

For the dbANYWHERE API, when you use a database wizard or drag a Data Source item to a project, Visual Cafe Database Development Edition creates a ConnectionInfo object, showing the database you are connected to. It includes the default user name and password, which you can remove. The object supports multiple queries and updates simultaneously, reducing database resource requirements.

## **ConnectionManager**

A bean, used with the JDBC API, as a logical container for JdbcConnection beans. Dragging a Data Source item from dbNAVIGATOR to a project creates ConnectionManager and JdbcConnection objects, which manage connections to a data source. You have one ConnectionManager object per project, and one JdbcConnection object per data source. You can also drag ConnectionManager objects to the Component Library.

## **container**

Component that can contain other components. For example, Applet and Panel are containers.

A top-level container, also called a Visual Cafe form, is at the top level in the Objects view of the Project window. It has a corresponding Java file that appears in the Packages and Files views.

**context menu**

Menu that appears when you click the secondary mouse button in a Visual Cafe window. A context menu is often called a pop-up menu.

## **custom code**

Java code that Visual Cafe has not automatically created for you.

D

## **data binding**

The mechanism by which data is automatically passed between components and the data source. The data binding is the same whether your data is being obtained from the JDBC API or the dbANYWHERE API. The components adhere to a standard interface for the binding. If the component is not aware of the data-binding interfaces, the binding can be controlled by a mediator bean.



**data source**

Contains the information for creating a database connection, like the name of the database, its server, and its network location. A data source is what identifies a database to an ODBC- or JDBC-compliant database application. Before you can use your database in a Visual Cafe project, you must create its data source. Sometimes a data source is called a DSN (Data Source Name). For information about the Data Sources dbANYWHERE supports, see the dbANYWHERE manual.

## **database template**

Forms which are pre-designed. You can choose amongst these by using the dbAWARE Template Wizard. Each Visual Cafe database template is designed for a different kind of information.

## **dbANYWHERE (naming conventions)**

|                             |                                                                                                                                                                                                                                                                                               |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| dbANYWHERE Server           | Middleware database software that supports three-tier architecture for database access. Symantec dbANYWHERE is a database connectivity server that provides an implementation of the JavaSoft JDBC API as well as its own powerful java database connectivity API, called the dbANYWHERE API. |
| dbANYWHERE Workgroup Server | Version of the dbANYWHERE Server which is shipped with Visual Cafe Database Development Edition that restricts the number of licenses for use to five.                                                                                                                                        |
| dbANYWHERE Server machine   | Hardware on which dbANYWHERE software is running                                                                                                                                                                                                                                              |
| dbANYWHERE                  | Both versions of dbANYWHERE                                                                                                                                                                                                                                                                   |

## **dbANYWHERE API**

An API developed by Symantec for accessing databases using the dbANYWHERE Server. It is an SQL-level database protocol that makes use of the extensions provided by dbANYWHERE. Symantec dbANYWHERE is a database connectivity server that provides an implementation of the JavaSoft JDBC API as well as its own powerful Java database connectivity API, called the dbANYWHERE API.

## **dbAW subprotocol**

A JDBC subprotocol supported by Symantec dbANYWHERE, which is a JDBC driver. Another JDBC subprotocol supported by Visual Cafe Database Development Edition is ODBC, which is used by the free JDBC-ODBC bridge (another JDBC driver). The JDBC API requires a URL to establish a connection to a database; the subprotocol is part of this URL syntax:

***jdbc:dbaw://host-name-or-IP-address:port-number/data-source-name***

When attempting to connect to a JDBC driver, the Java program makes a connect call, passing the URL to the driver. If the driver recognizes the information in the URL, including the subprotocol, the connection can be made.

## **dbAWARE component**

Visual Cafe component that has additional properties for binding the component to a database row, column, table, or result set.

## **dbNAVIGATOR**

Browser window which shows the servers, data sources, and contents of the data sources that are connected to those servers. You can also use the dbNAVIGATOR perform drag-and-drop operations on your forms and components. To see the dbNAVIGATOR:

View (or Window) ▶ dbNAVIGATOR

## **debug mode**

Temporary suspension of a running program. In debug mode, you can edit code, edit forms, set or clear breakpoints, debug threads, and view the calls on the call stack. After making any edits, restart program execution to see the effect of the changes.

## **Debug toolbar**

Toolbar that has buttons for debugging.



## **Debugging window**

Window for debugging an applet or application. The Debugging window is a special mode of the Source window: It is the Source window while you are debugging.

## **declaration**

Statement that establishes an identifier and associates attributes with it, without necessarily reserving its storage for data or providing the implementation for methods.

**definition**

Declaration that reserves storage for data or provides implementation for methods.

**design time**

Time during which you build an applet or application in the development environment.

**development machine**

Machine that combines a client to a database server and a Java development environment such as Visual Cafe Database Development Edition.

## **dialog box**

Window with a title bar that can receive and process input from a user.

- Applets cannot use dialog boxes.
- Dialog boxes are not suitable for an application's main window.
- Dialog boxes can contain components, but not menus.
- Use dialog boxes for temporary windows.

## **DML**

Data Modification Language, a subset of SQL.

E



**event**

Action or occurrence to which an object can respond. Events are typically user actions that the program can capture and respond to. For example, mouse clicks, key presses, and mouse movements are events.

## **event adapter**

Event listener interface that is implemented as a class.

## **event binding**

Code that enables an object to receive and process an event. It is made of three parts: the event handler, the listener or adapter implementation, and the code to register the listener or adapter to the object triggering the event.

## **event handler**

A method that is called when a certain type of event is triggered. Visual Cafe automatically generates the code needed to bind the occurrence of an event to an event handler when you create an interaction with the Interaction Wizard or from the Events/Methods pull-down menu of the Source window. An event binding is made of three parts: the event handler, the listener or adapter implementation, and the code to register the listener or adapter to the object triggering the event. The default name of an event handler is the object name, followed by an underscore then the name of the action that triggers the event.

## **event listener**

An object that has defined the listener interface for a specific event. After this interface has been implemented in a class, an instance of this class may be registered as an event listener. When an event is generated, the event is sent to the object, as well as all other registered listeners.

**exception**

An event that occurs during the execution of your program that interferes with, disrupts, or stops the normal flow of instructions.

F

**foreign key**

Column or columns in one database table whose values match the primary key in another table. Foreign key columns may or may not be defined as Unique or NOT NULL.



## **form**

A component that can only appear at the top level in the Objects view of the Project window. Applet, Frame, Window, and some dialog components are forms. In the Component Library, the Visual Cafe forms are all in the Forms group. When you open a form in the Form Designer, the form boundaries are the bounds of the window. You can position other components, such as text, buttons, and graphics, on the form; these components are contained by the form.

## **Form Designer**

Window that visually displays form components so you can design the user interface of the form.

## **frame**

Window which can contain components and menus.

G

## **garbage collection**

Automatic detection and freeing of memory that is no longer in use. The Java run time system performs garbage collection so you don't have to explicitly free the memory associated with objects and other data.

H

## **Hierarchy Editor**

Window that displays the class hierarchy for your applet or application. To see the Hierarchy Editor:

View (or Window) ► Hierarchy Editor

I



**identifier**

Name of an item in a Java program.

## **incremental debugging**

A feature that enables you to edit code while your program is executing or paused in the Visual Cafe debugger. Also called runtime editing. You enable this feature by choosing Tools ▶ Environment Options

▶ Debugging.

## **inheritance**

Concept wherein classes automatically contain the variables and methods defined in their superclasses.

## **inner class**

A class that is included within the body of another class, even within a method (called a local class). An inner class is also called a nested class. This feature is new for JDK 1.1 and is useful for creating adapter classes. After compilation, the inner class ends up in its own class file, which has a dollar sign (\$) in its name.

## **instance**

Data item based on a class. An instance of a class is usually called an object. For example, multiple instances of a Form class share the same code and are loaded with the same components with which the Form class was designed. At run time, the individual properties of components on each instance can be set to different values.

## **interaction**

Relationship between two or more components, or a component and itself. The components may be on the same form or on different forms. An interaction consists of:

- One or more components (trigger component and action component)
- Trigger event
- Action

For example, you can connect a button (the trigger component) to a text box (the action component) so that when the user clicks on the button (the trigger event), the associated text box is enabled for user input (the action).

## **interface**

A set of methods and constants to be implemented by another object. It defines the behavior, or certain characteristics, that another object implements. An interface can define abstract methods and final fields, but not the implementation of them.

## **introspection**

The ability to read JavaBeans classes directly with the Core Reflection API using the Introspector class. This information is stored in a BeanInfo object and includes data such as properties, events, and all the accessible methods.



## **invisible component**

Component that is not visible at run time, such as a Timer, or displays in a different way in the Form Designer and at run time, such as a MenuBar. It does not extend from the Java Component class. In the Form Designer, an invisible component is represented by an icon that does not effect the form layout. To toggle between displaying and hiding invisible components at design time:

Layout ► Invisibles

J

## **Java API: Java Application Program Interface**

API provided by the JDK. For more information, see the Java Web page ([java.sun.com](http://java.sun.com)).

**Java file**

File that contains components and Java source code.

## **Java Archive (JAR) file**

Compressed archive file that complies with the JavaBeans standard. It is the primary method for delivering JavaBeans components. For example, a JAR file can contain one or more related beans, and any support files, including classes, icons, graphics, sounds, HTML documentation, serialization files, and internationalization files. You can deploy applets and applications from a JAR file. A JAR tool, called `jar.exe` on Windows computers, archives and extracts JAR files and is provided with JDK 1.1. In Visual Cafe, to use the JavaBeans components in a JAR file, you must first add the file to the Component Library.

## **Java VM: Java Virtual Machine**

Virtual machine provided with the JDK (Java Development Kit). The machine contains:

- Bytecode translator that converts a downloaded binary Java file into instructions that the client machine can execute.
- Library routines that a Java applet calls.

For more information, see the Java Web page ([java.sun.com](http://java.sun.com)).

## **JavaBeans**

A standard for creating portable, cross-platform components.

## **JavaBeans component**

A component complying with the JavaBeans standard. Also called a bean or JavaBean. A bean is a reusable component that can be visually manipulated in a builder tool. The minimum requirements are that it can be instantiated (it is not an abstract class or interface) and has a class constructor method that takes zero parameters (it has a null constructor). It can also have properties and events, implement the serializable or externalizable interface, and follow method signature rules so it can be introspected.



## **JDBC API**

An API developed by JavaSoft as a standard SQL-level database protocol. JDBC, based on ODBC, is a database extension to Java. The Visual Cafe Database Development Edition implementation of the JDBC API includes the Symantec JDBC components, in addition to the base JDBC. While it is not an acronym, JDBC is often thought of as the Java Database Connectivity protocol.

## **JDBC-ODBC bridge**

A free JDBC driver. It supports an ODBC subprotocol of the JDBC API. The JDBC API requires a URL to establish a connection to a database; the subprotocol is part of this URL syntax. For example:

***jdbc:odbc://subname***

***jdbc:dbaw://host-name-or-IP-address:port-number/data-source-name***

When attempting to connect to a JDBC driver, the Java program makes a connect call, passing the URL to the driver. If the driver recognizes the information in the URL, including the subprotocol, the connection can be made.

## **JdbcConnection**

A bean, used with the JDBC API, that represents a connection to a database. It has properties for establishing connection parameters in accordance with JDBC. Dragging a Data Source item from dbNAVIGATOR to a project creates ConnectionManager and JdbcConnection objects, which manage connections to a data source. You have one ConnectionManager object per project, and one JdbcConnection object per data source. You can drag either of these objects to the Component Library.

## **JDK: Java Developer's Kit**

Tools for developing Java applets and applications. The JDK is included in Visual Cafe and Visual Cafe Database Development Edition. It is also available on the Java Web page ([java.sun.com](http://java.sun.com)).

## **join**

Any database query that produces data from more than one table. As its name suggests, a join brings together data from the specified tables.

K

L

## **layout**

Property for container objects like forms and panels. The Layout property automatically arranges components in a container so that they display well on different platforms, Web browsers, screen sizes, and resolutions.



## **list binding**

Data binding that lets you display data from multiple database columns. List binding is helpful for populating list boxes.

## **local variable**

Data item defined within a block of code and accessible only by the code within the block. For example, a variable defined in a Java method is a local variable and can't be used outside the method.

M

**macro**

Sequence of keystrokes. The Source editor's macro facilities let you record, save, and edit macros.

## manifest file

A file that describes the contents of an archive, such as a JAR. The file provides information on certain parts of the archive and can provide information about any JavaBeans in a JAR. It is made of sections separated by empty lines. Each section has one or more headers. Each header uses a *attribute:value* format where *attribute* specifies various attributes of the archive contents and *value* is the relative name of the file being described. Attributes used include Manifest-Version, Name, Java-Bean, Digest-Algorithms, and XXX-Digest (related to Digest-Algorithms). See Sun Microsystem's Manifest File specification for more information.

## **master/detail relationship**

A one to many relationship between two database tables. The join property of the detail QueryNavigator or RelationViewPlus component defines the column of the master view which is the common attribute in the one to many relationship between the tables. For instance, you might want to generate a result set which enumerates all customers who purchased a product called the Spectacular Widget. You create this master/detail relationship by joining the Spectacular Widget column of a Sales table (which also has columns for numbers of sales and price) in an SQL query that returns a list of all the customers in a Customer database table who purchased a Spectacular Widget.

## **mediator**

Bean that lets you make a component database-aware. It is a bridge between the component and the QueryNavigator or RelationViewPlus components.

At design time, you can add a Mediator component to a form in a project and set its properties for a particular component on the form. If you are creating a JavaBeans component or have access to the component Java code, you can add a mediator to the component code, thereby encompassing its functionality within your component.

## **member**

Variable or method defined in a class.



## **method**

Behavior that acts on an object. A method is defined in a class.

- Class method: Method invoked using a class name.
- Instance method: Method invoked using the name of an instance (object).

## Messages window

Window that displays all Visual Cafe informational and error messages. For example, if Visual Cafe detects an error during parsing, the error message is displayed here. You can double-click an error message to open the file in which the error was detected. To see the Messages window:

View (or Window) ▶ Messages

## **modal**

Window or dialog box behavior that requires you to take some action before the focus can switch to another window or dialog box.

**modeless**

Window or dialog box behavior that does not require you to take some action before the focus can switch to another window or dialog box.

N

## **nested class**

A class that is included within the body of another class, even within a method (called a local class). A nested class is also called an inner class. This feature is new for JDK 1.1 and is useful for creating adapter classes.

O

## **ODBC**

Open DataBase Connectivity, a standard interface for communicating with databases. The dbANYWHERE server uses this interface to communicate with many of the databases it supports. The dbANYWHERE server also communicates to other major database types through direct native calls to the client APIs (application programming interfaces) for those databases.



## **ODBC subprotocol**

A JDBC subprotocol supported by the JDBC-ODBC bridge, which is a free JDBC driver. (Each JDBC driver supports certain subprotocols.) Another subprotocol supported by Visual Cafe Database Development Edition is dbAW, which is used by Symantec dbANYWHERE. The JDBC API requires a URL to establish a connection to a database; the subprotocol is part of this URL syntax:

**`jdbc:odbc://subname`**

When attempting to connect to a JDBC driver, the Java program makes a connect call, passing the URL to the driver. If the driver recognizes the information in the URL, including the subprotocol, the connection can be made.

## **object**

Instance of a class.

## Objects view

View of a project that displays only visible components. To toggle between displaying and hiding hidden components at design time:

Layout ▶ Invisibles

## **optimistic concurrency**

Locking technique that maximizes concurrency. The database management system (DBMS) locks data that is being modified but leaves alone data that is being viewed.

## **overloading**

Using one identifier to refer to multiple items in the same scope. In Java, you can overload methods but not variables or operators.

## **overriding**

Providing a different implementation of a method in a subclass of the class that originally defined the method. Overridden methods have the same name but take different parameters.

P

## **package**

Group of classes and interfaces.



## **Packages view**

View of a project that displays both visible and hidden components. To toggle between displaying and hiding hidden components at design time:

Layout ▶ Invisibles

## **panel**

Container that you can add to another container. A panel doesn't have a visible border. You can use a panel to group a window into logical regions.

**ping: Packet INternet Groper**

Network message that a computer transmits to check for the presence, connectedness, and responsiveness of another computer. The other computer responds by echoing the message back to the first computer.

## **primary key**

Column or columns in a database table that uniquely identify a record. A value in a primary key column cannot be NULL and must be unique.

**project**

Set of components and code that comprise an applet or application.

## **project template**

Collection of components that you can use as the foundation for an applet or application. When you choose a template for a new project, the new project inherits all of the template's components. For example, you can create project templates for Web sites, single documents, and applets.

## **Project window**

Window that displays a project's objects or packages depending on which tab you select.

## **projection binding**

Data binding to one row in a database column.



## **property**

Attribute of a component. Properties define component characteristics such as size, color, label, or the state of an object, such as enabled or disabled. The Property List displays the properties of a project's components. To see the Property List:

View (or Window) ► Property List

## Property List

Window that displays a component's properties. To see the Property List:

View (or Window) ▶ Property List

Q

## QueryNavigator

A bean, used with the JDBC API, that manages a set of records. Dragging a Data Table item from dbNAVIGATOR to a form in a project creates a top-level RecordDefinition object and a QueryNavigator object, which is contained by the form. You can think of the RecordDefinition component as the data, and the QueryNavigator component as a way of looking at the data. After you have a QueryNavigator and RecordDefinition component in a project, you can create a master/detail relationship. You can drag a QueryNavigator object to the Component Library.

R

## **RecordDefinition**

A bean, used with the JDBC API, that is used to define and access a row of data in a database table. Dragging a Data Table item from dbNAVIGATOR to a form in a project creates a top-level Record Definition object and a QueryNavigator object, which is contained by the form.

**refresh**

Updates the dbNAVIGATOR window to reflect changes made to database tables and columns it is displaying.

## regular expression syntax

Syntax that lets you perform regular expression matching. Regular expressions are wildcard characters. The pattern you search for can be a text string or a regular expression.

### Wildcard characters

|         |                                                                                                                                                                                                                                                               |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ?       | Any character.                                                                                                                                                                                                                                                |
| *       | Zero or more occurrences of any character.                                                                                                                                                                                                                    |
| @       | Zero or more occurrences of the previous character or expression.                                                                                                                                                                                             |
| % or <  | Beginning of a line.                                                                                                                                                                                                                                          |
| \$ or > | End of a line.                                                                                                                                                                                                                                                |
| [...]   | Any of the characters listed between [ and ]. You can use a hyphen (-) to specify a range of characters. For example, [abc] matches a, b, or c; [a-z] matches any lowercase letter; [A-Za-z] matches any upper or lowercase letter.                           |
| [~...]  | Any character except those listed between [~ and ]. You can use a hyphen (-) to specify a range of characters. For example, [~A] matches any character but A; [~abc] matches any character except a, b, or c; [~A-Za-z] matches any non-alphabetic character. |
| \       | Take the following character literally instead of using it as a wild card character. For example, you can use \ <code>*</code> to search for an asterisk or \ <code>\</code> to search for a backslash character.                                             |
| \t      | Tab character.                                                                                                                                                                                                                                                |
| \f      | Formfeed character.                                                                                                                                                                                                                                           |

### RelationViewPlus

Database-aware component that shows a view of a database and is used with the dbANYWHERE API. It provides a simple, property-driven solution for defining and maintaining a result set. It is invisible at run time but contains methods used to handle navigation and data manipulation operations on the data in the result set. (The "Plus" was added when the data binding changed in later versions of Visual Cafe Database Development Edition.)



**result set**

Set of data which is returned by a query on a database(s). An example of a result set might be the data from all the rows in an employee database table which have 200 as their department identification number.

## **run mode**

Mode wherein your applet or application is running. In run mode:

- You can interact with your program as a user.
- Visual Cafe replaces the Project Menu with the Debug Menu.

## **run time**

Time when your applet or application is running. At run time:

- You can interact with your program as a user.
- You can pause the application and start debugging by pressing CONTROL+BREAK.

S

## **scope**

Access type of a variable or method:

- **Public:** Accessible from any class.
- **Protected:** Accessible from the class that defines the variable or method and from the class' subclasses.
- **Private:** Accessible from the class that defines the variable or method.
- **Package:** Accessible from any class in the package that defines the variable or method. This is the default access type.

## **Session**

For the dbANYWHERE API, when you use the database wizard or drag a dbANYWHERE Server item to a project, Visual Cafe Database Development Edition creates a Session object, indicating the dbANYWHERE Server you are connected to through sockets.

**server**

- Database server: Computer that stores and manages a database.
- dbANYWHERE Server: Computer that runs dbANYWHERE, the middleware database software from Symantec which supports three-tier architecture for database access.
- File server: Computer that stores programs and data files.
- Web server: Computer that stores and sends out Web pages in response to HTTP requests from Web browsers.

## **Source pane**

Pane in the Source window and Class Browser that lets you view and edit code.



## Source window

Window that displays and lets you edit a Java source file, an HTML file, or a text file. The Source window is also available when you are debugging. To see the Source window:

- Select a file in the Project window, then choose Object ► Edit Source, or right-click and choose Edit Source.
- Double-click a file in the Packages or Files view of the Project window.
- Double-click in the Form Designer.
- Open a file by choosing File ► Open.

## **SQL**

Standard query language which is used for retrieving information from a relational database. The acronym stands for Structured Query Language.

## **SQL statement**

SQL string used to query a database and thereby define a view. If the string is in the standard SELECT statement format as shown below, the Visual Cafe Database wizards and Join Definition dialog box can parse the string and edit it for you. If the string is not in the standard SELECT statement format, you need to use the SQL Statement dialog box to edit the string manually.

### **Standard format**

```
SELECT column[, column ...] FROM table WHERE condition
```

### **Example**

```
SELECT emp_fname, emp_lname, location_id FROM emp_info WHERE location_id BETWEEN 10 AND 20
```

## **stored procedure**

Collection of SQL statements that is named and precompiled.

Procedures and triggers store procedural SQL statements in a database for use by all applications.

Procedures and triggers can include control statements that allow repetition (LOOP\_statement) and conditional execution (IF\_statement and CASE\_statement) of SQL statements.

Procedures are invoked with a CALL\_statement, and use parameters to accept values and return values to the calling environment. Procedures can also return result sets to the caller. Procedures can call other procedures and fire triggers.

Triggers are associated with specific database tables. They are invoked automatically (fired) whenever rows of the associated table are inserted, updated or deleted. Triggers do not have parameters and cannot be invoked by a CALL statement. Triggers can call procedures and fire other triggers.

User-defined functions are one kind of stored procedure that returns a single value to the calling environment. User-defined functions do not modify parameters passed to them. They broaden the scope of functions available to queries and other SQL statements.

T

**thread**

Path of execution in a running application. For example, an application can have threads that handle background processes that aren't visible to the user.

## Threads window

Debugger window that displays all the existing threads your program has created and the state of each thread. You can pause individual threads, which causes their execution to cease temporarily while all other threads continue to execute, and resume them. This helps you check for and resolve thread synchronization errors, where more than one thread is in contention for the execution of a method. Double-clicking a thread in this window updates the Calls window, so it reflects the scoping level of the thread.

To see the Threads window, choose View (or Window) ▶ Threads.

## **top-level component**

A component that can only appear at the top level in the Objects view of the Project window. Also called a *form*. Applet, Frame, Window, and some dialog components are top-level components. In the Component Library, the Visual Cafe top-level components are all in the Forms group. When you open a top-level component in the Form Designer, the component boundaries are the bounds of the window. You can position other components, such as text, buttons, and graphics, on the top-level component in the Form Designer; these components are contained by the top-level component.



## transaction isolation levels

The *isolation level* defines degree to which the operations in one transaction are visible to the operations in a concurrent transaction. Isolation levels prevent some or all inconsistent behavior and can be different for each connection. All isolation levels guarantee that each transaction will execute completely or not at all, and that no updates will be lost. This ensures recoverability at all times, regardless of the isolation level.

There are three types of inconsistency that can occur during the execution of concurrent transactions:

**Dirty read** — Transaction A modifies a row. Transaction B then reads that row before transaction A performs a COMMIT. If transaction A then performs a ROLLBACK, transaction B will have read a row that was never committed.

**Non-repeatable read** — Transaction A reads a row. Transaction B then modifies or deletes the row and performs a COMMIT. If transaction A then attempts to read the same row again, the row will have been changed or deleted.

**Phantom row** — Transaction A reads a set of rows that satisfy some condition. Transaction B then executes an INSERT, or an UPDATE (that generates one or more rows that satisfy the condition used by transaction A) and then performs a COMMIT. Transaction A then repeats the initial read and obtains a different set of rows.

Here are the types of transaction isolation levels:

TRANSACTION\_NONE — Transactions are not supported.

TRANSACTION\_READ\_UNCOMMITTED — Lets dirty reads, non-repeatable reads, and phantom reads occur.

TRANSACTION\_READ\_COMMITTED — Prevents dirty reads, but not non-repeatable reads and phantom reads.

TRANSACTION\_REPEATABLE\_READ — Prevents dirty reads and non-repeatable reads, but not phantom reads.

TRANSACTION\_SERIALIZABLE — Prevents dirty reads, non-repeatable reads and phantom reads.

U

V

## **ValueTip**

Interface element in Visual Cafe that displays the value of the variable that is under the cursor in the Source window in debug mode.

## **variable**

Structure in memory which holds data that has been assigned to it. A variable that is defined in a class defines the class' structure.

- Class variable: Variable associated with a class and not with a particular instance of the class.
- Instance variable: Variable associated with an instance of a class (an object).

## **Variables window**

Debugger window that shows the variables that are active in the current context. To change a variable value at run time, edit its value in this window.

To see the Variables window, choose View (or Window) ▶ Variables.

## **view**

### **In a development environment**

Window that shows a particular type of information.

- Global view: View that is accessible from the View (or Window) menu. The global views are: Breakpoints window, Calls window, Class Browser, Component Library, Component Palette, Hierarchy Editor, Output window, Property List, Threads window, Variables window, Watch window.
- Local view: View that is local to a project. The local views are: Project window, Source window.

### **For Data Sources**

A QueryNavigator and a RecordDefinition component, or a RelationViewPlus component, represent a view. A view has three parts:

- It is a collection or set of objects that contain data. You can set focus to one member of the set at a time by scrolling forward and backward through the set.
  - A QueryNavigator component has next and previous methods.
  - A RelationViewPlus component has next and previous methods.
- There is a data model associated with the objects that contain data. Each object has a set of values that can be indexed numerically.
  - A QueryNavigator component has symantec.itools.db.beans.jdbc.RecordDefinition objects. These objects obtain their data model on their own. The Table property is a property of RecordDefinition.
  - A RelationViewPlus component has symantec.itools.db.pro.Record objects. These objects obtain their data model from the SQL statements that define the RelationViewPlus.
- There is a relationship between objects in the view.
  - RecordDefinition components contained by a QueryNavigator component are related in that they meet the select criteria imposed by the Filter property of the QueryNavigator.
  - Records contained by a RelationViewPlus component are related in that they all meet the select criteria in the defining SQL statement.

For detail views, the objects (RecordDefinition or RelationViewPlus' Record) are further related in that they meet the join criteria.





## **Visual Cafe window**

Main development environment window that contains the menu bar and toolbars.

W

## **Watch window**

Debugger window that displays the value of a variable or expression you enter. The values update when you pause execution or step through code. You can also examine the contents of a class member. To watch a variable accessible to a method, drag a variable from the Variables window to the Watch window. You can modify values directly in this window and continue debugging without having to stop and restart the debug session.

To see the Watch window, choose View (or Window) ► Watch.

## **window**

Area that has no borders and no menu bar.

## **workspace**

Saved window arrangement. Your workspace is saved automatically while you work.

X

Y

Z



#### Change history

3/17/97 - deleted MaxRows, Sharable, And ReadOnly per Carl T.

8/6/97 - Update/check all properties for 1.1

12/04/97 - Added properties for JDBC components



## Properties

```
{button Components,JI('vcafe.hlp','Visual_Cafe_components_and_containers')}
```

Properties are those defaults and resources which define how a visual [component](#) appears and behaves when it first displays. All visual components inherit properties defined in the Component abstract [class](#). [Containers](#) also inherit properties defined in the container abstract class. Most visual components either override inherited properties, or add unique properties to their properties list.

You can view and set properties for a component from the Property List window. At runtime, most property values can be set or modified with the `set()` and `get()` methods.

In Visual Café DDE, read-only properties are viewable for server, data source, table, and column items. To see these properties, click on a data item in the dbNAVIGATOR.

For information on a specific property

- highlight the property name in the Property List and press F1
- access the component's help topic, click on the Properties button, and select a property

## JDBC Properties



## **Alias Name property (JDBC only)**

The name to give the set of records managed by the QueryNavigator. A name is provided so that other components may bind with that data. This is done using the table name of the Data Binding property or, for RecordNumberLabel and RecordStateLable, the Data Source Alias property.

### **Runtime modification**

This property can not be changed during runtime.

## AutoStart property (JDBC only)

Determines whether this component is automatically filled from the database when its alias name is set. If `true` this component gets automatically filled, otherwise it doesn't.

You may not want this component filled if, for example, you are creating an order entry form to put records into the database, not look at the ones that are already there. (You can do this with `insert()` and `save()` without having to explicitly call `restart()`).

If this property is set to `false`, you need to start the QueryNavigator programmatically (using `restart()`) at some point if you want to retrieve rows from the database.

If a detail QueryNavigator has this property set to `false`, it will not react to scrolling of the master QueryNavigator until it is started programmatically (using `restart()`).

### Runtime modification

Use the `setAutoStart` method to modify this property.

### Settings

| <u>Valid values</u> | <u>Description</u>                                                |
|---------------------|-------------------------------------------------------------------|
| <code>true</code>   | Fill this component from the database when its alias name is set. |
| <code>false</code>  | (Default) Take no additional action when its alias name is set.   |

## Button properties (JDBC only)

These properties determine whether specific buttons will be visible. A `true` value indicates it will be visible, a `false` value indicates it will be hidden.

### Runtime modification

Change these properties before the component is made visible.

For each button use the indicated method.

| <b>Button</b> | <b>Method</b>                                   |
|---------------|-------------------------------------------------|
| Delete        | <code>setDeleteButton(boolean bVisible)</code>  |
| Goto          | <code>setGotoButton(boolean bVisible)</code>    |
| Insert        | <code>setInsertButton(boolean bVisible)</code>  |
| Restart       | <code>setRestartButton(boolean bVisible)</code> |
| Save          | <code>setSaveButton(boolean bVisible)</code>    |
| Undo          | <code>setUndoButton(boolean bVisible)</code>    |



## **Catalog property (JDBC only)**

Specifies the sub-space of the current database to use.

### **Runtime modification**

Use the `setCatalog` method to modify this property.



## **Class Name property (JDBC only)**

The class name of the object used to store the record data. Typically, this is the name of a RecordDefinition-derived class. You can create the RecordDefinition class by dragging a Data Table item from dbNAVIGATOR to a form in a project. This creates a top-level RecordDefinition object and a QueryNavigator object, which is contained by the form.

### **Runtime modification**

Use the `setClassName` method to modify this property.



## Connect Failed Listener property (JDBC only)

Defines the class of the default object that handles failed attempts to connect with the server. The class must implement the `ConnectFailedListener` interface. If a `JdbcConnection` fails to connect with the server, an instance of this class will be created and its `connectFailed` method will be called. In addition, any `ConnectFailedListener` that has been added to the listener list via the `addConnectFailedListener` method will also be called.

Typically, the listener will display a dialog prompting the user for a new server URL, user name and/or user password. If desired, the listener can then re-attempt to connect to the server.


The provided default listener displays a dialog prompting the user for a new name and password, then attempts to re-connect with the server.

### Runtime modification

Use the `setConnectFailedListener` method to modify this property.



## Data Binding property (dbAWARE/JDBC only)

The name of the database data item the component is bound with. Click the  button in the right margin to display the [Data Binding property dialog](#).

The name format is "Tablename@col1,col2%NumberOfRows".

### Runtime modification

Use the `setDataBinding` method to change this property.



## Empty Means Null property (dbAWARE/JDBC only)

Defines how a component with no value (empty) is saved in the database.

### Runtime modification


Use the `setEmptyMeansNull` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                  |
|---------------------|-----------------------------------------------------|
| true                | Save as a null value.                               |
| false               | (Default) Save as a blank value or an empty string. |



## Filter property (JDBC only)

Use this property to constrain the query. Click the  button in the right margin to display the [Filter property dialog](#). Use the dialog to enter an expression to constrain the records found during the query.

### Runtime modification

Use the `setWhereClause` method to modify this property.

## Getter Methods property (JDBC only)

Use this method to set the methods used to get a component's value. The methods, including their parameters, are in a list of strings and will be executed in sequence. For example: {"getFocus(Row,Col)","getText()"}.

### Runtime modification

Use the `setGetMethods` method to modify this property.

| Valid values | Description                           |
|--------------|---------------------------------------|
| [empty]      | The method list is empty.             |
| [list]       | The method list has a list of values. |



## **JDBC Connection Manager property (JDBC only)**

The class name of the `ConnectionManager` to use. There is only one `ConnectionManager`-derived class per project. This property is the name of that class.

### **Runtime modification**

Use the `setConnectionManagerClassName` method to modify this property.



## **JDBC Connection property (JDBC only)**

The variable name of the `JdbcConnection` to use for database access.

### **Runtime modification**

Use the `setConnectionName` method to modify this property.

## JDBC Driver Class property (JDBC only)

The class name of the JDBC driver to use. This must be a fully qualified name of a class that implements the `java.sql.Driver` interface. If no driver name is provided, the driver to use must be loaded manually before a connection is established.

By default, Symantec's JDBC driver (`symantec.itools.db.jdbc.Driver`) is used.

### Runtime modification

Use the `setDriverName()` method to modify this property. This property must be set before the connection is established (the `connect()` method is called).



## Label properties (JDBC only)

These properties determine the text displayed in specific buttons.

### Runtime modification

Change these properties before the component is made visible. Use the following methods:

| <b>Button</b> | <b>Default Label</b> | <b>Method</b>                                |
|---------------|----------------------|----------------------------------------------|
| Delete        | "Delete"             | <code>setDeleteString(String label)</code>   |
| Execute       | "Execute"            | <code>setExecuteString(String label)</code>  |
| First         | "Next"               | <code>setFirstString(String label)</code>    |
| Goto          | "Goto"               | <code>setGotoString(String label)</code>     |
| Insert        | "Insert"             | <code>setInsertString(String label)</code>   |
| Next          | "next"               | <code>setNextString(String label)</code>     |
| Previous      | "Previous"           | <code>setPreviousString(String label)</code> |
| Re-Start      | "Re-Start"           | <code>setReStartString(String label)</code>  |
| Save          | "Save"               | <code>setSaveString(String label)</code>     |
| Start         | "Start"              | <code>setStartString(String label)</code>    |
| Undo          | "Undo"               | <code>setUndoString(String label)</code>     |



## **Output property (JDBC only)**

The component that the mediator will use to display the data.

### **Runtime modification**

Use the `setOutput` method to modify this property.



## Read Only property (JDBC only)

Specifies the connection can only read from the database, not write. This information is sent to the database so that it may optimize its actions.

### Runtime modification

Use the `setReadOnly()` method to modify this property. This property cannot be changed in the middle of a transaction.

### Settings

| Valid values | Description                                                         |
|--------------|---------------------------------------------------------------------|
| true         | Transactions through this connection will not modify the database.  |
| false        | (Default) This connection's transactions might modify the database. |

## Setter Methods property (JDBC only)

Use this method to set the methods used to set a component's value. The methods, including their parameters, are in a list of strings and will be executed in sequence. For example: { "setText(Value,Row,Col)"}


### Runtime modification

Use the `setSetMethods` method to modify this property.

| <b>Valid values</b> | <b>Description</b>                    |
|---------------------|---------------------------------------|
| [empty]             | The method list is empty.             |
| [list]              | The method list has a list of values. |



## Sort Order property (JDBC only)

A list of column names that specifies the order in which to sort the records. Click the  button in the right margin to display the [Sort Order property dialog](#).


### Runtime modification

Use the `setSortOrder` method and the `addSortOrderItem` method to modify this property.

| Valid values | Description                               |
|--------------|-------------------------------------------|
| [empty]      | The sort order list is empty.             |
| [list]       | The sort order list has a list of values. |



## Table Name property (JDBC only)

The name of the database table and columns to use. Click the  button in the right margin to display the [Columns property dialog](#).

### Runtime modification

Use the `setTableName()` method to modify this property.

## dbAware Properties

## Auto Disconnect property (dbAWARE only)

Use this method to control whether to disconnect from the database when a MultiView is closed.

This property is intended for advanced users who are experiencing slow connections to their databases. This is not a necessary property of ConnectionInfo.

For more information on the MultiView class, see [RelationView component](#) and the dbANYWHERE API online HTML reference manual.

### Runtime modification

This property can not be changed during runtime.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                                                                                                                                                                                                            |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| true                | (Default) Any RelationView that was created using the associated ConnectionInfo component is automatically disconnected from the database when the MultiView is closed. This occurs automatically when the request/transaction is finished or no longer used. |
| false               | The database connection is not closed when the MultiView is closed. The connection is closed when the user disconnects from the database, or when the applet terminates.                                                                                      |





## Auto Expand property (dbAWARE only)

Determines whether new values entered into the ComboBox are added to its list.

### Runtime modification

Use the `setAutoExpand` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                           |
|---------------------|--------------------------------------------------------------|
| true                | Automatically adds entered items to this ComboBox's list.    |
| false               | (Default) Does not add entered items to the ComboBox's list. |

## Binding property (dbAWARE only)

Defines how the component is bound to the database column and provides built-in data management functionality. The set of subproperties that display for the Binding property in the Property List depends on the component type.

### Runtime modification

These properties should not be changed during runtime.

---

### RelView Name

The name of the [RelationViewPlus component](#) that the component is bound to.

### Projection Name

The name of the database column that the component is bound to.

**Note:** You can also use the column number instead on the column name. The column number is the position of the projection in the RelationView.

### Dynamic Update

Defines when update data is sent to the MultiView. Values in the MultiView are sent to the database when the RelationView save method is invoked. (For information on MultiView, see the dbANYWHERE API HTML online documentation.)

| Valid values | Description |
|--------------|-------------|
|--------------|-------------|

|       |                                                                              |
|-------|------------------------------------------------------------------------------|
| true  | Each keystroke is sent to the MultiView for processing.                      |
| false | (Default) The value is sent to the MultiView when the component loses focus. |

### Treat Blank As

Defines how a component with no value (empty) is saved in the database.

| Valid values | Description |
|--------------|-------------|
|--------------|-------------|

|         |                                                  |
|---------|--------------------------------------------------|
| Null    | Save as a null value.                            |
| Blank   | Save as a blank value or an empty string.        |
| Default | (Default) Save as defined by its original state. |

### Buttons

On Grid components, the following buttons are displayable.

| Button   | Description                                                                                | Default Value |
|----------|--------------------------------------------------------------------------------------------|---------------|
| Insert   | Add a new record above the current record.                                                 | False         |
| Goto     | Go to the specified record number.                                                         | False         |
| Undo     | Undo the last change in the current record.                                                | True          |
| Restart  | Restart the application or applet. All changes made since the last save or start are lost. | False         |
| Delete   | Delete the selected record.                                                                | True          |
| Undelete | Undo the last delete in the session.                                                       | True          |
| Save     | Save all data in the current session.                                                      | False         |

## ConnectionInfo property (dbAWARE only)

Specifies the name of the ConnectionInfo component that the RelationView or List is based on.

### Runtime modification

This property can not be changed during runtime.

Also see [Lookup property \(dbAWARE property\)](#)



## **Data Source Alias property (dbAWARE only)**

The alias name of the QueryNavigator component to monitor.

### **Runtime modification**

Use the `setDataSource` method to modify this property.



## **Data Source Name property (dbAWARE only)**

Defines the data source that the ConnectionInfo component is based on.

The data source can be either an ODBC 32 data source, which is defined in the appropriate Windows/NT registry, or a dbANYWHERE native driver data source, which is defined in the dbawdsn.ini file.

### **Runtime modification**

This property can not be changed during runtime.

### **Settings**

The name of any data source that is associated with the RelationView's Session component.



## **False String property (dbAWARE only)**

Defines a database value to associate with a component when the component's value is boolean False.

See [Checkbox component](#) and [True String](#) .



## **Item Count property (dbAWARE only)**

This is the current number of items in the list.

### **Settings**

Read-only.

## Join property (dbAWARE only)

Defines a master/detail relationship, which is a the relationship between a detail view (the current RelationView or QueryNavigator) and its master view (parent).

### Runtime modification

These properties should not be changed during runtime.

---

### Master Alias Name (JDBC)

This property specifies the master QueryNavigator that this detail QueryNavigator is based on.

### Parent RelationView (dbANYWHERE)

This property is enabled only when the RelationView is a detail view. Specifies the parent RelationView that this child RelationView is based on.

### Join Columns

Use this property to define a master/detail relationship. Click the ► button in the right margin to display the Join Definition dialog.

### Cardinality (dbANYWHERE)

This property is enabled only when the RelationView is a detail view. Specifies the relationship between a record in one database table and a record in another database table. Visual Café DDE uses this setting to determine processing priorities and the order of the committing statement within a transaction(s).

| <b>Valid values</b> | <b>Description</b>                                                                                                    |
|---------------------|-----------------------------------------------------------------------------------------------------------------------|
| One to One          | A record in the first database table is related to only one record in the second database table.                      |
| One to Many         | (Default) A record in the first database table is related to none, one, or more records in the second database table. |
| Many to One         | many records in the first database table are related to one record in the second database table.                      |
| Many to Many        | Many records in the first database table are related to many records in the second database table.                    |

### Initial Record Position (dbANYWHERE)

Defines the state of the records when they display.

| <b>Valid values</b> | <b>Description</b>                                                                                                                   |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| First               | (Default) The first record selected is displayed for editing. If there are no records in the table, the RelationView is initialized. |
| New                 | A blank record displays for data adding (Add mode)                                                                                   |



## Lookup property (dbAWARE only)

Defines how a component is populated. There are three types of lists that can be used in component population:

- hard coded
- unjoined related lookup (static values)
- joined related lookup (dynamic values)

Unjoined and joined related lookups also have a hard coded portion of the list.

**Note:** For List components, the Binding property is used differently than the Lookup property binding. This is similar to TextField components. A list does not have to be bound to a database column.

### Runtime modification

These properties should not be changed during runtime.

---

### ConnectionInfo

The name of the ConnectionInfo object that this component is based on. See [ConnectionInfo property](#)

### Select Clause

Use this property for joined and unjoined related list lookups.

The SQL statement for populating the component. See [Select Clause property](#).

### Lookup RelView Name

Use this property for joined and unjoined related list lookups.

The name of the RelationView that the lookup should be performed on. If you are using a joined lookup, the use the name of the lookup RelationView. If you are using an unjoined lookup, then use the name of the RelationView to which the list is bound.

### Join Columns

Use this property for joined related list lookups ONLY.

Defines the criteria for joining columns in a lookup for component population. This property's setting automatically updates the Select Clause property by adding a WHERE clause. In the generated WHERE clause, the question mark (?) is a place holder for a value in the master view.

The SQL WHERE clause of the Select property must be properly formatted with join conditions using "?" for parameter value substitution.


A RelationView name must be provided in order to create the joined lookup. The join columns define how the parent lookup RelationView and the SQL SELECT clause are related and joined.

The value that displays in the field identifies the current state of data in the component.

| Valid values | Description                                   |
|--------------|-----------------------------------------------|
| [empty]      | There is no data currently in the component.  |
| [list]       | The component currently has a list of values. |



## Lookup Name property (dbAWARE only)

The Lookup Name property is the name of a data source table and column. Use the this property to fill the component's list with an entire column of values. Click the  button in the right margin to display the [Lookup Name property dialog](#).

### Runtime modification

Use the `setLookupName` method to modify this property.

## Optimistic Concurrency property (dbAWARE only)

Specifies how to update the database when more than one client is accessing it. Optimistic concurrency allows multi-user access to data while maintaining data integrity and preventing update losses.

Optimistic Concurrency controls the SQL that is sent out in an update operation. It determines the fields that should be used in the WHERE SQL clause generated by Visual Café DDE.

All settings ensure that only one row is changed. The only difference between the settings is how the SQL WHERE clause is generated. If the WHERE clause does not uniquely identify the row and multiple rows are updated, a rollback occurs.

**Important** If the record key is made up of multiple columns, you must include all of the record key elements on the form to ensure unique key generation.

### Settings

| Valid values        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| All                 | (Default) The SQL WHERE clause includes all fields. All column values at the time that the record is read are compared with the current column values before the new field values are inserted into the columns.                                                                                                                                                                                                                                                                                            |
| Unique              | The SQL WHERE clause includes <u>ONLY</u> unique columns, that best identify a row, that are included on the form and bound to a column. The unique column(s) are determined by checking the database metadata in this order: JDBC calls, <code>getBestRowIdentifier</code> , <code>getPrimaryKeys</code> , <code>getIndexInfo</code> .<br>The value of the bound unique column(s) when the record was read are compared with the current values before the new field values are inserted into the columns. |
| Unique and modified | Same as Unique, except the SQL WHERE clause includes bound unique columns as well as all modified columns.                                                                                                                                                                                                                                                                                                                                                                                                  |

### Notes

The Unique and Unique/modified settings can only be observed and enforced if the unique columns are projected on the form. If you don't want to display the unique columns, hide the text fields.

You must include enough columns in the SQL SELECT clause to uniquely identify the row to be able to modify data. If there is no way to uniquely identify the row, all non-blob columns are used. If duplicate rows exist, data will not be changed and a rollback occurs.

LongVarChar and LongVarBinary (blob) columns are never included in SQL WHERE clauses regardless of the setting.

## ▶ **Select Clause property (dbAWARE only)**

The actual SQL statement that is used to query the database and initialize the RelationView or List. If the SQL string is not in the standard format, the database dialogs and wizards cannot parse the information; you must edit the string manually.

The standard format is:

```
SELECT X1, X2, X3, ... from Y
```

where X is a series of database columns separated by commas and Y is the name of the database table.

To specify a custom query, click in the Select Statement field and then click on the ▶ button at the field right to display the SQL Statement editor. The editor lets you change a RelationView's Select Statement property.

**Note:** Additional optional SQL clauses can be added to the end of a standard formatted SQL string, for example, ORDER BY, HAVING, LIKE, WHERE, etc.

Use a WHERE clause to provide criteria that each row in the table must meet in order to be returned in the result set.

Use an ORDER BY clause to sort the retrieved records, if needed. By default, records retrieved from a query display in the order that they appear in the table.

Also see [Lookup property \(dbAWARE property\)](#)

**Tip:** When you create a RelationView with a Visual Café DDE wizard, this SQL statement is generated for you.



## **Selected Item property**

This is the currently selected item in the list.

### **Runtime modification**

Use the `getData` method to access this property.

### **Settings**

Read-only.



## **Selected Items property**

This is a list of the currently selected items in the list.

### **Runtime modification**

Use the `getSelectedObjects` method to access this property.

### **Settings**

Read-only.



### **Session property (dbAWARE only)**

Specifies the name of the Session object that the RelationView is based on.

## Toolbar Background property (dbAWARE only)

Sets the background color of the Grid's Toolbar.

To set a custom color, choose Custom from the drop-down in the Property List window and choose a color from the color palette.

### Runtime modification

Use the `setToolbarBackground` method to change the color at run time.

### Settings

| <b>Valid values</b> | <b>Description</b>                                 |
|---------------------|----------------------------------------------------|
| black               | Makes the toolbar background black.                |
| blue                | Makes the toolbar background blue.                 |
| cyan                | Makes the toolbar background cyan.                 |
| darkGray            | Makes the toolbar background dark gray.            |
| gray                | Makes the toolbar background gray.                 |
| green               | Makes the toolbar background green.                |
| lightGray           | (Default) Makes the toolbar background light gray. |
| magenta             | Makes the toolbar background magenta.              |
| orange              | Makes the toolbar background orange.               |
| pink                | Makes the toolbar background pink.                 |
| red                 | Makes the toolbar background red.                  |
| white               | Makes the toolbar background white.                |
| yellow              | Makes the toolbar background yellow.               |





## Triggering Event property (dbAWARE only)

Specifies which type of event forces the component to commit its value to the database.

For additional information, see [Events Triggering Database Updates](#).

### Runtime modification

At run time, use the `setTriggeringEvent` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                  |
|---------------------|---------------------------------------------------------------------|
| Action_Event        | A commit occurs when the user pressed ENTER while in the TextField. |
| Focus_Event         | A commit occurs when the component loses input focus.               |
| Item_Event          | A commit occurs when an item state changes.                         |
| Key_Event           | A commit occurs when a key is released.                             |
| Text_Event          | A commit occurs when the text value changes.                        |



## **True String property (dbAWARE only)**

Defines a database value to associate with a component when the component's value is boolean True.

See [Checkbox component](#) and [False String property \(dbAWARE property\)](#)



## **Tstamp property (dbAWARE only)**

The current date/time value formatted as requested by the Format on Display property.

### **Runtime modification**

Use the `getTStamp` method to access this property.

### **Settings**

Read-only.



## **User Name property (dbAWARE only)**

The database user name for the data source defined in the Data Source Name property.

The user name string is case sensitive, if the database is case sensitive.

**Note:** Do not specify a user name and/or password if you wish the applet user to be forced to login to the database each time the applet is run.



## **User Password property (dbAWARE only)**

The database password to the data source defined in the Data Source Name property

As the user types in a password string, the characters appear as clear text, unmasked, and visible. The password string also appears in clear text in your source code.

The password is case sensitive, if the database is case sensitive.

Also see, [User Name property](#)



## **Visible Index property (dbAWARE only)**

The index last made visible by the `makeVisible` method.

### **Runtime modification**

Use the `getVisibleIndex` method to access this property.

### **Settings**

Read-only.

## General Properties



## Action Command property

The command name of the action event fired by this component.

### Runtime modification

Use the `setActionCommand` method to modify this property.

### Settings

Any string is valid. The default for the Button component is "button".



## Active Tab property

The zero-relative index of the subpanel and tab to show.

### Runtime modification

Use the `setCurrentPanelNdx` method to modify this property.

### Settings

| <b>Valid Values</b> | <b>Description</b>                                       |
|---------------------|----------------------------------------------------------|
| -1                  | (Default)                                                |
| integer             | The zero-relative index of the subpanel and tab to show. |



## Alignment property

Positioning property. Controls the justification of text drawn in a Label component, and positions components within a container using the FlowLayout manager.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                         |
|---------------------|----------------------------------------------------------------------------|
| CENTER              | (Default for Containers) The text/component should be centered.            |
| LEFT                | (Default for Labels) The text/component should be placed towards the left. |
| RIGHT               | The text/component should be placed towards the right.                     |



## Alignment Style property

Specifies the justification of text drawn in a component.

### Runtime modification

At run time, use the `setAlignStyle` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                            |
|---------------------|---------------------------------------------------------------|
| ALIGN_CENTERED      | Center text within the component.                             |
| ALIGN_LEFT          | (Default) Justify the text to the left edge of the component. |
| ALIGN_RIGHT         | Justify the text to the right edge of the component.          |



## Allow Dynamic Moving property

Determines whether the moving of a split in a splitter panel will be in real time, or delayed until mouse released.

### Runtime modification

At run time, use the `setAllowDynamicMoving` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                                   |
|---------------------|--------------------------------------------------------------------------------------|
| true                | When a split is moved it will dynamically resize the panels the split affects.       |
| false               | (Default) When a split is moved the resizing will happen when the mouse is released. |



## Allow Sorting property

Determines whether the MultiList is sorted when a column heading is clicked.

### Settings

| <b>Valid values</b> | <b>Description</b>                                          |
|---------------------|-------------------------------------------------------------|
| true                | (Default) Clicking on a column heading sorts the MultiList. |
| false               | Clicking on a column heading does not sort the MultiList.   |

## Anchor property

This property is a subproperty of [Grid Bag Constraints](#) . It is only accessible when the component is inside a container that uses a GridBagLayout layout. To access this property, set the component's parent container's [Layout property](#) to GridBagLayout.

Determines where to place the component within a component's display area The system invokes this property when a component is smaller than its display area.

### Runtime modification

At run time, use the `setConstraints` method to modify this property.

### Settings

| Constant  | Value | Description                                                                    |
|-----------|-------|--------------------------------------------------------------------------------|
| CENTER    | 10    | Puts the component in the center of its display area.                          |
| EAST      | 13    | Puts the component on the right side of its display area, centered vertically. |
| NORTH     | 11    | Puts the component in the top of its display area, centered horizontally       |
| NORTHEAST | 12    | Puts the component in the top right corner of its display area.                |
| NORTHWEST | 18    | Puts the component in the top left corner of its display area.                 |
| SOUTH     | 15    | Puts the component in the bottom of its display area, centered horizontally    |
| SOUTHEAST | 14    | Puts the component in the bottom right corner of its display area.             |
| SOUTHWEST | 16    | Puts the component in the bottom left corner of its display area.              |
| WEST      | 17    | Puts the component on the left side of its display area, centered vertically.  |

## ▶ Arrow Color property

Sets the color of the DirectionButton's arrow.

To set a custom color, choose Custom from the drop-down in the Property List window and choose a color from the color palette.

### Runtime modification

Use the `setArrowColor` method to change the arrow color at run time.

### Settings

| Valid values | Description                               |
|--------------|-------------------------------------------|
| black        | (Default) Makes the component text black. |
| blue         | Makes the component text blue.            |
| cyan         | Makes the component text cyan.            |
| darkGray     | Makes the component text dark gray.       |
| gray         | Makes the component text gray.            |
| green        | Makes the component text green.           |
| lightGray    | Makes the component text light gray.      |
| magenta      | Makes the component text magenta.         |
| orange       | Makes the component text orange.          |
| pink         | Makes the component text pink.            |
| red          | Makes the component text red.             |
| white        | Makes the component text white.           |
| yellow       | Makes the component text yellow.          |



## Arrow Indent property

Determines the amount of blank space between the arrow and the [DirectionButton](#) border. This margin around the arrow is specified in pixels.

Sets the amount of blank space between the arrow and the button border in pixels.

### Settings

Any non-negative integer. This integer specifies the margin, in pixels, around the arrow. The default value is zero (0), in which case the arrow takes up the entire button area.





## Auto Start property

Determines whether the StatusScroller's message will automatically start scrolling when the applet is loaded.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                          |
|---------------------|-----------------------------------------------------------------------------|
| true                | (Default) The scrolling will automatically start when the applet is loaded. |
| false               | The scrolling will not automatically start when the applet is loaded.       |

## Background property

Sets the color displayed for the background of a component. This color is only used when the Inherit Background property is false. Choosing a background color automatically sets that property to false.

To set a custom color, choose Custom from the drop-down in the Property List window and choose a color from the color palette.

All visual components and containers use the Background property.

### Runtime modification

At run time you can change background or foreground colors using the component's `setBackground` or `setForeground` method.

### Settings

| Valid values | Description                               |
|--------------|-------------------------------------------|
| black        | Makes the component text black.           |
| blue         | Makes the component text blue.            |
| cyan         | Makes the component text cyan.            |
| darkGray     | Makes the component text dark gray.       |
| gray         | Makes the component text gray.            |
| green        | Makes the component text green.           |
| lightGray    | Makes the component text light gray.      |
| magenta      | Makes the component text magenta.         |
| orange       | Makes the component text orange.          |
| pink         | Makes the component text pink.            |
| red          | Makes the component text red.             |
| white        | (Default) Makes the component text white. |
| yellow       | Makes the component text yellow.          |



## **Bevel Height property**

Sets the height of the shadow on any component that derives from Border Panel.

## Bevel Style property

Sets the border bevel style for the component.

### Runtime modification

At run time, use the `setBevelStyle` method to modify this property.

### Settings

| Valid values  | Description                                                                                                                                                                                  |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BEVEL_LINE    | (Default) Uses a single line border. This provides a "flat" appearance. Flat appearance should be used for a scrollable region or control, such as a drop-down list and drop-down combo box. |
| BEVEL_LOWERED | 3D effect. Makes the component appear lower than the surrounding area. This field style is standard for text boxes, check boxes, spin boxes, and list boxes.                                 |
| BEVEL_NONE    | No border is used.                                                                                                                                                                           |
| BEVEL_RAISED  | 3D effect. Makes the component appear higher than the surrounding area. This window style is used for primary and secondary windows.                                                         |



## Block Increment property

Determines the large increment of a scroll bar. This is the amount that is added to or subtracted from the component's Value property setting when the user clicks the area between the scroll thumb and scroll arrow.

### Runtime modification

Use the `setBlockIncrement` method to modify this property.

### Settings

| Valid Values | Description                         |
|--------------|-------------------------------------|
| 10           | (Default)                           |
| 0-32767      | Valid values are within this range. |

## Border Color property

Specifies the color for a border around the component.

To set a custom color, choose Custom from the drop-down in the Property List window and choose a color from the color palette.

### Settings

| <b>Valid values</b> | <b>Description</b>                |
|---------------------|-----------------------------------|
| black               | (Default) Makes the border black. |
| blue                | Makes the border blue.            |
| cyan                | Makes the border cyan.            |
| darkGray            | Makes the border dark gray.       |
| gray                | Makes the border gray.            |
| green               | Makes the border green.           |
| lightGray           | Makes the border light gray.      |
| magenta             | Makes the border magenta.         |
| orange              | Makes the border orange.          |
| pink                | Makes the border pink.            |
| red                 | Makes the border red.             |
| white               | Makes the border white.           |
| yellow              | Makes the border yellow.          |



## Border Indent property

Property indicating the drawing margin, in pixels, around the outside of a BEVEL\_LINE border.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                                         |
|---------------------|--------------------------------------------------------------------------------------------|
| INDENT_ZERO         | (Default) Specifies a drawing margin of 0 pixels around the outside of a BEVEL_LINE border |
| INDENT_ONE          | Specifies a drawing margin of 1 pixel around the outside of a BEVEL_LINE border.           |
| INDENT_TWO          | Specifies a drawing margin of 2 pixels around the outside of a BEVEL_LINE border.          |

## Border Style property

Specifies the setting or suppressing of the component's border.

### Runtime modification

At run time, use the `setBevelStyle` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                                                                                                                                           |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BEVEL_LINE          | (Default) Uses a single line border. This provides a "flat" appearance. Flat appearance should be used for a scrollable region or control, such as a drop-down list and drop-down combo box. |
| BEVEL_LOWERED       | 3D effect. Makes the component appear lower than the surrounding area. This field style is standard for text boxes, check boxes, spin boxes, and list boxes.                                 |
| BEVEL_NONE          | No border is used.                                                                                                                                                                           |
| BEVEL_RAISED        | 3D effect. Makes the component appear higher than the surrounding area. This window style is used for primary and secondary windows.                                                         |





## Border Style property (ImageListBox)

Specifies the setting or suppressing of the ImageListBox's component's border.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                                                                   |
|---------------------|----------------------------------------------------------------------------------------------------------------------|
| BORDER_REGULAR      | (Default) The component displays with a lowered border, making the component appear lower than the surrounding area. |
| BORDER_NONE         | The component displays with no border.                                                                               |

## Border Color property

Specifies the color for a component's border.

To set a custom color, choose Custom from the drop-down in the Property List window and choose a color from the color palette.

### Settings

| <b>Valid values</b> | <b>Description</b>                |
|---------------------|-----------------------------------|
| black               | (Default) Makes the border black. |
| blue                | Makes the border blue.            |
| cyan                | Makes the border cyan.            |
| darkGray            | Makes the border dark gray.       |
| gray                | Makes the border gray.            |
| green               | Makes the border green.           |
| lightGray           | Makes the border light gray.      |
| magenta             | Makes the border magenta.         |
| orange              | Makes the border orange.          |
| pink                | Makes the border pink.            |
| red                 | Makes the border red.             |
| white               | Makes the border white.           |
| yellow              | Makes the border yellow.          |

## Bounds properties

Sets the position and size of a component, in pixels. All visual components and containers support the Bounds properties.

### Runtime modification

Change the dimensions of a component by calling the `setBounds` method.

---

#### X Property

Sets the distance between the left edge of a component and the left edge of its container.

| Valid values | Description                                    |
|--------------|------------------------------------------------|
| 0            | (Default) The left-most edge of the container. |

#### Y Property

Sets the distance between the top of a component and the top of its container.

| Valid values | Description                                   |
|--------------|-----------------------------------------------|
| 0            | (Default) The top-most edge of the container. |

#### Width Property

Sets the distance of a component's right edge from its left edge.

| Valid values | Description               |
|--------------|---------------------------|
|              | The default value varies. |

#### Height Property

Sets the distance of a component's bottom edge from its top edge.

| Valid values | Description               |
|--------------|---------------------------|
|              | The default value varies. |



## Box Width property

If the Draw as Boxes property is true, Box Width specifies the width, in pixels, of the discrete boxes that make up the indicator of a ProgressBar component. If the Draw as Boxes property is false, the Box Width property is ignored.

### Settings

| Valid values | Description                        |
|--------------|------------------------------------|
| 8            | (Default) A box width of 8 pixels. |
| 1-32767      | The desired box width in pixels.   |



## Button Color property

Specifies the color of the button part of the component.

To set a custom color, choose Custom from the drop-down in the Property List window and choose a color from the color palette.

### Settings

| <b>Valid values</b> | <b>Description</b>                     |
|---------------------|----------------------------------------|
| black               | Makes the border black.                |
| blue                | Makes the border blue.                 |
| cyan                | Makes the border cyan.                 |
| darkGray            | Makes the border dark gray.            |
| gray                | Makes the border gray.                 |
| green               | Makes the border green.                |
| lightGray           | (Default) Makes the border light gray. |
| magenta             | Makes the border magenta.              |
| orange              | Makes the border orange.               |
| pink                | Makes the border pink.                 |
| red                 | Makes the border red.                  |
| white               | Makes the border white.                |
| yellow              | Makes the border yellow.               |



## Buttons Alignment property

Specifies how the Wizard's button will be aligned.

### Runtime modification

Use the `setButtonsAlignment` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                              |
|---------------------|-------------------------------------------------|
| LEFT                | Aligns the buttons towards the left.            |
| CENTER              | Centers the buttons.                            |
| RIGHT               | (Default) Aligns the buttons towards the right. |



## Case-sensitive property

Sets whether searches within a component are case sensitive.

### Settings

| <b>Valid values</b> | <b>Description</b>                         |
|---------------------|--------------------------------------------|
| false               | (Default) Searches are not case sensitive. |
| true                | Searches are case sensitive.               |

## Cell Background property

Defines the color to use for the background of all cells in the MultiList component.

To set a custom color, choose Custom from the drop-down in the Property List window and choose a color from the color palette.

### Settings

| <b>Valid values</b> | <b>Description</b>                         |
|---------------------|--------------------------------------------|
| black               | Makes the cell background black.           |
| blue                | Makes the cell background blue.            |
| cyan                | Makes the cell background cyan.            |
| darkGray            | Makes the cell background dark gray.       |
| gray                | Makes the cell background gray.            |
| green               | Makes the cell background green.           |
| lightGray           | Makes the cell background light gray.      |
| magenta             | Makes the cell background magenta.         |
| orange              | Makes the cell background orange.          |
| pink                | Makes the cell background pink.            |
| red                 | Makes the cell background red.             |
| white               | (Default) Makes the cell background white. |
| yellow              | Makes the cell background yellow.          |





## Cell Font property

Defines the font used to display text within all cells in the MultiList component. In the property field, click on the ► button (or double-click in the field) to display the font dialog box. Select the font combination that you want.

### Runtime modification

At run time, use the `setCellFont` method to modify this property.

### Settings

The default value is

```
"SansSerif", java.awt.Font.PLAIN, 12
```

## Cell Foreground property

Defines the color to use for all cell text in the MultiList component.

To set a custom color, choose Custom from the drop-down in the Property List window and choose a color from the color palette.

### Settings

| <b>Valid values</b> | <b>Description</b>                         |
|---------------------|--------------------------------------------|
| black               | (Default) Makes the cell foreground black. |
| blue                | Makes the cell foreground blue.            |
| cyan                | Makes the cell foreground cyan.            |
| darkGray            | Makes the cell foreground dark gray.       |
| gray                | Makes the cell foreground gray.            |
| green               | Makes the cell foreground green.           |
| lightGray           | Makes the cell foreground light gray.      |
| magenta             | Makes the cell foreground magenta.         |
| orange              | Makes the cell foreground orange.          |
| pink                | Makes the cell foreground pink.            |
| red                 | Makes the cell foreground red.             |
| white               | Makes the cell foreground white.           |
| yellow              | Makes the cell foreground yellow.          |



## Center Mode property

Determines where within the component area to draw the image.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                   |
|---------------------|----------------------------------------------------------------------|
| true                | (Default) Center the image.                                          |
| false               | Image is left-justified and top justified within the component area. |



## Checkbox property

Determines whether a menu item behaves like a check box. A Checkbox toggles between true and false when selected.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                                                                                                      |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| true                | (Default) The menu behaves like a check box. When selected, the state of the checkbox toggles from checked to unchecked, and from unchecked to checked. |
| false               | The menu item does not behave like a check box.                                                                                                         |



## Class property

The fully qualified name of the Java [package](#) and [class](#) defining the current [component](#). All visual components and [containers](#) use this property.

### Settings

Read-only.



## **Clear Frame property**

Determines whether the previous image is cleared before displaying the current image. If this property is set to true, the end user may see a flicker as the image changes.

## Column Alignments property

A list of strings that specifies how the text in each column of a MultiList is justified. The columns are listed from left to right.

To create an list item, type the item value within the list box. To create a new list item, press CTRL-ENTER and type the next item value. (The Macintosh version provides a button.)

### Runtime modification

At run time, use the `setColumnAlignment` or `setColumnAlignments` methods to modify this property.

### Settings

| Valid values | Description                                                     |
|--------------|-----------------------------------------------------------------|
| [empty]      | The component does not have a list of values for this property. |
| [list]       | The component has a list of values for this property.           |

| Valid list values | Description                               |
|-------------------|-------------------------------------------|
| Left              | Align the text to the left of the cell.   |
| Center            | Align the text in the center of the cell. |
| Right             | Align the text to the right of the cell.  |

## Column Headings property

A list of strings that specifies a text heading for each column. List the columns from left to right. The headings are clipped if necessary.

To create an list item, type the item value within the list box. To create a new list item, press CTRL-ENTER and type the next item value. (The Macintosh version provides a button.)

### Runtime modification

At run time, use the `setHeading` or `setHeadings` methods to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                              |
|---------------------|-----------------------------------------------------------------|
| [empty]             | The component does not have a list of values for this property. |
| [list]              | The component has a list of values for this property.           |



## Column Sizes property

A list of strings that specifies the width of each column in pixels. List the columns from left to right.

To create an list item, type the item value within the list box. To create a new list item, press CTRL-ENTER and type the next item value. (The Macintosh version provides a button.)

### Runtime modification

At run time, use the `setColumnSizes` method to modify this property.

### Settings

| Valid values | Description                                                     |
|--------------|-----------------------------------------------------------------|
| [empty]      | The component does not have a list of values for this property. |
| [list]       | The component has a list of values for this property.           |

## Columns property

Specifies the number of columns in a text component. Each column holds a single character. When both the row and column values are greater than zero, the `getMinimumSize` method returns a size appropriate for the desired number of rows and columns.

### Settings

| <b>Valid values</b> | <b>Description</b>                                           |
|---------------------|--------------------------------------------------------------|
| 0                   | (Default) Don't use when determining minimum component size. |
| 1-32767             | The desired number of columns to display.                    |

## Columns to Display property

Sets the number of character columns to display in a list. This affects the dimensions returned by the `getPreferredSize` method and determines the number of columns displayed when this component is automatically laid out.

### Runtime modification

Use the `setColumns` method to modify this property.

### Settings

| Valid values | Description                                                  |
|--------------|--------------------------------------------------------------|
| 0            | (Default) Don't use when determining minimum component size. |
| 1-32767      | The desired number of character columns to display.          |



## Combined Button property

Determines whether to combine the Next and the Finish buttons into a single button.

### Runtime modification

Use the `setCombinedButton` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                  |
|---------------------|-----------------------------------------------------|
| true                | The Next and Finish buttons are combined into one.  |
| false               | (Default) The Next and Finish buttons are separate. |

## ComboBox Mode property

This property determines the highlight action of the ImageListBox. When ComboBox Mode is true list selections will be highlighted anytime the mouse cursor is over them, even when the mouse button is not down. When false, the mouse needs to be pressed to select an item.

This property only applies when the ImageListBox is not allowing multiple selections.

### Runtime modification

At run time, use the `setComboBoxMode` method to modify this property.

### Settings

| <u>Valid values</u> | <u>Description</u>                                                                  |
|---------------------|-------------------------------------------------------------------------------------|
| true                | Items are selected and highlighted when the mouse cursor is over them.              |
| false               | (Default) Items are selected and highlighted only when the mouse button is pressed. |

## Cursor property

The cursor to use while the mouse is over this component.

### Runtime modification

Use the `setCursor` method to modify this property.

### Settings

| Valid values     | Description                   |
|------------------|-------------------------------|
| CROSSHAIR_CURSOR | A crosshair cursor.           |
| DEFAULT_CURSOR   | (Default) The default cursor. |
| E_RESIZE_CURSOR  | An east-resize cursor.        |
| HAND_CURSOR      | A hand cursor.                |
| MOVE_CURSOR      | A move cursor.                |
| N_RESIZE_CURSOR  | A north-resize cursor.        |
| NE_RESIZE_CURSOR | A north-east-resize cursor.   |
| NW_RESIZE_CURSOR | A north-west-resize cursor.   |
| S_RESIZE_CURSOR  | A south-resize cursor.        |
| SE_RESIZE_CURSOR | A south-east-resize cursor.   |
| SW_RESIZE_CURSOR | A south-west-resize cursor.   |
| TEXT_CURSOR      | A text cursor.                |
| W_RESIZE_CURSOR  | A west-resize cursor.         |
| WAIT_CURSOR      | A wait cursor.                |



## **Date property**

Specifies the starting date for the Calendar component. Most standard date syntaxes are recognized, including the IETF standard date syntax: "Mon, 17 Jul 1997 14:45:00 GMT", and also "7/17/97".

### **Runtime modification**

At run time, use the `setDate` method to modify this property.

### **Settings**

A string representing the desired date.



## **Default Directory property**

Sets the initial file directory that a file dialog box opens to.

### **Runtime modification**

At run time, use the `setDirectory` method to modify this property.

### **Settings**

Any valid operating system directory.





## **Default File Name property**

Sets the default file name that a file dialog box opens with.

### **Runtime modification**

At run time, use the `setFile` method to modify this property.

### **Settings**

Any valid operating system file name.

## Delay property

The delay, in milliseconds, between animation frames (for Animator and MovingAnimation) or message scroll steps (for StatusScroller).

### Runtime modification

At run time, use the `setDelay` method to modify this property.

### Settings

| Valid Values | Description                                |
|--------------|--------------------------------------------|
| 100          | (Default for StatusScroller)               |
| 500          | (Default for Animator and MovingAnimation) |
| integer      | The delay in milliseconds.                 |



## Direction property

Use this property to define the direction in which the [DirectionButton component](#) arrow points.

### Runtime modification

At run time, use the `setDate` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                               |
|---------------------|--------------------------------------------------|
| TOP                 | Arrow points up.                                 |
| RIGHT               | Arrow points to the right edge of the container. |
| BOTTOM              | Arrow points down.                               |
| LEFT                | Arrow points to the left edge of the container.  |



## Display Cell Borders property

Toggles the display of cell borders within the ImageListBox component.

### Runtime modification

At run time, use the `setCellBorders` method to modify this property.

### Settings

| Valid values | Description                            |
|--------------|----------------------------------------|
| true         | Cell borders display.                  |
| false        | (Default) Cell borders do not display. |



## Draw as Boxes property

Used by the ProgressBar component to determine how to draw the progress indicator. The indicator may be drawn as a single solid box, or as a series of discrete boxes.

### Settings

| <b>Valid values</b> | <b>Description</b>                                         |
|---------------------|------------------------------------------------------------|
| true                | Progress indicator is drawn as a series of discrete boxes. |
| false               | (Default) Progress indicator is drawn as a single box.     |



## Dynamic Resizing property

Allows resizing of the edit field, if needed, when new values are entered.

### Settings

| <b>Valid values</b> | <b>Description</b>                        |
|---------------------|-------------------------------------------|
| true                | The edit field will resize as needed.     |
| false               | (Default) The edit field will not resize. |

## Echo Char property

When this property is not empty, the character specified appears in the text component as the user types text. This property is useful for password fields, for example, where you don't want the characters a user enters to display on the screen.

### Runtime modification

At run time, use the `setEchoChar` method to modify this property.

### Settings

You can use any single alphanumeric character as the echo character.

| <b>Valid values</b> | <b>Description</b>          |
|---------------------|-----------------------------|
| empty               | (Default) Turn echoing off. |
| non-empty           | Echo specified character.   |



## Editable property

Specifies whether the user can edit selected text on a list in a text-based component, such as `TextField` or `TextArea`.

### Runtime modification

You can change this property at run time using the `setEditable` method.

### Settings

| Valid values | Description                              |
|--------------|------------------------------------------|
| true         | The user can edit text in the component. |
| false        | The text in the component is read only.  |





## Enabled property

Enables or disables a component.

### Runtime modification

At run time, use the `setEnabled` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                   |
|---------------------|----------------------------------------------------------------------|
| true                | (Default) The component can recognize events when it receives focus. |
| false               | The component will not recognize events.                             |



## Enforce Minimum Dimension property

Prevents the dragging of a split between panels from making a panel smaller than the minimum size of its component.

### Runtime modification

At run time, use the `setEnforceMinDim` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                                                           |
|---------------------|--------------------------------------------------------------------------------------------------------------|
| false               | (Default) Dragging a split between panels may make the panel smaller than the minimum size of its component. |
| true                | Dragging a split between panels may never make the panel smaller than the minimum size of its component.     |



## Fill Color property

Specifies the color that fills the component when the Fill Mode property is true.

To set a custom color, choose Custom from the drop-down in the Property List window and choose a color from the color palette.

### Runtime modification

At run time, use the `setFillColor` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                      |
|---------------------|-----------------------------------------|
| black               | (Default) Makes the enabled text black. |
| blue                | Makes the enabled text blue.            |
| cyan                | Makes the enabled text cyan.            |
| darkGray            | Makes the enabled text dark gray.       |
| gray                | Makes the enabled text gray.            |
| green               | Makes the enabled text green.           |
| lightGray           | Makes the enabled text light gray.      |
| magenta             | Makes the enabled text magenta.         |
| orange              | Makes the enabled text orange.          |
| pink                | Makes the enabled text pink.            |
| red                 | Makes the enabled text red.             |
| white               | Makes the enabled text white.           |
| yellow              | Makes the enabled text yellow.          |



## Fill Mode property

Determines whether a shape component is automatically filled with the color specified by its Fill Color property.

### Runtime modification

At run time, use the `setFillMode` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                         |
|---------------------|----------------------------------------------------------------------------|
| true                | The component is filled with the color defined in the Fill Color property. |
| false               | (Default) The component is not filled with a color.                        |

## Fill property

This property is a subproperty of [Grid Bag Constraints](#) . To access this property, set the component's parent container's [Layout property](#) to GridBagLayout.

Enabled when the component's display area is larger than the component's requested size. It determines whether (and how) to resize the component, and resizes the component according to the settings listed below.

This property is valid only for components placed within containers using the GridBagLayout layout manager.

### Runtime modification

At run time, use the `setConstraints` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Numeric</b> | <b>Description</b>                                                                                               |
|---------------------|----------------|------------------------------------------------------------------------------------------------------------------|
| NONE                | 0              | (Default) The component is not resized.                                                                          |
| BOTH                | 1              | Makes the component fill the display area, vertically and horizontally.                                          |
| HORIZONTAL          | 2              | Makes the component wide enough to fill its display area horizontally. The component's height is unchanged.      |
| VERTICAL            | 3              | Makes the component tall enough to fill its display area vertically. Does not affect the width of the component. |

## Font property

Determines the font for a component's text. This property is broken into the subproperties that are accessed from the Font property dropdown list box.

This font is only used when the Inherit Font property is false. Choosing a font automatically sets that property to false.

All visual components and containers support this property.

Customized settings display as follows in the INIT\_CONTROL code block:

```
comboBox1.setFont(new Font("TimesRoman", Font.ITALIC, 14));
```

### Runtime modification

At run time, the `setFont` method is typically used to modify this property.

---

#### Name

Specifies the name of the font displaying text within a component. The pulldown menu lists available fonts. To set the current font to match the parent font, change the Inherit Font property to `true`.

#### Size property

Sets the font size in points.

| Valid values | Description                               |
|--------------|-------------------------------------------|
| 12           | (Default) 12 point font.                  |
| 1-32767      | Valid points sizes are within this range. |

#### Style:Bold

Sets component text to bold.

| Valid values | Description                                |
|--------------|--------------------------------------------|
| true         | Set component text to bold.                |
| false        | (Default) Sets component text to not bold. |

#### Style:Italic

Sets component text to italicized.

| Valid values | Description                                  |
|--------------|----------------------------------------------|
| true         | Set component text to italic.                |
| false        | (Default) Sets component text to not italic. |

## Foreground property

Sets the color displayed for the text in a component. This color is only used when the Inherit Foreground property is false. Choosing a foreground color automatically sets that property to false.

To set a custom color, choose Custom from the drop-down in the Property List window and choose a color from the color palette.

All visual components and containers support this property.

### Runtime modification

At run time you can change background or foreground colors using the component's `setBackground` or `setForeground` method.

### Settings

| Valid values | Description                               |
|--------------|-------------------------------------------|
| black        | (Default) Makes the component text black. |
| blue         | Makes the component text blue.            |
| cyan         | Makes the component text cyan.            |
| darkGray     | Makes the component text dark gray.       |
| gray         | Makes the component text gray.            |
| green        | Makes the component text green.           |
| lightGray    | Makes the component text light gray.      |
| magenta      | Makes the component text magenta.         |
| orange       | Makes the component text orange.          |
| pink         | Makes the component text pink.            |
| red          | Makes the component text red.             |
| white        | Makes the component text white.           |
| yellow       | Makes the component text yellow.          |

## Format on Display

Defines the format in which the date, time, or timestamp values are displayed. Text phrases may also be entered as long as they do not contain any of the valid values.

Example: "The date: D\* M\* D%TH, Y\* H%:mm:ss AM" will print "The date: Friday October 12th , 1973 2:34:54 PM"

**Note:** If the Format on Display values do not include all the data elements provided by the database, only the values entered into the property list will display. For example, entering "MM/DD" in Format on Display displays "07/01" even though the data from the database is entered as "07/01/1996"

| Valid Value | Description                                                   |
|-------------|---------------------------------------------------------------|
| DD          | Day - 2 digits [01-31]                                        |
| D%          | Day - 1 or 2 digits [1-31]                                    |
| D+          | Day - name of the day abbreviated [Mon.-Sun.]                 |
| D*          | Day - name of the day complete [Monday-Sunday]                |
| TH          | puts the [ st-nd-rd-th ] element                              |
| MM          | Month - 2 digits [01-12]                                      |
| M%          | Month - 1 to 2 digits [1-12]                                  |
| M+          | Month - name of the month abbreviated [Jan.-Dec.]             |
| M*          | Month - complete name of the month [January-December]         |
| YY          | Year - 2 digits                                               |
| Y*          | Year - 4 digits                                               |
| hh          | Hour - 2 digits                                               |
| h%          | Hour - 1 or 2 digits                                          |
| HH          | Hour - 2 digits, 12 hour clock                                |
| H%          | Hour - 1 or 2 digits, 12 hour clock                           |
| AM          | adds a AM or PM symbol                                        |
| mm          | Minutes - 2 digits                                            |
| m%          | Minutes - 1 or 2 digits                                       |
| ss          | Seconds - 2 digits                                            |
| s%          | Seconds - 1 or 2 digits                                       |
| n1,n2...n9  | fractions of a second, number specifies the number of digits. |

See [DBTimestamp component](#), and [Format on Entry](#).





## Format on Entry

Defines the order the user must follow to enter a valid timestamp. It can be just a String containing "M", "D", "Y", "h", "m", "s" and "n" or a string using the values for Format on Display.

See [DBTimestamp component](#), and [Format on Display](#).



## Frame Name property

Determines the frame used to show a URL document in a browser or applet viewer.

### Runtime modification

At run time, use the `setFrame` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                         |
|---------------------|------------------------------------------------------------|
| empty               | (Default) The name is blank. Equivalent to “_self”.        |
| “_self”             | show document in the current frame                         |
| “_parent”           | show document in the parent frame                          |
| “_top”              | show document in the topmost frame                         |
| “_blank”            | show document in a new unnamed toplevel window             |
| all others          | show document in a new toplevel window with the given name |

## Gap Color property

Sets the display color for the [SplitterPanel.component](#) 's gap between subpanels.

To set a custom color, choose Custom from the drop-down in the Property List window and choose a color from the color palette.

### Runtime modification

At run time, use the `setGapColor` method to modify this property.

### Settings

| Valid values | Description                         |
|--------------|-------------------------------------|
| black        | Makes the gap black.                |
| blue         | Makes the gap blue.                 |
| cyan         | Makes the gap cyan.                 |
| darkGray     | Makes the gap dark gray.            |
| gray         | Makes the gap gray.                 |
| green        | Makes the gap green.                |
| lightGray    | (Default) Makes the gap light gray. |
| magenta      | Makes the gap magenta.              |
| orange       | Makes the gap orange.               |
| pink         | Makes the gap pink.                 |
| red          | Makes the gap red.                  |
| white        | Makes the gap white.                |
| yellow       | Makes the gap yellow.               |



## Gap Width property

The distance, in pixels, to space between boxes drawn within the `ProgressBar` component.

This property is only used for `ProgressBars` with a `false` `Box Bar Style` property value.

### Runtime modification

At run time, use the `setGapWidth` method to modify this property.

## Grid Bag Constraints properties

Determines how components are positioned inside a container that uses a GridBagLayout layout manager. This property is not available unless the [Layout property](#) for the component's container is set to GridBagLayout.

The Grid Bag Constraints property applies to visual components, but not their container. However, their container must have its Layout property set to GridBagLayout.

Grid Bag Constraints are a set of properties that determine how a visual component will grow, shrink or reposition itself; based on how its container is resized. All grid bag constrained components have a separate Grid Bag Constraints property value. This means that unforeseen size and boundary conflicts between components can occur when the container is set to certain sizes and dimensions. You must manually test your component layout design to determine that all components within a container behave appropriately.

The properties for components within a grid bag layout are:

[Anchor](#)

[Fill](#)

[Grid](#)

[Insets](#)

[Internal Pad X](#)

[Internal Pad Y](#)

[Weight X](#)

[Weight Y](#)

### Runtime modification

At run time, use the `setConstraints` method to modify this property.

## Grid property

This property is a subproperty of [Grid Bag Constraints](#). To access this property, set the component's parent container's [Layout property](#) to GridBagLayout.

These properties specify the characteristics of the component's display area within a grid bag layout.

### Runtime modification

At run time, use the `setConstraints` method to modify this property.

---

### Grid X property

Sets the cell where a component's display area begins. The leftmost cell has `gridx = 0`.

### Grid Y property

Specifies the cell number at the top of the component's display area. The topmost cell has `gridy = 0`.

### Grid Width property

Specifies the number of cells in a row to use for the component's display area.

### Grid Height property

Specifies the number of cells in a column to use for the component's display area.

Use the value `GridBagConstraints.REMAINDER` to specify that the component be the last one in its column. Use the value `GridBagConstraints.RELATIVE` to specify that the component be the next to last one in its column.

### Settings

The settings for Grid X are:

| Valid values | Description                                                                                                             |
|--------------|-------------------------------------------------------------------------------------------------------------------------|
| -1           | (Default) Places the component immediately to the right of the component that was most recently added to the container. |
| x            | An integer expression specifying the cell number where the left side of a component's display area begins.              |

The settings for Grid Y are:

| Valid values | Description                                                                                                                  |
|--------------|------------------------------------------------------------------------------------------------------------------------------|
| -1           | (Default) Places the component below the component that was added to the container was most recently added to the container. |
| y            | An integer expression specifying the cell number where the top of a component's display area begins.                         |

The settings for Grid Width are:

| Valid values | Description                                                                                        |
|--------------|----------------------------------------------------------------------------------------------------|
| 1            | (Default) Specifies that the component use the space remaining in its column for its display area. |
| w            | An integer expression that specifies the width of the display area, in columns.                    |

The settings for Grid Height are:

| Valid values | Description                                                                                 |
|--------------|---------------------------------------------------------------------------------------------|
| 1            | (Default) Specifies that the component use the last cell in its column as its display area. |
| h            | An integer expression that specifies the width of the display area, in rows.                |



## Group property

Specifies the name for a set of Checkbox components to be treated as a group or set. If the check box group does not already exist, Visual Café creates a group with the specified name.

When the Group property is specified, the Checkbox behaves like a radio button. Only one of the components in the check box group can be "on" at a time.

### Runtime modification

At run time, use the `setCheckboxGroup` method to modify this property.

### Settings

The value of the Group property must be a valid variable name.

## Heading Background property

Defines the color to use for the background of all cell headings in the component.

To set a custom color, choose Custom from the drop-down in the Property List window and choose a color from the color palette.

### Runtime modification

At run time, use the `setHeadingBg` or `setHeadingColors` method to modify this property.

### Settings


| Valid values | Description                                        |
|--------------|----------------------------------------------------|
| black        | Makes the heading background black.                |
| blue         | Makes the heading background blue.                 |
| cyan         | Makes the heading background cyan.                 |
| darkGray     | Makes the heading background dark gray.            |
| gray         | Makes the heading background gray.                 |
| green        | Makes the heading background green.                |
| lightGray    | (Default) Makes the heading background light gray. |
| magenta      | Makes the heading background magenta.              |
| orange       | Makes the heading background orange.               |
| pink         | Makes the heading background pink.                 |
| red          | Makes the heading background red.                  |
| white        | Makes the heading background white.                |
| yellow       | Makes the heading background yellow.               |





## Heading Font property

Defines the font used to display all cell heading text within the component.

In the property field, click on the  button (or double-click in the field) to display the font dialog box. Select the font combination that you want.

### Runtime modification

At run time, use the `setHeadingFont` method to modify this property.

### Settings

The default value is

```
"SansSerif", java.awt.Font.PLAIN, 12
```

## Heading Foreground property

Defines the color to use for all cell heading text in the component.

To set a custom color, choose Custom from the drop-down in the Property List window and choose a color from the color palette.

### Runtime modification

At run time, use the `setHeadingFg` or `setHeadingColors` method to modify this property.

### Settings

| Valid values | Description                             |
|--------------|-----------------------------------------|
| black        | (Default) Makes the enabled text black. |
| blue         | Makes the enabled text blue.            |
| cyan         | Makes the enabled text cyan.            |
| darkGray     | Makes the enabled text dark gray.       |
| gray         | Makes the enabled text gray.            |
| green        | Makes the enabled text green.           |
| lightGray    | Makes the enabled text light gray.      |
| magenta      | Makes the enabled text magenta.         |
| orange       | Makes the enabled text orange.          |
| pink         | Makes the enabled text pink.            |
| red          | Makes the enabled text red.             |
| white        | Makes the enabled text white.           |
| yellow       | Makes the enabled text yellow.          |



## Help Button Visible property

Determines whether the Help button is shown in the Wizard.

### Runtime modification

Use the `setHelpButtonVisible` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                    |
|---------------------|---------------------------------------|
| true                | (Default) The Help button is visible. |
| false               | The Help butto is not visible.        |



## Help Menu property

Specifies if the Menu component is the Help menu.

### Runtime modification

At run time, use the `setHelpMenu` method to modify this property.

### Settings


| <b>Valid values</b> | <b>Description</b>                                 |
|---------------------|----------------------------------------------------|
| true                | The menu component is the Help menu.               |
| false               | (Default) The menu component is not the Help menu. |



## HTML Link URL property

The URL of the document the component links to.

To define the URL:

1. Click in the HTML Link URL field in the Property List.
2. Click on the  button (or double-click in the field) to display the HTML Link URL dialog box.
3. Enter the name of the target HTML file.

### Runtime modification

At run time, use the `setLinkURL` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b> |
|---------------------|--------------------|
| empty               | (Default)          |
| URL                 | A valid URL.       |



## Image Style property

Specifies how to display the image inside the component.

### Runtime modification

Use the `setStyle` method (for `ImagePanels` and `ImageViewers`) or `setImageStyle` method (for `ImageButtons`) to modify this property.

### Settings


| Valid values                     | Description                                                                                         |
|----------------------------------|-----------------------------------------------------------------------------------------------------|
| <code>IMAGE_TILED</code>         | The image is drawn repeatedly, filling the component.                                               |
| <code>IMAGE_CENTERED</code>      | (Default) The image is drawn once, centered in the component.                                       |
| <code>IMAGE_SCALED_TO_FIT</code> | The image is drawn once, resized to fill up the entire component.                                   |
| <code>IMAGE_NORMAL</code>        | (for <code>ImageButtons</code> ) The image is drawn once in the upper-left corner of the component. |



## Image URL property

The URL of the image to display in the component. The image should be in GIF or JPEG format.

To specify the URL:

1. Click in the Image URL field in the Property List.
2. Click on the  button (or double-click in the field) to display the Image URL dialog box.
3. Enter the name of the target HTML file.

### Runtime modification

Use the `setImageURL` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                         |
|---------------------|--------------------------------------------|
| empty               | (Default) No image is displayed.           |
| URL                 | The URL of a GIF or JPEG image to display. |



## Increment property

Determines the amount that the component value is incremented, plus or minus, when the user presses the component's up or down arrow.

### Runtime modification

Use the `setIncrement` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                   |
|---------------------|------------------------------------------------------|
| 1                   | (Default) The component value is incremented by one. |





## Inherit Background property

Determines where a component gets its background color setting from. When true the component uses the background color of its parent container. When false the component uses the color specified by the Background property.

All components and containers support this property.

### Runtime modification

At run time, use the `setBackground` method to modify this property. Passing a null value will make the component get its background from its parent container.

### Settings

| <u>Valid values</u> | <u>Description</u>                                                                                                |
|---------------------|-------------------------------------------------------------------------------------------------------------------|
| true                | (Default) The component uses the background color in its parent container's <a href="#">Background property</a> . |
| false               | The component uses its own <a href="#">Background property</a> .                                                  |



## Inherit Font property

Determines where a component gets its font settings from . When true the component uses the font of its parent component. When false the component uses the font specified by the Font property.

All visual components and [containers](#) support this property.

### Runtime modification

At run time, use the `setFont` method to modify this property. Passing a null value will make the component get its font from its parent component.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                                 |
|---------------------|------------------------------------------------------------------------------------|
| true                | (Default) The component uses the font set in its parent component's Font property. |
| false               | The component uses its own Font property.                                          |



## Inherit Foreground property

Determines where a component gets its foreground color setting from. When true the component uses the foreground color of its parent container. When false the component uses the color specified by the Foreground property.

All components and containers support this property.

### Runtime modification

At run time, use the `setForeground` method to modify this property. Passing a null value will make the component get its foreground from its parent container.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                                                                |
|---------------------|-------------------------------------------------------------------------------------------------------------------|
| true                | (Default) The component uses the foreground color in its parent container's <a href="#">Foreground property</a> . |
| false               | The component uses its own <a href="#">Foreground property</a> .                                                  |

## Inset Padding properties

Specifies the inset padding, in pixels, for a component. This is the distance between the drawn border and the usable display area within the border. It is used to determine the size of the panel contained within this component's borders.

### Runtime modification

At run time, use the `setIPad...` methods to modify this property.

### Settings

| Valid values | Description                                                                                        |
|--------------|----------------------------------------------------------------------------------------------------|
| 0            | Specifies that there is no space between the edge of a component and the edge of its display area. |
| n            | An integer expression that sets the number of pixels.                                              |

---

### Inset Padding Bottom

Sets the number of pixels between the bottom of the drawn border and the display area within that border. The default value is 7.

### Inset Padding Sides

Sets the number of pixels between the side of the drawn border and the display area within that border. The default value is 4.

### Inset Padding Top

Sets the number of pixels between the top of the drawn border and the display area within that border. The default value is 2.

## Internal Pad X property

This property is a subproperty of [Grid Bag Constraints](#) . To access this property, set the component's parent container's [Layout property](#) to GridBagLayout.

Specifies the amount of space in pixels, to add to the minimum size of the component to determine its overall width. This property is inaccessible unless a component is inside a container which uses a grid bag layout.

### Runtime modification

At run time, use the `setConstraints` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                                                                                                                                                                                  |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0 (zero)            | (Default) Specifies that the component's display at its minimum width.                                                                                                                                                              |
| n                   | An integer expression that specifies the number of additional pixels to add to the minimum width of the component. Note, the width of the component is at least its minimum width in pixels plus twice its Internal Pad X property. |

## Internal Pad Y property

This property is a subproperty of [Grid Bag Constraints](#) . To access this property, set the component's parent container's [Layout property](#) to GridBagLayout.

Specifies the amount of space to add to the minimum size of the component to determine its overall height. This property is inaccessible unless a components is inside a container which uses a gridbag layout.

### Runtime modification

At run time, use the `setConstraints` method to modify this property.

### Settings

| <u>Valid values</u> | <u>Description</u>                                                                                                                                                                                                                    |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0 (zero)            | (Default) Specifies that the component's display at its minimum height.                                                                                                                                                               |
| n                   | An integer expression that specifies the number of additional pixels to add to the minimum height of the component. Note, the width of the component is at least its minimum height in pixels plus twice its Internal Pad Y property. |



## Items property

A list of strings that populate the list portion of a component.

To create an list item, type the item value within the list box. To create a new list item, press CTRL-ENTER and type the next item value. (The Macintosh version provides a button.)

By default, the first item added to the choice menu typically becomes the selected item, until the user makes a different selection, or your program calls one of the select methods.

### Runtime modification

At run time, use the `addItem` methods (or `append` for the `TreeView` component) to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>            |
|---------------------|-------------------------------|
| [empty]             | No items are in the list.     |
| [list]              | The list contains some items. |



## Label Alignment property

Specifies the alignment of text in the label area.

### Runtime modification

At run time, use the `setAlignStyle` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                    |
|---------------------|-------------------------------------------------------|
| ALIGN_CENTERED      | (Default) Center text within the label area.          |
| ALIGN_LEFT          | Justify the text to the left edge of the label area.  |
| ALIGN_RIGHT         | Justify the text to the right edge of the label area. |



## Label Color property

Specifies the color for a label (Label property) appearing within the component.

To set a custom color, choose Custom from the drop-down in the Property List window and choose a color from the color palette.

### Runtime modification

At run time, use the `setLabelColor` method to modify this property.

### Settings

| Valid values | Description                             |
|--------------|-----------------------------------------|
| black        | (Default) Makes the enabled text black. |
| blue         | Makes the enabled text blue.            |
| cyan         | Makes the enabled text cyan.            |
| darkGray     | Makes the enabled text dark gray.       |
| gray         | Makes the enabled text gray.            |
| green        | Makes the enabled text green.           |
| lightGray    | Makes the enabled text light gray.      |
| magenta      | Makes the enabled text magenta.         |
| orange       | Makes the enabled text orange.          |
| pink         | Makes the enabled text pink.            |
| red          | Makes the enabled text red.             |
| white        | Makes the enabled text white.           |
| yellow       | Makes the enabled text yellow.          |



## **Label property**

Sets the text that appears in a component as its label.

### **Runtime modification**

At run time, use the `setLabel` method to modify this property.

### **Settings**

The valid value for Label is any string expression including all alphanumeric characters.

## Layout property

Sets the `LayoutManager` used to arrange components within a container.

A container is a component that contains other components. In Java, the `LayoutManager` is an interface for an object that positions components within a container. Java provides five predefined `LayoutManagers`, which you use by calling the container's `setLayout` method. In addition, you can write your own `LayoutManager` by writing a class that implements the `LayoutManager` interface.

Visual Café simplifies the layout process by creating a "Layout property" on the Property List window for your container. This allows you to select or change the `LayoutManager` with the click of a mouse button at any time during your GUI design process. You set the Layout property, and then drag and drop components onto the Forms Designer window.

At design time, when you change a container's Layout property, the properties of the container's child components change to allow you to specify how the component is arranged inside the container.

### Runtime modification

To use a `LayoutManager` in code:

1. Instantiate a Container object,
2. Instantiate the desired type of `LayoutManager`,
3. Use the container's `setLayout` method to specify the `LayoutManager` be used,
4. Instantiate, configure, set, and add each component to the container in the desired order.

### Settings

| Valid values               | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| None                       | Positions and sizes components within a container precisely where you place and size them.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <code>BorderLayout</code>  | Positions components within a container using individual component placement. When you specify <code>BorderLayout</code> , the <a href="#">Placement property</a> is added to each component in the container. You can control component spacing by using the layout's Horizontal and Vertical Gap property in pixels.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <code>CardLayout</code>    | Contains several 'cards'. Only one card is visible at a time, allowing you to flip through the cards. Each card supports its own layout manager. You can control component spacing by using the layout's Horizontal and Vertical Gap property in pixels.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <code>FlowLayout</code>    | Arranges components left to right until no more components fit on the same line, and then moves to the next line. By default, each line is centered. You need to modify the component size and placement within the flow layout line. You can control component spacing by using the layout's Horizontal and Vertical Gap property in pixels. If you do not want the lines centered, use the layout's <a href="#">Alignment property</a> to specify the justification of each row of components in the container.                                                                                                                                                                                                                                                                                                                                                                                     |
| <code>GridBagLayout</code> | Aligns components vertically and horizontally, without requiring that the components be the same size. Each row and column in a <code>GridBagLayout</code> can expand to hold its largest component, and pack components to conserve space relative to bordering cells—which is similar to how table rows and columns expand to hold their largest cells. <code>GridBagLayout</code> manages a rectangular grid of cells, with each component occupying one or more cells. Components within the <code>GridBagLayout</code> are positioned based on their <a href="#">Grid Bag Constraints properties</a> . You also need to carefully test <code>GridBagConstraints</code> properties for each component displaying in a <code>GridBagLayout</code> container to determine that each component expands, shrinks and repositions itself appropriately, relative to other components in the container. |
| <code>GridLayout</code>    | A layout manager that divides a container into rows and columns of uniform rectangular cells. The <code>GridLayout</code> can have a fixed number of <a href="#">Rows</a> , or <a href="#">Columns</a> , or both—but all cells maintain the same size. After placing a component within a cell, you need to adjust the component size and position. You can control component spacing by using the layout's Horizontal and Vertical Gap property in pixels.                                                                                                                                                                                                                                                                                                                                                                                                                                           |



## Line Thickness property

The width of the line in pixels.

### Runtime modification

Use the `setLineThickness` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                  |
|---------------------|-------------------------------------|
| 1                   | (Default)                           |
| 1-32767             | Valid values are within this range. |



## List Down property

Specifies whether the ComboBox's list is initially visible or not.

### Runtime modification

At run time, use the `setListDown` methods to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                           |
|---------------------|----------------------------------------------|
| false               | (Default) The list is not initially visible. |
| true                | The list is initially visible.               |



## List Items property

Specifies the items that populate the list portion of a component.

To create an list item, type the item value within the list box. To create a new list item, press CTRL-ENTER and type the next item value. (The Macintosh version provides a button.)

### Runtime modification

At run time, use the `setListItems` methods to modify this property.

### Settings

| Valid values | Description                   |
|--------------|-------------------------------|
| [empty]      | No items are in the list.     |
| [list]       | The list contains some items. |



## Loop Count property

Sets the number of times to show an animated sequence. This value is ignored if the Repeat Mode property is set to true.

### Runtime modification

At run time, use the `setNumLoops` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                 |
|---------------------|--------------------------------------------------------------------|
| 1                   | Displays the sequence one time. Holds a display on the last image. |
| integer             | Any whole number, shows the animation this number of times.        |



## Main MenuBar property

Specifies the menu bar to display in a Frame. You can create more than one menu bar in a frame, but only one Menu Bar can be displayed at a time.

### Runtime modification

At run time, you can display a different menu bar by calling the Frame's `setMenuBar` method.

### Settings

| Valid values | Description                         |
|--------------|-------------------------------------|
| true         | The menu bar displays in the frame. |
| false        | The menu bar is not displayed.      |



## Mask property

Controls the user input to the component.

The `FormattedTextField`, and derived components, use a set of predefined characters that define the mask. When defining a mask, be sure to preface any character that is to be a part of the mask with the Escape character (`'/'`), including spaces. For instance, specify the mask for a long distance telephone number as: `/(999)/ 999/-9999`.

The following are valid characters that can be used for a mask:

| <u>To restrict the digit position to:</u>  | <u>Use:</u> |
|--------------------------------------------|-------------|
| An escape                                  | /           |
| Digit                                      | 9           |
| Sign (+ or -)                              | +           |
| Sign or digit                              | -           |
| Any upper case alphabetic character        | A           |
| Any lower case alphabetic character        | a           |
| Any alphabetic character, forced uppercase | U           |
| Any alphabetic character, forced lowercase | L           |
| Any alphabetic or digit, upper case        | X           |
| Any alphabetic or digit, lower case        | x           |
| Any alphabetic or digit, forced upper case | N           |
| Any alphabetic or digit, forced lower case | n           |
| Any character (wildcard)                   | *           |

The following components have predefined masks that cannot be edited:

| <u>Component</u>                     | <u>Default mask</u>              |
|--------------------------------------|----------------------------------|
| <code>IntlLongDistPhoneNumber</code> | <code>999/-999/-999/-9999</code> |
| <code>LocalPhoneNumber</code>        | <code>999/-9999</code>           |
| <code>LongZipCode</code>             | <code>99999/-9999</code>         |
| <code>PostalCode</code>              | <code>A9A/-9A9</code>            |
| <code>SocialInsuranceNumber</code>   | <code>999/-999/-999</code>       |
| <code>SocialSecurityNumber</code>    | <code>999/-99/-9999</code>       |
| <code>USLongDistPhoneNumber</code>   | <code>999/-999/-9999</code>      |
| <code>ZipCode</code>                 | <code>99999</code>               |

### Runtime modification

At run time, the `FormattedTextField` component can use the `setMask` method to modify this property.

### Settings

| <u>Valid values</u> | <u>Description</u>                  |
|---------------------|-------------------------------------|
| empty               | (Default) The default mask is used. |



## Max Value property

The maximum value a Slider component may have.

### Runtime modification

Use the `setMaxValue` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>              |
|---------------------|---------------------------------|
| 10                  | (Default) Maximum value is ten. |
| integer             | The maximum value.              |



## Maximum and Minimum properties

Use these properties to specify the maximum and minimum value range for a spinner.

### Runtime modification

Use the `setMax` or `setMin` method to modify this property.

Use the `getMax` or `getMin` method for the current value of this property.



## Maximum property

Sets the maximum value of the scroll thumb when it is in its bottom or rightmost position of a scrollbar.

The scrollbar [component](#) supports this property.

### Runtime modification

At run time, use the `setMaximum` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                          |
|---------------------|---------------------------------------------|
| 0                   | (Default) The maximum scrollbar value is 0. |
| integer             | The maximum scrollbar value.                |



## Menu Shortcut property

Specifies a shortcut key that may be used to invoke the MenuItem. This property consists of the subproperties Key Code and Use Shift Key, described below.

### Runtime modification

At run time, use the `setShortcut` method to modify this property.

---

### Key Code

The raw keycode that invokes this menu item. Choose the desired value from the drop-down list. This is the same type of value as the `keyCode` in the `KeyEvent` class.

### Use Shift Key

Determines whether this shortcut requires the shift key pressed to invoke.

| Valid values | Description                       |
|--------------|-----------------------------------|
| false        | (Default) Shift key not required. |
| true         | Shift key required.               |

## Message Hilite Color property

The highlighted color for message text. A text message is highlighted in this color when the mouse cursor is over it and there is a corresponding non-null URL link for that message.

To set a custom color, choose Custom from the drop-down in the Property List window and choose a color from the color palette.

### Runtime modification

Use the `setHiliteColor` method to modify this property.

### Settings

| Valid values | Description                                       |
|--------------|---------------------------------------------------|
| black        | Makes the highlighted message text black.         |
| blue         | Makes the highlighted message text blue.          |
| cyan         | Makes the highlighted message text cyan.          |
| darkGray     | Makes the highlighted message text dark gray.     |
| gray         | Makes the highlighted message text gray.          |
| green        | Makes the highlighted message text green.         |
| lightGray    | Makes the highlighted message text light gray.    |
| magenta      | Makes the highlighted message text magenta.       |
| orange       | Makes the highlighted message text orange.        |
| pink         | Makes the highlighted message text pink.          |
| red          | (Default) Makes the highlighted message text red. |
| white        | Makes the highlighted message text white.         |
| yellow       | Makes the highlighted message text yellow.        |



## **Message Links property**

A list of URL addresses for message links. Each link corresponds with a message in the ScrollingText's message list. If a message has no link, the entry should be blank.

Selecting this property displays a pop-up dialog. URL addresses are shown in the order that they are placed on the list.

### **Runtime modification**

Use the `setLinkToList` method to modify this property.

### **Settings**

A list of valid URL strings.



## Messages property

A list of strings that specifies the messages to be displayed in the ScrollingText component.

To specify the list of strings to display, type the first item in the list box. Press CTRL+ENTER after each item to add the next item. (The Macintosh version provides a button.)

### Runtime modification

Use the `setMessageList` method to modify this property.

### Settings

| Valid values | Description                                                     |
|--------------|-----------------------------------------------------------------|
| [empty]      | The component does not have a list of values for this property. |
| [list]       | The component has a list of values for this property.           |





## Min Value property

The minimum value a Slider component may have.

### Runtime modification

Use the `setMinValue` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>              |
|---------------------|---------------------------------|
| 1                   | (Default) Minimum value is one. |
| integer             | The minimum value.              |



## Minimum Height and Width properties

Use the Minimum Height and Minimum Width properties to define the smallest size of the container.

This is the value returned by the `getMinimumSize` method.

### Runtime modification

At run time, use the `setMinimumHeight` or `setMinimumWidth` method to modify this property.



## Minimum property

Sets the minimum value of the scroll thumb is in its top or leftmost position of a scrollbar.

### Runtime modification

At run time, use the `setMinimum` method to modify this property.

Move the scroll thumb to its minimum position by calling the `setValue` method for the scrollbar and use the value returned by `getMinimum` as the parameter.

### Settings

| <b>Valid values</b> | <b>Description</b>                          |
|---------------------|---------------------------------------------|
| 0                   | (Default) The minimum scrollbar value is 0. |
| integer             | The minimum scrollbar value.                |



## Mode property

Determines whether the standard file dialog box is used to save files or to locate and open files.

### Runtime modification

This property cannot be changed after the FileDialog is constructed.

### Settings

The settings for Mode are:


| <b>Valid values</b> | <b>Description</b>                                                              |
|---------------------|---------------------------------------------------------------------------------|
| SAVE                | Creates a Save File dialog box that can be used to save a file.                 |
| LOAD                | Creates a Open File dialog box that the user can use to locate and open a file. |



## Mouse Down Image property

The URL of the image to display in the RollOverButton component while the mouse is pressed. The image should be in GIF or JPEG format.<sup>1</sup>

To specify the URL:

1. Click in the Mouse Down Image field in the Property List.
2. Click on the  button (or double-click in the field) to display the URL dialog box.
3. Enter the name of the target HTML file.

### Runtime modification

Use the `setDownURL` method to modify this property.

### Settings


| Valid values | Description                                |
|--------------|--------------------------------------------|
| empty        | (Default)                                  |
| URL          | The URL of a GIF or JPEG image to display. |



## Mouse Over Image property

The URL of the image to display while the mouse is over the component. The image should be in GIF or JPEG format.

To specify the URL:

1. Click in the Mouse Over Image field in the Property List.
2. Click on the  button (or double-click in the field) to display the URL dialog box.
3. Enter the name of the target HTML file.

### Runtime modification

Use the `setOverURL` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                         |
|---------------------|--------------------------------------------|
| empty               | (Default)                                  |
| URL                 | The URL of a GIF or JPEG image to display. |



## Multiple Mode property

Determines whether a list allows the user to select multiple items from the list simultaneously.

### Runtime modification

Use the `setMultipleMode` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                             |
|---------------------|----------------------------------------------------------------|
| true                | The list box allows multiple selections.                       |
| false               | (Default) The list box allows only a single selection at time. |



## Multiple Selections property

Determines whether a list allows the user to select multiple items from the list simultaneously.

### Runtime modification

Use the `setMultipleSelections` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                             |
|---------------------|----------------------------------------------------------------|
| true                | The list box allows multiple selections.                       |
| false               | (Default) The list box allows only a single selection at time. |





## **Name property**

Specifies the name of the component as used in the Java source code.

All components support this property.

### **Runtime modification**

This property can not be changed at runtime.

### **Settings**

Any valid Java identifier. A character string less than 256 characters. The default name for the component is the master component's name and a number.



## Notify Delay property

The delay, in milliseconds, to wait between issuing new action events while the mouse button is continuously pressed in the component. This will only happen if the Notify While Pressed property is true.

### Runtime modification

At run time, use the `setNotifyDelay` method to modify this property.

### Settings

| Valid Values | Description                |
|--------------|----------------------------|
| 1000         | (Default)                  |
| integer      | The delay in milliseconds. |



## Notify While Pressed property

Determines whether action events are repeatedly issued while the mouse is pressed in the component. If true, the delay between action events is specified with Notify Delay property.

### Runtime modification

At run time, use the `setNotifyWhilePressed` method to modify this property.

### Settings

| Valid values | Description                           |
|--------------|---------------------------------------|
| false        | (Default) Action events are not sent. |
| true         | Action events are sent.               |



## Number Of Columns property

The number of columns to initialize the Grid with.

### Runtime modification

At run time, use the `createColumns` method to modify this property. Note that this method deletes all pre-existing columns in the Grid.

### Settings

| Valid Values | Description                                         |
|--------------|-----------------------------------------------------|
| 0            | (Default)                                           |
| integer      | The desired number of columns for the Grid to have. |



## Number Of Rows property

The number of rows to initialize the Grid with. This also determines the value returned by `getPreferredSize`.

### Runtime modification

At run time, use the `setPreferredSize` method to modify this property.

### Settings

| <b>Valid Values</b> | <b>Description</b>                               |
|---------------------|--------------------------------------------------|
| 0                   | (Default)                                        |
| integer             | The desired number of rows for the Grid to have. |



## Orientation property (Scrollbar, ToolBarPanel)

Sets the component to display either horizontally or vertically.

### Runtime modification

At run time, use the `setOrientation` method to modify this property.

### Settings

| <b>Valid value</b> | <b>Description</b>                        |
|--------------------|-------------------------------------------|
| VERTICAL           | (Default) Specifies vertical orientation. |
| HORIZONTAL         | Specifies horizontal orientation.         |



## Orientation property (Spinner)

Determines whether the spinner arrows are displayed one above the other (vertically) or side-by-side (horizontally)

### Runtime modification

At run time, use the `setOrientation` method to modify this property.

### Settings

| <b>Valid value</b>     | <b>Description</b>                                         |
|------------------------|------------------------------------------------------------|
| ORIENTATION_VERTICAL   | (Default) Display the spinner buttons one above the other. |
| ORIENTATION_HORIZONTAL | Display the spinner buttons side-by-side.                  |

## ▶ **Padding properties**

Specifies padding space in pixels, for a reserved margin around a component. This is the distance between the drawn border and the actual bounds of the component.

### **Runtime modification**

At run time, use the `setPadding...` methods to modify this property.

### **Settings**

| <b>Valid values</b> | <b>Description</b>                                                                                 |
|---------------------|----------------------------------------------------------------------------------------------------|
| 0                   | Specifies that there is no space between the edge of a component and the edge of its display area. |
| n                   | A integer expression.                                                                              |

---

### **Padding Bottom**

Sets the number of pixels between the component bounds and the bottom of the drawn border. The default value is 6.

### **Padding Left**

Sets the number of pixels between the component bounds and the left side of the drawn border. The default value is 6.

### **Padding Right**

Sets the number of pixels between the component bounds and the right side of the drawn border. The default value is 6.

### **Padding Top**

Sets the number of pixels between the component bounds and the top of the drawn border. The default value is 10.





## Paused property

Specifies whether the nervous text animation is suspended or running.

### Runtime modification

Use the `setPaused` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                               |
|---------------------|--------------------------------------------------|
| false               | (Default) The nervous text animation is running. |
| true                | The nervous text animation is still.             |



## Placement property

Positions a component within a container managed by the BorderLayout layout manager, see [Layout property](#) .

### Runtime modification

The placement must be specified when the component is added to its container using the `add` method. To change placement after that, the component must be removed and then added again with a different placement value.

### Settings

- n If necessary, a component whose placement is North or South is horizontally resized to the width of the container. A component whose placement is East or West is vertically resized to the height of the container.
- n Invalid string values are ignored.

| <b>Valid values</b> | <b>Description</b>                                                           |
|---------------------|------------------------------------------------------------------------------|
| North               | Places the component at the top of the container.                            |
| South               | Places the component at the bottom of the container.                         |
| East                | Places the component along the right side of the container.                  |
| West                | Places the component along the left side of the container.                   |
| Center              | Places the component in the center of the container, in the remaining space. |
| (Empty)             | (Default) Same as Center.                                                    |



## Positive Slope property

Determines if the line will be drawn from the lower-left to the upper-right corner or from the upper-left to the lower-right corner. The corners are determined by the component bounds.

### Runtime modification

Use the `setPositiveSlope` method to modify this property.

### Settings

| Valid values | Description                                                     |
|--------------|-----------------------------------------------------------------|
| true         | (Default) Line is drawn from the lower-left to the upper-right. |
| false        | Line is drawn from the upper-left to the lower-right.           |



## Preview Component property

Specifies if an animation component is “alive” at design time. Form editing is easier when preview is turned off.

### Runtime modification

At run time, use the `setPreviewMode` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                   |
|---------------------|----------------------------------------------------------------------|
| true                | Preview mode is on. The animation component runs during design time. |
| false               | Preview mode is off.                                                 |

## ProgressBar Color property

Specifies the color for the progress bar.

To set a custom color, choose Custom from the drop-down in the Property List window and choose a color from the color palette.

### Settings

| <b>Valid values</b> | <b>Description</b>                     |
|---------------------|----------------------------------------|
| black               | Makes the progress bar black.          |
| blue                | (Default) Makes the progress bar blue. |
| cyan                | Makes the progress bar cyan.           |
| darkGray            | Makes the progress bar dark gray.      |
| gray                | Makes the progress bar gray.           |
| green               | Makes the progress bar green.          |
| lightGray           | Makes the progress bar light gray.     |
| magenta             | Makes the progress bar magenta.        |
| orange              | Makes the progress bar orange.         |
| pink                | Makes the progress bar pink.           |
| red                 | Makes the progress bar red.            |
| white               | Makes the progress bar white.          |
| yellow              | Makes the progress bar yellow.         |



## Propagate Resize property

Determines whether resizing a splitter panel also resizes the component within that panel. If true, that component is scaled to fit within the new panel size, otherwise it is not resized and ends up being clipped as needed when drawn.

### Runtime modification

At run time, use the `setPropResize` method to modify this property.

### Settings

| Valid values | Description                              |
|--------------|------------------------------------------|
| true         | (Default) Resize propagation mode is on. |
| false        | Resize propagation mode is off.          |



## Repeat property

Determines whether the status message is scrolled repeatedly, or just once.

### Runtime modification

At run time, use the `setRepeat` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                   |
|---------------------|------------------------------------------------------|
| true                | (Default) The status message is scrolled repeatedly. |
| false               | The status message is not scrolled repeatedly.       |



## Repeat Automatically property

Specifies if the Timer component resets and starts continuously, generating a series of events.

### Runtime modification

At run time, use the `setRepeat` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                   |
|---------------------|------------------------------------------------------|
| true                | (Default) The timer resets and starts continuously.  |
| false               | The Timer does not repeat. The timer only runs once. |





## Repeat Count property

Sets the number of times to play the list of sounds.

### Runtime modification

At run time, use the `setRepeat` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                              |
|---------------------|-------------------------------------------------|
| -1                  | Repeats forever.                                |
| 1                   | (Default) Plays the list of sounds once.        |
| integer             | The number of times to play the list of sounds. |



## Repeat Mode property

Defines if the component should repeat when finished showing the animation.

### Runtime modification

At run time, use the `setRepeatMode` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                    |
|---------------------|-----------------------------------------------------------------------|
| true                | (Default) The animator automatically starts over again when finished. |
| false               | The animator doesn't start over again when finished.                  |



## Resizable property

Determines whether a Frame or Dialog can be resized at run time.

### Runtime modification

At run time, use the `setResizable` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                              |
|---------------------|-------------------------------------------------|
| true                | The user can resize the component at runtime.   |
| false               | The user can't resize the component at runtime. |



## Right To Left property

Determines whether the status message moves from right-to-left or left-to-right.

### Runtime modification

At run time, use the `setRightToLeft` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                |
|---------------------|---------------------------------------------------|
| true                | (Default) The status message moves right-to-left. |
| false               | The status message moves left-to-right.           |



## Rows property

Specifies the number of rows in the component. When both the row and column values are greater than zero, the `getMinimumSize` method returns a size appropriate for the desired number of rows and columns.

### Runtime modification

At run time, use the `setRows` method to modify this property.

### Settings

| Valid values | Description                                                  |
|--------------|--------------------------------------------------------------|
| 0            | (Default) Don't use when determining minimum component size. |
| 1-32767      | The desired number of rows to display.                       |

## Rows to Display property

Sets the number of rows to display in a list. If there are more items in the list than the number of specified rows, a scroll bar is automatically added to the component. This affects the dimensions returned by the `getPreferredSize` method and determines the number of rows displayed when this component is automatically laid out.

### Runtime modification

At run time, use the `setRowsToShow` method to modify this property.

### Settings

| <u>Valid values</u> | <u>Description</u>                                           |
|---------------------|--------------------------------------------------------------|
| 0                   | (Default) Don't use when determining minimum component size. |
| 1-32767             | The desired number of rows to display.                       |



## Scroll Clean property

Determines whether the message will scroll completely off before scrolling on again.

### Runtime modification

Use the `setScrollClean` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                          |
|---------------------|-----------------------------------------------------------------------------|
| true                | (Default) The message will scroll completely off before scrolling on again. |
| false               | The message will scroll back on before scrolling completely off.            |



## Scroll Direction property

This property specifies the direction the `ScrollingText`'s message will scroll.

### Runtime modification

Use the `setScrollDirection` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                      |
|---------------------|-----------------------------------------|
| SCROLL_LEFT         | (Default) Text move from right to left. |
| SCROLL_RIGHT        | Text moves from left to right.          |





## Scroll Increment property

Determines the increment, in pixels, of a ScrollingPanel. The increment is the amount that is the component scrolls when the user clicks on the scroll arrow.

### Runtime modification

At run time, use the `setScrollLineIncrement` method to modify this property.

### Settings

| Valid values | Description                                             |
|--------------|---------------------------------------------------------|
| 1            | (Default) Scroll one pixel per arrow press.             |
| 0-32767      | The desired number of pixels to scroll per arrow press. |

## Scroll Interval property

Set delay, in milliseconds, between scroll steps. This function controls the speed of scrolling. A lower number indicates a faster speed.

The minimum value of 30.

### Runtime modification

Use the `setScrollInterval` method to modify this property.

### Settings

| Valid Values  | Description                |
|---------------|----------------------------|
| 150           | (Default)                  |
| integer >= 30 | The delay in milliseconds. |



## Scroll Unit property

The number of pixels to move the text on each scroll step.

### Runtime modification

Use the `setScrollUnit` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                               |
|---------------------|--------------------------------------------------|
| 10                  | (Default) Scroll one pixel per step.             |
| 0-32767             | The desired number of pixels to scroll per step. |

## Scrollbar Display Policy property

Scrollbar display options.

### Runtime modification

This property cannot be changed after the ScrollPane is constructed.

### Settings

| <b>Valid values</b>  | <b>Description</b>                                                                |
|----------------------|-----------------------------------------------------------------------------------|
| SCROLLBARS_AS_NEEDED | (Default) Displays scrollbars if the component doesn't fit entirely in the panel. |
| SCROLLBAR_ALWAYS     | Always displays the scrollbars.                                                   |
| SCROLLBAR_NEVER      | Never displays the scrollbars.                                                    |



## Searchable property

Determine whether the ComboBox is searchable. A searchable ComboBox allows the user to enter text into the text field as long as it matches one of the existing list items. This allows the user to select from a non-editable list by typing instead of dropping-down the list and selecting with the mouse.

### Runtime modification

At run time, use the `setSearchable` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                      |
|---------------------|-------------------------------------------------------------------------|
| true                | Allows the user to enter text to search the ComboBox.                   |
| false               | (Default) The user is not allowed to enter text to search the ComboBox. |



## Selected Index property

Specifies the item in a Choice component that is currently selected. The value is zero-relative.

### Runtime modification

At run time, use the `select` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                                   |
|---------------------|--------------------------------------------------------------------------------------|
| -1                  | (Default) Indicates that none of the list items is currently selected.               |
| 0-32767             | The index of the selected item. The first item in the list has an index of zero (0). |

## Selected RadioButton property

Specifies the index of the selected RadioButton. The value is zero-relative. A -1 indicates no RadioButton is selected.

### Runtime modification

At run time, use the `setSelectedRadioButtonIndex` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                              |
|---------------------|---------------------------------------------------------------------------------|
| -1                  | (Default) Indicates that none of the RadioButtons is currently selected.        |
| 0-32767             | The index of the selected item. The first RadioButton has an index of zero (0). |

## Selection Color property

Specifies the foreground color for the selected element in the component. For example, the selected item on the Calendar component is the day of the month.

### Runtime modification

At run time, use the `setSelectedColor` method to modify this property. For example:

```
calendar1.setSelectedColor(new Color(16711935));
```

### Settings

| Valid values | Description                                     |
|--------------|-------------------------------------------------|
| black        | (Default) Makes the selection foreground black. |
| blue         | Makes the selection foreground blue.            |
| cyan         | Makes the selection foreground cyan.            |
| darkGray     | Makes the selection foreground dark gray.       |
| gray         | Makes the selection foreground gray.            |
| green        | Makes the selection foreground green.           |
| lightGray    | Makes the selection foreground light gray.      |
| magenta      | Makes the selection foreground magenta.         |
| orange       | Makes the selection foreground orange.          |
| pink         | Makes the selection foreground pink.            |
| red          | Makes the selection foreground red.             |
| white        | Makes the selection foreground white.           |
| yellow       | Makes the selection foreground yellow.          |





## Separator property

Determines whether a menu item is a separator. A separator displays as a solid line in the menu and cannot be selected at run time.

### Runtime modification

At run time, use the `addSeparator` method of the MenuItem's parent menu to modify this property, or call the MenuItem's `setLabel` method with the label "-". The label "-" is reserved to display a separator between menu items. If you add a menu item which uses "-" as a Label, it behaves like a menu separator.

### Setting

| <b>Valid values</b> | <b>Description</b>                          |
|---------------------|---------------------------------------------|
| true                | The item is a separator                     |
| false               | (Default) The item is a standard menu item. |

## Shift Offset property

The distance in pixels to shift the animated image after each loop. Each image is shifted horizontally from the previous image by the specified offset. The offset may be positive or negative. If the offset is positive, the first image is drawn on the left side of the component and subsequent images are drawn to the right of the first image by offset pixels. If the offset is negative, the first image is drawn at the right side of the component area. This causes the animated image to appear to move across the container.

### Runtime modification

At run time, use the `setShiftOffset` method to modify this property.

### Settings

| <u>Valid values</u> | <u>Description</u>                                                          |
|---------------------|-----------------------------------------------------------------------------|
| < 0                 | Image is drawn on the right side of the component and moves left.           |
| > 0                 | Image is drawn on the left side of the component and moves right.           |
| 0                   | Image doesn't move.                                                         |
| 10                  | (Default) Image is drawn on the left side of the component and moves right. |



## Show Border property

Specifies whether the border of the component is drawn.

### Runtime modification

At run time, use the `setShowBorder` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                         |
|---------------------|--------------------------------------------|
| true                | (Default) The component's border displays. |
| false               | The component's border does not display.   |



## Show Focus property

Determines whether this component will visually indicate when it has the focus. This is done by drawing a focus rectangle within the component as needed.

### Runtime modification

At run time, use the `setShowFocus` method to modify this property.

### Settings

| Valid values | Description                                                              |
|--------------|--------------------------------------------------------------------------|
| true         | (Default) Visually indicates whether this component has the focus.       |
| false        | Never indicates whether this component has the focus, even when it does. |



## Show Horizontal Scrollbar property

Toggles the display of the component's horizontal scrollbar.

### Runtime modification

At run time, use the `setShowHorizontalScroll` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                   |
|---------------------|------------------------------------------------------|
| true                | The horizontal scrollbar displays.                   |
| false               | (Default) The horizontal scrollbar does not display. |

## Show Link URL Status property

Determines whether the link URL will be displayed in the status area when the mouse is over the button. This flag also controls erasing of the status area after the URL has been displayed.

### Runtime modification

At run time, use the `setShowURLStatus` method to modify this property.

### Settings

| Valid values | Description                                                                       |
|--------------|-----------------------------------------------------------------------------------|
| true         | (Default) Show the link URL in the status area when the mouse is over the button. |
| false        | Do not show the link URL in the status area.                                      |



## Show Progress property

Shows the percentage complete as a number, i.e. 75%.

### Runtime modification

At run time, use the `setShowProgress` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                   |
|---------------------|------------------------------------------------------|
| true                | (Default) The progress percentage string is visible. |
| false               | The progress percentage string is not visible.       |



## Show Vertical Scrollbar property

Toggles the display of the component's vertical scrollbar.

### Runtime modification

At run time, use the `setShowHorizontalScroll` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                 |
|---------------------|----------------------------------------------------|
| true                | The vertical scrollbar displays.                   |
| false               | (Default) The vertical scrollbar does not display. |





## Space property

Specifies the width of the `ToolBarSpacer`, in pixels.

### Runtime modification

At run time, use the `setSpace` method to modify this property.

### Settings


| <b>Valid values</b> | <b>Description</b>                |
|---------------------|-----------------------------------|
| 10                  | (Default)                         |
| integer             | The size of the spacer, in pixels |



## Standard Image property

The URL of the image to display when the mouse is not over the component. If no image is specified the component will be invisible when the mouse is not over it. The image should be in GIF or JPEG format.

To specify the URL:

1. Click in the Standard Image field in the Property List.
2. Click on the  button (or double-click in the field) to display the URL dialog box.
3. Enter the name of the target HTML file.

### Runtime modification

Use the `setStandardURL` method to modify this property.

### Settings

| Valid values | Description                                |
|--------------|--------------------------------------------|
| empty        | (Default)                                  |
| URL          | The URL of a GIF or JPEG image to display. |

## State property

Defines the initial state of the component.

### Runtime modification

At run time, use the `setState` method to modify this property.

### Settings

For most components:

| Valid values | Description                                   |
|--------------|-----------------------------------------------|
| true         | The component has the value: true.            |
| false        | (Default) The component has the value: false. |

For the `StateCheckBox` component:

The [Style property](#) must be set to `THREE_STATE` for the State property to support the third, 'default' setting.

The third state is often used to indicate that an attribute of the current selection varies across the selected items. For example, a checkbox used to indicate "bold text" might use the third state if the currently selected text included both bold and plain characters. It is also used to indicate a default action or state.

| Valid values                 | Description                                                      |
|------------------------------|------------------------------------------------------------------|
| <code>STATE_UNCHECKED</code> | (Default) The checkbox is unchecked.                             |
| <code>STATE_DEFAULT</code>   | Third state of three state check box. Box is grayed and checked. |
| <code>STATE_CHECKED</code>   | The checkbox is checked.                                         |



## Status Text property

Specifies the text that appears in the status bar.

### Runtime modification

At run time, use the `setStatusText` method to modify this property.

### Settings

Any string is valid.

## Status Text Color property

Specifies the color of the text in the status bar.

### Runtime modification

At run time, use the `setStatusTextColor` method to modify this property.

### Settings

| Valid values | Description                            |
|--------------|----------------------------------------|
| black        | (Default) Makes the status text black. |
| blue         | Makes the status text blue.            |
| cyan         | Makes the status text cyan.            |
| darkGray     | Makes the status text dark gray.       |
| gray         | Makes the status text gray.            |
| green        | Makes the status text green.           |
| lightGray    | Makes the status text light gray.      |
| magenta      | Makes the status text magenta.         |
| orange       | Makes the status text orange.          |
| pink         | Makes the status text pink.            |
| red          | Makes the status text red.             |
| white        | Makes the status text white.           |
| yellow       | Makes the status text yellow.          |



## String property

Specifies the text that appears in the StatusScroller message.

### Runtime modification

At run time, use the `setString` method to modify this property.

### Settings

Any string is valid.

## Style property

Sets the border bevel style for the component.

### Runtime modification

At run time, use the `setBevelStyle` method to modify this property.

### Settings

| Valid values  | Description                                                                                                                                                                                  |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BEVEL_LINE    | (Default) Uses a single line border. This provides a "flat" appearance. Flat appearance should be used for a scrollable region or control, such as a drop-down list and drop-down combo box. |
| BEVEL_LOWERED | 3D effect. Makes the component appear lower than the surrounding area. This field style is standard for text boxes, check boxes, spin boxes, and list boxes.                                 |
| BEVEL_NONE    | No border is used.                                                                                                                                                                           |
| BEVEL_RAISED  | 3D effect. Makes the component appear higher than the surrounding area. This window style is used for primary and secondary windows.                                                         |



## Style property (StateCheckBox)

Defines the style of the checkbox.

The Style property must be set to THREE\_STATE for the [State property](#) to support the 'default' setting.

### Runtime modification

At run time, use the `setStyle` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                    |
|---------------------|-------------------------------------------------------|
| TWO_STATE           | (Default) Allows two states, checked and unchecked.   |
| THREE_STATE         | Allows three states, checked, unchecked, and default. |





## Synchronized Mode property

Determines whether sound clips are played one after the other, or all simultaneously.

### Runtime modification

At run time, use the `setSyncMode` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                           |
|---------------------|----------------------------------------------|
| true                | (Default) The sound clips play sequentially. |
| false               | All sound clips play at once.                |



## Tab Labels property

Defines the text strings to use for each tab label in a TabPanel component.

### Runtime modification

At run time, use the `setTabPanelLabels` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                            |
|---------------------|-----------------------------------------------|
| [empty]             | There is no data currently in the component.  |
| [list]              | The component currently has a list of values. |



## Tabs on Bottom property

Specifies if the tabs in a `TabPanel` component display on the bottom or the top of the component.

### Runtime modification

At run time, use the `setTabsOnBottom` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                 |
|---------------------|------------------------------------|
| true                | Tabs display on the bottom.        |
| false               | (Default) Tabs display on the top. |



## Tear Off property

Controls whether the menu can be “torn off” the menu bar.

### Runtime modification

The Tear Off property cannot be changed at runtime. This property is determined at design time.

### Settings

| <b>Valid values</b> | <b>Description</b>                     |
|---------------------|----------------------------------------|
| true                | The user can tear off the menu         |
| false               | (Default) The menu cannot be torn off. |



## **Text property**

Specifies the text that appears in the component.

### **Runtime modification**

At run time, use the `setText` method to modify this property.

### **Settings**

Any string is valid.



## Text Color property

Specifies the color of the associated text.

### Runtime modification

At run time, use the `setTextColor` method to modify this property. For the `ProgressBar`, use the `setProgressBarTextColor` method.

### Settings

| Valid values | Description                     |
|--------------|---------------------------------|
| black        | (Default) Makes the text black. |
| blue         | Makes the text blue.            |
| cyan         | Makes the text cyan.            |
| darkGray     | Makes the text dark gray.       |
| gray         | Makes the text gray.            |
| green        | Makes the text green.           |
| lightGray    | Makes the text light gray.      |
| magenta      | Makes the text magenta.         |
| orange       | Makes the text orange.          |
| pink         | Makes the text pink.            |
| red          | Makes the text red.             |
| white        | Makes the text white.           |
| yellow       | Makes the text yellow.          |



## Tick Frequency property

Used by the Slider component to specify the number of tick marks that display on the component bar. This is the range in value between each tick mark.

### Runtime modification

At run time, use the `setTickFreq` method to modify this property.

| Valid values | Description                                                     |
|--------------|-----------------------------------------------------------------|
| 1            | (Default) Each tick mark corresponds to a change in value of 1. |
| n            | Each tick mark corresponds to a change in value of n.           |



## Tick Style property

Specifies the style of the tick marks that display on the Slider components.

### Runtime modification

At run time, use the `setTickStyle` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                |
|---------------------|---------------------------------------------------|
| TICK_BOTH           | (Default) Tick marks on both the top and bottom.. |
| TICK_BOTTOM         | Tick marks only along the bottom edge.            |
| TICK_NONE           | No tick marks.                                    |
| TICK_TOP            | Tick marks only along the top edge.               |





## **Time (ms) property**

Sets the time to wait before posting an event.

### **Runtime modification**

At run time, use the `setDelay` method to modify this property.

### **Settings**

The valid range is 0 to 32767 milliseconds. The default is 1000.



## **Title property**

Specifies the text to display in the title bar of a container component.

### **Runtime modification**

At run time, use the `setTitle` method to modify this property.

### **Settings**

Any string is valid.



## Unit Increment property

Determines the increment unit for a scrollbar component. This is the amount that is added or subtracted from this scroll bar's Value property when the user presses the up or down scroll arrow.

### Runtime modification

Use the `setUnitIncrement` method to modify this property.

### Settings

| Valid values | Description                         |
|--------------|-------------------------------------|
| 1            | (Default)                           |
| 0-32767      | Valid values are within this range. |




## URL property (general/dbAWARE)

### General

Specifies a pathname in URL format.

### dbAWARE (Visual Café DDE)

The [JdbcConnection component](#) provides dialogs to select and define the URL value for this field. Click the  button in the right margin to display the [URL Select property dialog](#).

In the [Session component](#), this property defines the dbANYWHERE server's URL and port.  
See: [About JDBC URLs](#) for more information about the URL format.



## URL List property

For animators and slide shows, this is a list of URL addresses that refer to GIF or JPEG files comprising an animated sequence. Selecting this property displays a pop-up dialog. Images display in the order that they are placed on the list. The `MoveingAnimation` component displays the URL at a transition speed determined by the `Delay` property, to build an animated image.

For the `SoundPlayer`, this is a list of URL addresses that refer to sound data files. The sound data gets played either serially or simultaneously, depending on the value of the `Synchronized Mode` property.

### Runtime modification

For animators, use the `setImageList` method to modify this property.

For the `SlideShow` component, use the `addImageAndDescription` method.

For the `SoundPlayer` component, use the `addStringURL`, `addURL`, and the `setURLList` methods.

### Settings

A list of valid URL strings.



## Use 3D Border property

Determines whether the border around panels is drawn in a three-dimensional way.

### Runtime modification

Use the `setUse3DBorder` method to modify this property.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                        |
|---------------------|---------------------------------------------------------------------------|
| true                | (Default) The borders around panels are drawn in a three-dimensional way. |
| false               | The borders around panels are not drawn in a three-dimensional way.       |



## Use Offset property

Determines whether the contents of the button will be drawn offset down and to the right by the bevel height amount when the button is drawn in its down state.

### Runtime modification

Use the `setUseOffset` method to modify this property.

### Settings

| Valid values | Description                                            |
|--------------|--------------------------------------------------------|
| true         | Offset objects in button when drawn in its down state. |
| false        | (Default) Don't offset objects in button.              |



## Value property

Sets the position of the thumb in slider, spinner, progress bar and scrollbar components..

### Runtime modification

At run time, use the `setValue` method to modify this property.

For spinners, use the `setCurrent` method to modify this property.

### Settings

The valid range is typically 0 to 32767.





## Vertical Alignment Style property

Specifies the vertical alignment of the text in the component.

### Settings

| <b>Valid values</b> | <b>Description</b>                                                    |
|---------------------|-----------------------------------------------------------------------|
| ALIGN_CENTERED      | (Default) The text is drawn centered vertically within the component. |
| ALIGN_TOP           | The text is drawn at the top of the component.                        |
| ALIGN_BOTTOM        | The text is drawn at the bottom of the component.                     |

## Visible Amount property

The range of values that are displayed at one time. The scrollbar thumb grows to fill the slide as this value approaches the difference between the maximum and minimum values. This makes the scrollbar thumb indicate the size of a page, while the scrollbar slide indicates the size of the entire document.

The scroll bar uses this value when paging up or down by a page.

### Runtime modification

At run time, use the `setVisibleAmount` method to modify this property.

### Settings

| Valid Values | Description                         |
|--------------|-------------------------------------|
| 0            | (Default)                           |
| 0-32767      | Valid values are within this range. |



## Visible property

Controls whether a component is visible at run time or not. When this property is false, the component is invisible. An invisible component cannot be seen by the user nor does it take up space in its container, but it does continue to exist.

All visual components and containers support this property.

### Runtime modification

At run time, you can make components visible or invisible using the `show` or `hide` method.

### Settings

| Valid value | Description                         |
|-------------|-------------------------------------|
| true        | (Default) The component is visible. |
| false       | The component is not visible.       |



## **Visible Rows property**

Specifies the number of rows in the component. That value is used to calculate preferred size for the component when it is laid out. A scrollbar is used when the actual number of rows exceeds this value.

### **Settings**

Any valid integer expression. The default value is 0 (zero).



## Weight X property

This property is a subproperty of [GridBagConstraints](#) . To access this property, set the component's parent container's [Layout property](#) to GridBagLayout.

Specifies how to distribute extra horizontal space for a component within a grid bag layout. The weight of a row is calculated as the maximum *weightx* of all the components in a row. If the resulting layout is smaller vertically than the area it needs to fill, the extra space is distributed to each row in proportion to its weight. A row that has weight 0 receives no extra space. The component does not take any extra space if the [Fill property](#) is set to NONE.

If all the weights are zero, extra space appears between the grids of the cell and the top and bottom edges.

### Runtime modification

At run time, use the `setConstraints` method to modify this property.

### Settings

The default value is 0 (zero). This setting can be any valid `double` expression.



## Weight Y property

This property is a subproperty of [GridBagConstraints](#) . To access this property, set the component's parent container's [Layout property](#) to GridBagLayout.

Specifies how to distribute extra vertical space for components within a grid bag layout. The weight of a column is calculated as the maximum *weighty* of all the components in a row. If the resulting layout is smaller horizontally than the area it needs to fill, the extra space is distributed to each column in proportion to its weight. A column that has weight 0 receives no extra space. The component does not take any extra space if the [Fill property](#) is set to NONE.

If all the weights are zero, extra space appears between the grids of the cell and the right and left edges.

### Runtime modification

At run time, use the `setConstraints` method to modify this property.

### Settings

The default value is 0 (zero). This setting can be any valid `double` expression.



## Wrappable property

Determines whether the spinner value can wrap between its maximum and minimum values.

### Runtime modification

At run time, use the `setWrappable` method to modify this property.

### Settings

| <b>Valid Values</b> | <b>Description</b>               |
|---------------------|----------------------------------|
| false               | (Default) The value cannot wrap. |
| true                | The value can wrap.              |

**About...**



## About JDBC URLs

The JDBC API requires a URL to establish a connection to a database. When attempting to connect to a JDBC driver, the Java program makes a connect call, passing the URL to the driver. If the driver recognizes the information in the URL, including the subprotocol, the connection can be made. The URL is a combination of the JDBC access protocol ("jdbc:") and either the ODBC subprotocol or the dbAW subprotocol. (Each JDBC driver supports certain subprotocols.)

The ODBC subprotocol is the JDBC subprotocol supported by the JDBC-ODBC bridge (a free JDBC driver). The subprotocol is part of this URL syntax:

```
jdbc:odbc://<subname>
```

The dbAW subprotocol is the subprotocol supported by Symantec dbANYWHERE, which is a JDBC driver. The subprotocol is part of this URL syntax:

```
jdbc:dbaw://<host-name-or-IP-address>:<port-number>/<data-source-name>
```

It is common to use the server name "//localhost" while you are developing a project. This indicates that the same machine is running Visual Café DDE and the dbANYWHERE server. The port number :8889 usually works for most environments, and is the default.

## Property Dialogs

## Columns property dialog

Use this property dialog to select the table columns to include in a RecordDefinition.

### Connection

This indicates the JdbcConnection being used to access the database.

### Table

This is a list of available tables in the database. Select the desired table from this list.

### Available

This is a list of columns in the selected table. Choose the column you want to include in the RecordDefinition and press the ">" button to add it to the "Chosen" list. To add all of the columns, press the ">>" button.

### User defined

This allows you to enter any arbitrary column name or expression, not just those in the "Available" list. For example, you could enter the expression "UPPER(name)". After entering the desired text, press the "Add" button to add it to the "Chosen" list.

>>

Adds all of the columns in the "Available" list to the "Chosen" list.

>

Adds the column currently selected in the "Available" list to the "Chosen" list.

<

Removes the column currently selected in the "Chosen" list.

<<

Removes all of the columns in the "Chosen" list.

### Add

Adds the column name in the "User defined" field to the "Chosen" list.

### Chosen

This list determines which columns are part of the RecordDefinition, and the order in which they occur.

### Up

Moves the entry currently selected in the "Chosen" list up one item.

### Down

Moves the entry currently selected in the "Chosen" list down one item.



## Data Binding property dialog

This dialog makes it easy to create a Data Binding name.

### QueryNavigator Alias

If you are using JDBC, then this value is the Alias name of the QueryNavigator from which this component will obtain its data. If you are using dbANYWHERE API then this value is the name of the RelationView object.

### Field Name

This is the name of the database column to get the data from.

### Full Name

This is the full name used for data binding. It is display-only.



## **Filter property dialog**

Use this dialog to enter an expression to constrain the records found during a query.

The expression being built is displayed in the text area at the top of the dialog.

Click on the “Functions”, “Columns”, and “Keywords” list items to insert them into the expression.

To enter operators into the expression, click on an “Operators” button.

The expression may also be manually edited in the usual fashion.



## Lookup Name property dialog

This dialog makes it easy to create a Lookup Name name.

### **QueryNavigator Alias**

If you are using JDBC, then this value is the Alias name of the QueryNavigator from which this component will obtain its data. If you are using dbANYWHERE API then this value is the name of the RelationView object.

### **Field Name**

This is the name of the database column to get the data from.

### **Full Name**

This is the full name used for lookup. It is display-only.

## Sort Order property dialog

This dialog makes it easy to specify record sorting order.

### Available Columns

This is a list of available columns in the RecordDefinition this QueryNavigator uses. Choose the column you want to sort on and press the ">" button to add it to the "Sort Order" list.

### User defined

This allows you to enter any arbitrary column name or expression for sorting, not just those in the "Available Columns" list. For example, you could enter the expression "UPPER(name)". After entering the desired text, press the "Add" button to add it to the "Sort Order" list.

>

Adds the column currently selected in the "Available Columns" list to the "Sort Order" list.

<

Removes the column currently selected in the "Sort Order" list.

<<

Removes all of the columns in the "Sort Order" list.

### Add

Adds the column name in the "User defined" field to the "Sort Order" list.

### Sort Order

This list determines how the records will be sorted. The "Asc/Desc" values determine whether a column will be sorted in ascending or descending order. To change the value, click in the appropriate cell and choose the desired value from the drop-down list.

### Up

Moves the entry currently selected in the "Sort Order" list up one item.

### Down

Moves the entry currently selected in the "Sort Order" list down one item.



## URL Select property dialog

This dialog allows you to enter the URL of the database to use. It also has a drop-down list which for re-selecting a recent URL value. The "Define" button brings up the [URL Define dialog](#). This dialog makes it easy to specify the desired database URL.

See: [About JDBC URLs](#) for more information about the URL format.



## URL Define property dialog

This dialog makes it easy to specify a JDBC URL that conforms to popular JDBC subprotocols.

See: [About JDBC URLs](#) for more information about the URL format.

### SubProtocol

Select the desired subprotocol from the drop-down list, or just type to enter the name of a custom JDBC subprotocol. Choose "dbaw" for Symantec's dANYWHERE, or "odbc" for the JDBC-ODBC bridge. If "odbc" is selected, or if a custom subprotocol is entered, the "SubName" field is enabled. Otherwise the SubName panel is enabled, allowing you to easily build a dbANYWHERE JDBC URL.

### SubName field

For non-dbANYWHERE URLs, enter the URL subname in this field.

### SubName panel

For dbANYWHERE URLs, all the controls in this panel are enabled allowing easy dbANYWHERE JDBC URL specification.

#### dbANYWHERE Server Name

The name of your dbANYWHERE server. Enter the name or select it from the list.

#### Host Name or IP Address

Your dbANYWHERE host name or IP address. It is common to use "localhost" while developing a project. This uses the dbANYWHERE server that's running on your local development machine.

#### Port Number

"8889" usually works for most environments, and is the default.

>>

Pressing this button looks up the available Data Sources from the dbANYWHERE server you have specified. They are listed in the "Data Sources" list.

#### Data Sources

A list of Data Sources available from the dbANYWHERE server. Select the desired Data Source and press the "OK" button.

## **VISUAL Cafe 1.0 and 1.01 online help project**

### **Change history:**

3/10 - removed all windows except for visual and substep, updated files, replaced defin.doc with gloss.doc.

3/11 - added back compo.doc, events.doc, and prop.doc for the Pro release around 3/20.

---

### **See note for building Visual Cafe Pro with this project, below.**

**Do not** add topics to this file. This is the base .doc file for help and is used For project information only.

This project consists of these files:

|               |                                             |
|---------------|---------------------------------------------|
| editors.doc   | Tasks and light overview                    |
| F1_editor.doc | F1 help topic – menus, dialogs, window, etc |
| gloss.doc     | Glossary of terms                           |
| debug.doc     | Debugger tasks and overview                 |
| compo.doc     | Components reference                        |
| events.doc    | Events reference                            |
| props.doc     | Properties reference                        |

This project includes the following:

|             |                                                                                                                                                                                                                                                                                               |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| vcguide.hlp | To allow Alink searches                                                                                                                                                                                                                                                                       |
| alias.txt   | As an alias file. Maps engineering help ID strings to help topic IDs for context-sensitive help                                                                                                                                                                                               |
| helpid.txt  | A file provided by the engineers. Simply update the file exactly as you get it from the engineers. Contains the hex number that the software calls and the help ID that the software thinks that is should look for. Since our topic IDs don't match, that is why we have the alias.txt file. |

New for 1.01

|           |                                                                                       |
|-----------|---------------------------------------------------------------------------------------|
| ctask.doc | Component tasks (generic components only) dbAWARE<br>component tasks are in vcafe.hlp |
|-----------|---------------------------------------------------------------------------------------|

There is a summary topic for each reference doc. Refrain from linking to much to reference .doc files since they change often.

The other piece of the Visual Cafe online help and online document project is the Visual Cafe User's Guide. This project is vcguide.hpj. The online help (vcafe) links to the User's Guide through the User Guide button. The User Guide links to online help through the How To button. To enable this cross .hlp file linking, you must list both files in the Content Tab Composer>>Contents>>Setup...>> Link Files option. The Alinks of other .hlp files don't show up in the A word listing. You have to know the A word and type it in manually.

**WARNING: For this project the Topic ID and A Search Word fields in the Topic definition must**

be EXACTLY the same and only use ONE A Search Word.

Context sensitive help is done by including the engineer's helpid.txt file into the help compile. The mapping between the engineer's ID and the Topic ID is done in an included Alias file called alias.txt.

Other notes:

- since this is a multiple writer project. Everyone should use shared templates robohelp.doc and robotf.dot

### **Building the Visual Cafe Pro help system**

The VC Pro version of vcafe.hlp uses all of the standard .doc files from the VC version, BUT the vcafe.cnt and vcafe.hpj are customized..(Masters are in the Doc source directory | Pro | ComboHelp)

This is because the .cnt current displays the vcafepro.cnt. And, the .hpj has to be modified so that the help window header displays "Visual Cafe Pro Online Help"

To build the vcafe.hlp file for Visual Cafe Pro:

1. Create a directory.
2. Copy in the Visual Cafe vcafe help system files.
3. Copy in the current User Guide (vcguide.hlp and cnt), VC Pro (vcafepro.hlp and cnt)
4. From the source "combohelp" vcafe directory, copy in the vcafe.hpj and vcafe.cnt. Overriding the standard VC version.
5. Compile

\*\*\* We need to sit down and figure out a better way to do this. The problem is that Visual Cafe, and hence Pro, look in "vcafe.hlp" for all F1 topics. To override this the engineers have to hardcode in the name of the help file. Therefore, VC and VCPro have to use the same file name of all UI F1 (we do call vcafepro.hlp for all F1 that is not common to VC.) And the cnt files have to be the same name as the corresponding .hlp (I think, there may be a workaround.)

# Events.doc

8/6/97 Update/check for 1.1

## Event Overview

```
{button Event list,PI('vcafe.hlp','Events_summary')}
```

An event is an asynchronous signal that a source program element sends to target program element to notify the target that some specific behavior has occurred.

### The New 1.1 Event “Delegation” Model

In the Java event delegation model events are sent from a “Source” to “Listener.” A Source is an object that generates events, like an AWT Component. A Listener is any object that implements the appropriate listener interface so that it may receive events. Sources implement standard methods so that a Listener can request that it be notified of events. After a Listener registers with a Source, it gets called anytime an event of the requested type occurs.

There are two general types of events, low-level input (or “window”) events, and semantic events. Listeners may handle low-level events before the component that originated them does. This allows a listener to consume the event so that it never gets handled by the originating component. All low-level events are handled by all components, with the exception of window events which are only handled by Frame and Dialog objects. Semantic events are higher-level events that usually indicate a component has changed its value.

All Java events extend the `java.util.EventObject` class, low-level input events extend the `java.awt.event.InputEvent` class. All Listener interfaces extend the `java.util.EventListener` interface. All Sources implement standard methods of the form `set<EventType>Listener` (where a single listener is allowed), and/or `add<EventType>Listener` (where multiple listeners are allowed). These methods tell a component to notify the listener of events.

### Usage

In Visual Café, you can usually route an event to a target component and specify the action to be taken, via the Interaction Wizard. The Interaction Wizard automatically writes event-related code. It creates new listeners as needed, adds them to the appropriate components, and performs routine event-processing tasks.

### The Old 1.0 Event “Inheritance” Model

The old event inheritance model should not be used for new code. It has been replaced with the new event delegation model. Code that uses the old event model will still run, but should be phased out.

In the old event inheritance model, all components handled events by overriding the component’s `handleEvent` method. Programs that wanted to handle events generated by a component typically either subclassed the component, or handled the event in a parent of that component. Unhandled events eventually pass to the Component class, which discards events it doesn’t recognize.

Java defines the new model events it supports in the `java.awt.Event` class, which extends the `Object` class.

## Event listing

Events fall under the following categories:

### SEMANTIC EVENTS

#### Action Events (java.awt.event.ActionEvent)

[ACTION\\_PERFORMED](#)

#### Adjustment Events (java.awt.event.AdjustmentEvent)

[ADJUSTMENT\\_VALUE\\_CHANGED](#)

#### Item Events (java.awt.event.ItemEvent)

[ITEM\\_STATE\\_CHANGED](#)

#### Text Events (java.awt.event.TextEvent)

[TEXT\\_VALUE\\_CHANGED](#)

### LOW-LEVEL INPUT EVENTS

#### Component Events (java.awt.event.ComponentEvent)

[COMPONENT\\_MOVED](#)      [COMPONENT\\_RESIZED](#)  
[COMPONENT\\_SHOWN](#)      [COMPONENT\\_HIDDEN](#)

#### Container Events (java.awt.event.ContainerEvent)

[COMPONENT\\_ADDED](#)[COMPONENT\\_REMOVED](#)

#### Focus Events (java.awt.event.FocusEvent)

[FOCUS\\_GAINED](#)      [FOCUS\\_LOST](#)

#### Key Events (java.awt.event.KeyEvent)

[KEY\\_PRESSED](#)      [KEY\\_RELEASED](#)  
[KEY\\_TYPED](#)

#### Mouse Events (java.awt.event.MouseEvent)

[MOUSE\\_CLICKED](#)      [MOUSE\\_DRAGGED](#)  
[MOUSE\\_ENTERED](#)      [MOUSE\\_EXITED](#)  
[MOUSE\\_MOVED](#)      [MOUSE\\_PRESSED](#)  
[MOUSE\\_RELEASED](#)

#### Window Events (java.awt.event.WindowEvent)

[WINDOW\\_ACTIVATED](#)[WINDOW\\_CLOSED](#)  
[WINDOW\\_CLOSING](#)      [WINDOW\\_DEACTIVATED](#)  
[WINDOW\\_DEICONIFIED](#)      [WINDOW\\_ICONIFIED](#)  
[WINDOW\\_OPENED](#)

## Events Triggering Database Updates

A data-aware component will automatically update the database when certain triggering events occur. The table below notes which events trigger these updates for which components.

The entries marked with "Default" indicate the default event that the component uses to trigger database updates. The entries marked with "X" indicates events that the component can optionally use as a trigger.

|                           | <u>ACTION</u> | <u>FOCUS_LOST</u> | <u>ITEM</u> | <u>KEY_PRESSED</u> | <u>TEXT</u> |
|---------------------------|---------------|-------------------|-------------|--------------------|-------------|
| <b>CheckBox</b>           |               | X                 | Default     | X                  |             |
| <b>ComboBox</b>           | X             | X                 |             | Default            |             |
| <b>FormattedTextField</b> |               | X                 |             | X                  | Default     |
| <b>ListPlus</b>           | X             | X                 | Default     |                    |             |
| <b>TextArea</b>           |               | X                 |             | X                  | Default     |
| <b>TextField</b>          | X             | X                 |             | X                  | Default     |

## ACTION\_PERFORMED ActionEvent

This semantic event typically indicates some action by the user on a component. They are general purpose signals whose interpretation changes depending on the source of the event.

The user action that causes this event is different for different objects. For example, a check box component's control the action event is triggered when the user clicks the check box, but for a list component, the action event is triggered when the user double-clicks an item in the list.

This table describes what makes common components generate Action Performed events. The Component column contains the component class name. The Command Name column contains the name of the command as retrieved by the ActionEvent's `getActionCommand` method. Command names flagged with a "\*" can be overridden by the user by using that component's `setActionCommand` method. The I.W. Name column contains the name used by the Interaction Wizard for the command. And finally, the User Action column describes how the command typically gets generated.

Standard Java components:

| Component | Command Name | I.W. Name | User Action                                                   |
|-----------|--------------|-----------|---------------------------------------------------------------|
| Button    | * (label)    | Clicked   | User clicked in the Button.                                   |
| List      | (item text)  | DbClicked | User double-clicked on a list item.                           |
| MenuItem  | * (label)    | Action    | User picked a MenuItem.                                       |
| TextField | (field text) | EnterHit  | User pressed the ENTER key while the TextField had the focus. |

Symantec components:

| Component        | Command Name    | I.W. Name    | User Action                                                          |
|------------------|-----------------|--------------|----------------------------------------------------------------------|
| Calendar         | * (null)        | Action       | The selected date changed.                                           |
| ComboBox         | * (null)        | Action       | List item state changed.                                             |
| DirectionButton  | * (null)        | Action       | User pressed the button.                                             |
| HorizontalSlider | * HSliderMoved  | Action       | Slider value changed.                                                |
| ImageButton      | * (null)        | Action       | User pressed the button.                                             |
| ImageListBox     | DoubleClickd    | Action       | List item double-clicked.                                            |
|                  | ImageSelected   | Action       | List item image selected.                                            |
| InvisibleButton  | * ButtonPressed | Action       | User pressed the button.                                             |
| LabelButton      | * (null)        | Action       | User pressed the button.                                             |
| ListPlus         | (item text)     | DbClicked    | User double-clicked on a list item.                                  |
| MultiList        | * RowSelected:n | Action       | Nth row selected, where n is the row's zero-relative index.          |
| RollOverButton   | * (null)        | Action       | User pressed the button.                                             |
| SlideShow        | nextImage       | SlideChanged | The next image has been shown.                                       |
|                  | previousImage   | SlideChanged | The previous image has been shown.                                   |
| Spinner          | ScrollUp        | Action       | Increment button pressed and value incremented.                      |
|                  | ScrollDown      | Action       | Decrement button pressed and value decremented.                      |
| StateCheckBox    | (null)          | Action       | User pressed the checkbox.                                           |
| Timer            | * (null)        |              | Timer delay has expired.                                             |
| TreeView         | (node text)     | Action       | User expanded/collapsed a node, or double-clicked, or pressed ENTER. |
| VerticalSlider   | * VSliderMoved  | Action       | Slider value changed.                                                |

### Listening for the event with code

Listen for this event using an object with the `ActionListener` interface. Register the listener with the event-generating object by using that object's `addActionListener` method. Handle events as they occur in the listener's `actionPerformed` method. Stop listening for this event by using the event-generating object's `removeActionListener` method.



## ADJUSTMENT\_VALUE\_CHANGED AdjustmentEvent

This semantic event is generated when the value of an object that implements the Adjustable interface, like a scrollbar, changes. It indicates the component's value has changed.

To find out why the value changed, use the `getAdjustmentType` method. The value returned indicates what occurred to make the value change. For Scrollbars:

| <b>Adjustment Type</b> | <b>User Action</b>                                                              |
|------------------------|---------------------------------------------------------------------------------|
| BLOCK_DECREMENT        | User "paged" up by clicking in the area between the thumb and the up arrow.     |
| BLOCK_INCREMENT        | User "paged" down by clicking in the area between the thumb and the down arrow. |
| TRACK                  | User selected a specific value by dragging the thumb.                           |
| UNIT_DECREMENT         | User scrolled up one line by clicking the up arrow.                             |
| UNIT_INCREMENT         | User scrolled down one line by clicking the down arrow.                         |

### Listening for the event with code

Listen for this event using an object with the `AdjustmentListener` interface. Register the listener with the event-generating object by using that object's `addAdjustmentListener` method. Handle events as they occur in the listener's `adjustmentValueChanged` method. Stop listening for this event by using the event-generating object's `removeAdjustmentListener` method.



## **COMPONENT\_ADDED ContainerEvent**

This low-level input event is generated when a component is added to a container.

### **Listening for the event with code**

Listen for this event using an object with the `ContainerListener` interface. Register the listener with the event-generating object by using that object's `addContainerListener` method. Handle events as they occur in the listener's `componentAdded` method. Stop listening for this event by using the event-generating object's `removeContainerListener` method.



## **COMPONENT\_MOVED ComponentEvent**

This low-level input event is generated when a component is moved.

### **Listening for the event with code**

Listen for this event using an object with the `ComponentListener` interface. Register the listener with the event-generating object by using that object's `addComponentListener` method. Handle events as they occur in the listener's `componentMoved` method. Stop listening for this event by using the event-generating object's `removeComponentListener` method.



## **COMPONENT\_REMOVED ContainerEvent**

This low-level input event is generated when a component is removed from a container.

### **Listening for the event with code**

Listen for this event using an object with the `ContainerListener` interface. Register the listener with the event-generating object by using that object's `addContainerListener` method. Handle events as they occur in the listener's `componentRemoved` method. Stop listening for this event by using the event-generating object's `removeContainerListener` method.



## **COMPONENT\_RESIZED ComponentEvent**

This low-level input event is generated when a component is resized.

### **Listening for the event with code**

Listen for this event using an object with the `ComponentListener` interface. Register the listener with the event-generating object by using that object's `addComponentListener` method. Handle events as they occur in the listener's `componentResized` method. Stop listening for this event by using the event-generating object's `removeComponentListener` method.



## **COMPONENT\_SHOWN ComponentEvent**

This low-level input event is generated when a component is made visible.

### **Listening for the event with code**

Listen for this event using an object with the `ComponentListener` interface. Register the listener with the event-generating object by using that object's `addComponentListener` method. Handle events as they occur in the listener's `componentShown` method. Stop listening for this event by using the event-generating object's `removeComponentListener` method.



## **COMPONENT\_HIDDEN ComponentEvent**

This low-level input event is generated when a component is made invisible.

### **Listening for the event with code**

Listen for this event using an object with the `ComponentListener` interface. Register the listener with the event-generating object by using that object's `addComponentListener` method. Handle events as they occur in the listener's `componentHidden` method. Stop listening for this event by using the event-generating object's `removeComponentListener` method.



## **FOCUS\_GAINED FocusEvent**

This low-level input event is generated when a component receives the focus. A component receives focus either as the result of user action, like clicking the component, or as a result of executed code, for example the `requestFocus` method. A parent container receives the focus only when all visible controls are disabled.

### **Listening for the event with code**

Listen for this event using an object with the `FocusListener` interface. Register the listener with the event-generating object by using that object's `addFocusListener` method. Handle events as they occur in the listener's `focusGained` method. Stop listening for this event by using the event-generating object's `removeFocusListener` method.





## **FOCUS\_LOST FocusEvent**

This low-level input event is generated when a component loses the input focus.

### **Listening for the event with code**

Listen for this event using an object with the `FocusListener` interface. Register the listener with the event-generating object by using that object's `addFocusListener` method. Handle events as they occur in the listener's `focusLost` method. Stop listening for this event by using the event-generating object's `removeFocusListener` method.

## ITEM\_STATE\_CHANGED ItemEvent

This semantic event is generated when a component item has become either selected or deselected. This event is generated by components: `Checkbox`, `CheckboxMenuItem`, `Choice`, `ImageListBox`, `List`, `MultiList`, and `TreeView`.

To find out why the value changed, use the `ItemEvent`'s `getStateChange` method. The returned value indicates the state change type that caused the event to be generated. A value of `SELECTED` indicates an item is newly selected. A value of `DESELECTED` indicates an item is no longer selected.

### Listening for the event with code

Listen for this event using an object with the `ItemListener` interface. Register the listener with the event-generating object by using that object's `addItemListener` method. Handle events as they occur in the listener's `itemStateChanged` method. Stop listening for this event by using the event-generating object's `removeItemListener` method.



## **KEY\_PRESSED KeyEvent**

This low-level input event is generated when the user presses a key while a component has the focus.

### **Listening for the event with code**

Listen for this event using an object with the `KeyListener` interface. Register the listener with the event-generating object by using that object's `addKeyListener` method. Handle events as they occur in the listener's `keyPressed` method. Stop listening for this event by using the event-generating object's `removeKeyListener` method.



## **KEY\_RELEASED KeyEvent**

This low-level input event is generated when the user releases a key while the component has the focus.

### **Listening for the event with code**

Listen for this event using an object with the `KeyListener` interface. Register the listener with the event-generating object by using that object's `addKeyListener` method. Handle events as they occur in the listener's `keyReleased` method. Stop listening for this event by using the event-generating object's `removeKeyListener` method.



## **KEY\_TYPED KeyEvent**

This low-level input event is generated when a key is typed. This indicates a key has been pressed then released.

### **Listening for the event with code**

Listen for this event using an object with the `KeyListener` interface. Register the listener with the event-generating object by using that object's `addKeyListener` method. Handle events as they occur in the listener's `keyTyped` method. Stop listening for this event by using the event-generating object's `removeKeyListener` method.

## MOUSE\_CLICKED MouseEvent

This low-level input event is generated when the mouse clicks within a component (using the right or left mouse button), or when the SPACE bar is pressed while a button component has the focus.

**Note:** Using the [Action Performed](#) semantic event is the preferred way to trigger an action when a button is clicked. Listen to the Mouse Clicked event to modify and/or consume the event before it reaches the button.

### Listening for the event with code

Listen for this event using an object with the `MouseListener` interface. Register the listener with the event-generating object by using that object's `addMouseListener` method. Handle events as they occur in the listener's `mouseClicked` method. Stop listening for this event by using the event-generating object's `removeMouseListener` method.

## ▶ **MOUSE\_DRAGGED MouseEvent**

This low-level input event is generated when a mouse button is pressed while inside a component, and the mouse then moved while the mouse button is still down. Mouse Drag events are repeatedly generated until the mouse button is released.

### **Listening for the event with code**

Listen for this event using an object with the `MouseEventListener` interface. Register the listener with the event-generating object by using that object's `addMouseListener` method. Handle events as they occur in the listener's `mouseDragged` method. Stop listening for this event by using the event-generating object's `removeMouseListener` method.

## ▶ **MOUSE\_ENTERED MouseEvent**

This low-level input event is generated when the mouse mouse first enters a component.

### **Listening for the event with code**

Listen for this event using an object with the `MouseListener` interface. Register the listener with the event-generating object by using that object's `addMouseListener` method. Handle events as they occur in the listener's `mouseEntered` method. Stop listening for this event by using the event-generating object's `removeMouseListener` method.



## ▶ **MOUSE\_EXITED MouseEvent**

This low-level input event is generated when the mouse exits a component.

### **Listening for the event with code**

Listen for this event using an object with the `MouseListener` interface. Register the listener with the event-generating object by using that object's `addMouseListener` method. Handle events as they occur in the listener's `mouseExited` method. Stop listening for this event by using the event-generating object's `removeMouseListener` method.

## ▶ **MOUSE\_MOVED MouseEvent**

This low-level input event is generated when the user moves the mouse inside a component with the mouse button not pushed.

### **Listening for the event with code**

Listen for this event using an object with the `MouseEvent` interface. Register the listener with the event-generating object by using that object's `addMouseListener` method. Handle events as they occur in the listener's `mouseMoved` method. Stop listening for this event by using the event-generating object's `removeMouseListener` method.

## MOUSE\_PRESSED MouseEvent

This low-level input event is generated when the mouse button is pressed inside this component.

**Note:** Using the [Action Performed](#) semantic event is the preferred way to trigger an action when a button is clicked. Listen to the Mouse Pressed event to modify and/or consume the event before it reaches the button.

### Listening for the event with code

Listen for this event using an object with the `MouseListener` interface. Register the listener with the event-generating object by using that object's `addMouseListener` method. Handle events as they occur in the listener's `mousePressed` method. Stop listening for this event by using the event-generating object's `removeMouseListener` method.

## MOUSE\_RELEASED MouseEvent

This low-level input event is generated when the mouse button is released inside this component.

**Note:** Using the [Action Performed](#) semantic event is the preferred way to trigger an action when a button is clicked. Listen to the Mouse Released event to modify and/or consume the event before it reaches the button.

### Listening for the event with code

Listen for this event using an object with the `MouseListener` interface. Register the listener with the event-generating object by using that object's `addMouseListener` method. Handle events as they occur in the listener's `mouseReleased` method. Stop listening for this event by using the event-generating object's `removeMouseListener` method.



## **TEXT\_VALUE\_CHANGED TextEvent**

This event is generated when the value of a text component changes. This event is generated by components: `TextField` and `TextArea`.

### **Listening for the event with code**

Listen for this event using an object with the `TextListener` interface. Register the listener with the event-generating object by using that object's `addTextListener` method. Handle events as they occur in the listener's `textValueChanged` method. Stop listening for this event by using the event-generating object's `removeTextListener` method.



## **WINDOW\_ACTIVATED WindowEvent**

This event is generated when a window is activated.

### **Listening for the event with code**

Listen for this event using an object with the `WindowListener` interface. Register the listener with the event-generating object by using that object's `addWindowListener` method. Handle events as they occur in the listener's `windowActivated` method. Stop listening for this event by using the event-generating object's `removeWindowListener` method.



## **WINDOW\_CLOSED WindowEvent**

This event is generated after a window has been closed by a call to the window's `hide` or `destroy` method. This event halts processing initiated from window components and releases memory to the Java garbage collector. Program processing is not halted unless the window is the parent window to an application or applet.

### **Listening for the event with code**

Listen for this event using an object with the `WindowListener` interface. Register the listener with the event-generating object by using that object's `addWindowListener` method. Handle events as they occur in the listener's `windowClosed` method. Stop listening for this event by using the event-generating object's `removeWindowListener` method.



## **WINDOW\_CLOSING WindowEvent**

This event is generated when a window's close box is clicked. The listener should explicitly hide or destroy the window in response to this event to close the window.

### **Listening for the event with code**

Listen for this event using an object with the `WindowListener` interface. Register the listener with the event-generating object by using that object's `addWindowListener` method. Handle events as they occur in the listener's `windowClosing` method. Stop listening for this event by using the event-generating object's `removeWindowListener` method.





## **WINDOW\_DEACTIVATED WindowEvent**

This event is generated when a window is deactivated.

### **Listening for the event with code**

Listen for this event using an object with the `WindowListener` interface. Register the listener with the event-generating object by using that object's `addWindowListener` method. Handle events as they occur in the listener's `windowDeactivated` method. Stop listening for this event by using the event-generating object's `removeWindowListener` method.



## **WINDOW\_DEICONIFIED WindowEvent**

This event is generated when the user restores the size of the window from an icon.

### **Listening for the event with code**

Listen for this event using an object with the `WindowListener` interface. Register the listener with the event-generating object by using that object's `addWindowListener` method. Handle events as they occur in the listener's `windowDeiconified` method. Stop listening for this event by using the event-generating object's `removeWindowListener` method.



## **WINDOW\_ICONIFIED WindowEvent**

This event is generated when the user minimizes a window to an icon.

### **Listening for the event with code**

Listen for this event using an object with the `WindowListener` interface. Register the listener with the event-generating object by using that object's `addWindowListener` method. Handle events as they occur in the listener's `windowIconified` method. Stop listening for this event by using the event-generating object's `removeWindowListener` method.



## **WINDOW\_OPENED WindowEvent**

This event is generated when the first time a window is made visible.

### **Listening for the event with code**

Listen for this event using an object with the `WindowListener` interface. Register the listener with the event-generating object by using that object's `addWindowListener` method. Handle events as they occur in the listener's `windowOpened` method. Stop listening for this event by using the event-generating object's `removeWindowListener` method.



\$ The Graphics ClassA The\_Graphics\_Class+ VCGUIDE:0

\$ Animation and MultithreadingA Animation\_and\_Multithreading+ VCGUIDE:0

# Maintaining\_and\_Porting\_Your\_Java\_Applets\_and\_Applications\$ Maintaining and Porting Your Java Applets and ApplicationsK Maintaining;Porting; Java;Applets;Applications;DebuggingA Maintaining\_and\_Porting\_Your\_Java\_Applets\_and\_Applications+ VCGUIDE:0



# Using\_Visual\_Caf\_to\_create\_Java\_Solutions\$ Using Visual Cafe to create Java SolutionsK Using Visual Cafe to create Java Solutions+ VCGUIDE:0Cafe

## **Two-Way tools**

In Visual Cafe, you have the option to use many of the visual tools available, or write your source code. As you use any of the visual tools, the source code is automatically generated and updated for you as you work.

## **.class files**

Are created when you compile your Java program with the Java compiler. For applications, .class files are interpreted by the Java Virtual Machine on each platform, for applets or by a Java-enabled browser.

## **Parent Language**

When a portion of a programming language is taken from a larger language, the original language is called the parent language.

## **Interpreted Language**

Some languages like C and C++ compile programs into instructions for specific machine processors. Other languages, like Java, compile programs into bytecodes, which are non-processor specific. An interpreter, like the Java Virtual Machine, must run on each platform and interpret the bytecode to run the program on that particular platform.

## **The Internet**

The global network of computers.

**platform**

A particular computer or particular operating system, or a combination of both.

## **Web Page**

A Web page is an HTML document that is transmitted over the World Wide Web (WWW.) It can be any combination of text, graphics, animation, and sound. Web pages often contain links to other web pages. Web pages also run applets.



## **Web Browser**

A Web browser is an application that is used to display web pages for the World Wide Web.

**tag**

Used in HTML to indicate how specific pieces of text, sound, and graphics are to be formatted and displayed. Tags are also used to indicate to the Web browser that there is an applet embedded within the code.

**attribute**

Extra information that can used by certain HTML tags.

## **\$ source code**

The list of machine instructions in a particular programming language to be compiled and interpreted or executed.

## **interface**

What a program user sees and uses to interact and accomplish tasks with a particular computer program. A Java interface is a template for assigning certain specified behaviors to classes.

**overhead**

The total amount of resources from the computer that a program needs or uses during its execution.

## **Dynamic-Link Libraries (DLLs)**

A component of Microsoft Windows programs that contain resource files a program uses as needed rather than having these libraries compiled into the program.

## **argument**

Information that is passed to a method. Arguments allow methods to perform their operations on different data making them more versatile.



## **instance**

An component based on a class definition that you use in your programs. An instance is like a variable that represents a class and all it's data and methods. You can have multiple instances of a single class.

## **abstraction**

Removing the unimportant characteristics and details of a component so that only the essential aspects and characteristics remain to describe it.

## **modifier**

Keywords that assign characteristics to various program components like variables, methods, and classes.

## **controls**

Used for accepting and displaying user input and displaying it. Some examples of controls are text boxes, command buttons, and list boxes. Each control has its own set of properties, methods, and events.

## **debugging**

Correcting the logic of your program to get it to run the way you intend.

## **syntax**

The important word order in programming source code.

## **UI**

User Interface. The collection of visual components in a window that collects and displays user input.

## **WYSIWYG**

What You See Is What You Get. Originally, this term came out of the development of word processors from cryptic, command line processing of text to creating documents such that the printed (hard copy) looks exactly like what you see on your monitor.



## **variables**

A symbol, or character, used to represent data.

**expression**

A collection of variables and operators that specify a computation.

## **URL**

An address of a resource on the Internet. (Acronym for Uniform Resource Locator).

## **instantiation**

The act of creating a new instance of a class. This is done using the `new` operator.

## **The CODE Attribute Tag**

Tells the browser the name of the .class file to load and run. Using the CODE tag the browser looks for the .class file in the same directory as the HTML file. If the .class file is in a different directory than the HTML file that displays the applet, you need to also include a CODEBASE attribute that specifies the directory where the .class file is located.

## **The WIDTH Attribute Tag**

Specifies the length (or WIDTH if you prefer) of the display area inside the Web page. If the Length parameter is smaller than the applet, the parts of the applet outside the display area will not be visible.

## **The HEIGHT Attribute Tag**

Specifies the height of the display area inside the Web page. If the height parameter is smaller than the applet, the parts of the applet outside the display area will not be visible.

## **The NAME Attribute Tag**

The name of a parameter the Java applet can request.



## **The VALUE Attribute Tag**

VALUE is the information held by a parameter.

## The `getParameter` Method

The `getParameter` method always returns a text string:

```
String x=getParameter("Color");
```

`Color` is the name of a parameter specified in an HTML document.

## **ToolTip**

When you move the mouse over a component on the Component Palette and pause for a moment, a ToolTip is displayed. ToolTips show a brief one or two word description of the functionality for the active toolbar button or component. The status bar shows a more detailed description of the tool.

## **data**

The information programs operate on.

## **constructor method**

A method with the same name as the class that contains it. Constructors are used to perform initialization operations when an object is first created.

## **encapsulation**

The concept of collecting the data and methods together into a complete object. Encapsulation collects the properties and behaviors into a single independent module that can be reused in multiple programs without modification.

**reusability**

The ability to use the same source code that defines an object in multiple programs without modification.

**extend**

Creating a new object that can use all the data and methods from an existing object. This is also called inheritance.



**Project system, including Project Options dialog and project templates**

## Using Visual Cafe projects

```
{button How
To,AL('Creating_a_Project_howto;Opening_a_Project_howto;Saving_Renaming_Copying_a_Project_howto;Migration_howto;Cl
osing_a_project_howto;Drag_and_Drop_Behavior_Project_overview;Opening_Editors_in_Project_howto;Object_Tab_F1;Packag
e_Tab_F1;Files_Tab_F1;Project_Options_dialog_F1;Defining_Visual_Caf_s_Startup_Mode_howto;Automating_project_backups
_howto;Defining_a_New_Default_Template_howto;Creating_a_Template_howto',0,','')} {button See
Also,AL('Working_with_Templates_overview;Applets_step_overview;Applications_step_overview;Form_Designer_F1;The_Debug
ging_Workspace;Differences_between_Applets_and_Applications;Understanding_Workspaces;Using_Visual_Caf_as_Your_De
velopment_Environment;The_Development_Life_Cycle_A_Two_Step_Process',0,','')}
```

The files needed to create one or more Java [applets](#), [applications](#), or related Web pages containing applets are part of a Visual Cafe *project*. For example, you could place in a project a plane animation applet, a word processing application, or the Web pages and applets that make up an entire Web site.

A project is the starting point of every Java applet and application created in Visual Cafe. The Project window shows each item in a project. Visual Cafe lets you choose how you want to view your project, as a list of [objects](#) and optionally HTML files, a list of [packages](#), or a list of files in a project. Projects provide vital organization to your programs, particularly as they grow more complex.

Before you can construct an applet or application with Visual Cafe, you need to create a new project, specifying one of the predefined [project templates](#). Then the Project window displays with the project name in the title bar. All Java programs created in Visual Cafe *must* be part of a project.

By default, when you first start Visual Cafe, the last project you viewed is opened or a new project is automatically created based on the default project template, Basic Applet.

### Looking at the Objects view

If you click the Objects tab in the Project window, you see the [components](#) in your project and, if they were added to the project, the HTML files. Visual Java components are like C++ controls: they are user interface elements, such as windows, menus, buttons, and so on. Some components can contain other components, such as an application window containing a button; these components are called *containers*. In the Project window, the components in a container appear subordinate to the container, like a file system display. The containers at the top level are separate Java files in your project (called Visual Cafe [forms](#)), while the components in the containers are Java code within the container Java file.

The Objects view is the view many people use most often during Java program development with Visual Cafe. With it, you can keep track of the components your project contains, as well as open a variety of editors. In addition, one way to add the standard Java components and the Visual Cafe components to your project is to drag them from the Component Library or Palette to the Project window. Then an instance of the component class, an object, appears. See [Viewing the components and HTML files in a project](#), [Opening editors from the Project window](#), and [Dragging-and-dropping in the Project window](#) for more information.

### Understanding the objects in the project templates

The following components are in the standard Visual Cafe project templates:

- Basic Applet — An Applet component. The Applet container is a type of Panel component that is designed to appear in an HTML file (such as a Web page) viewed in a Web browser (such as Netscape Navigator).
- Basic Application — A Frame, AboutDialog, and QuitDialog component. The Frame container is a special kind of window; this one has been set up as a main application window. In this template, it contains a menu bar and an Open File dialog, which is a standard Java component. The About and Quit dialogs are Visual Cafe components that you can customize like templates; they are tied to the About and Exit menu items.
- Basic Win32 GUI Application (Professional edition) — The same as basic application, except that the project options are set up to produce a native Win32 executable.
- Basic Win32 Console Application (Professional edition) — A simple console application you can use as a starting point. The project options are set up for you.
- Basic Win32 Dynamic Link Library (Professional edition) — A simple DLL you can use as a starting point. The project options are set up for a DLL.
- Bean Wizard — A wizard that helps you create a basic bean. The wizard creates two files: *beanclassBeanInfo.java* and *beanclass.java*, where *beanclass* is the name of your bean. See [Using the Bean Wizard](#).
- Empty Project — No objects.

You can also create your own project templates that contain the components, Java files, and project options you commonly use. See [Creating a project template](#).

### Looking at the Packages view

A Java *package* is a group of related classes that can be used by programs that import that package or any file in that package.

It is similar to a C library. The Packages view always shows the standard Java packages that Java programs require.

When components are added to a project, a Default Package, containing the **java** files for those objects, appears. If you add a Visual Cafe component, the Symantec package also displays in the Package view; it contains the Java source file for each Visual Cafe component you include (specifically, it contains the source code for the component class that your project object is based on).

You can also make other packages available to Visual Cafe projects by adding them to the Visual Cafe class path. Then if you add an **import** statement or use part of the package in your Java source code, the package appears in the Packages view. See [Adding packages to Visual Cafe](#).

Usually, only advanced Java programmers are interested in this view. See [Viewing the packages in a project](#) for more information.

### Looking at the Files view

The Files view lists all of the files contained in your project. At the top level are the files for the [top-level components](#) in your project, as well as any HTML files or other files you may have added to the project.

In the Imports folder are all of the Java source files for the packages your project uses. Whereas in the Packages view the files are listed by package, in the Imports folder the files are listed alphabetically. In Visual Cafe Professional edition, you can sort in the Files view by clicking a heading button and turn RAD and the resulting automatic code generation on and off for a file.

As with the Packages view, usually only advanced Java programmers are interested in the Files view. See [Viewing the files in a project](#) for more information.

### Changing tab display

You can remove a tab and change the default tab by right-clicking on a tab and choosing an option from the pop-up menu.

### Constructing a logically arranged project directory

The first time you save a project, the files it contains are stored in the directory you specify. For efficient project management, you should store files in a project in a separate directory per project. Doing so will make deploying your applets, applications, and Web pages much easier.

The Java and Symantec packages are automatically available during development with Visual Cafe. These files are not added to your project when you save it the first time; there are a number of ways you can make imports from these packages available to your applets and applications during deployment.

If your project has a lot of files, you can group the files in subdirectories of the project directory. For example, if your project has many graphics files, you could store these files in a separate subdirectory of the project directory. Remember that when you create your Java programs and HTML files, you specify where they should look for certain files, such as graphics files. So whenever you move files in the project directory, you have to be aware of any dependencies that your Java programs and HTML files have on file locations.

For more information on deployment, see [Deploying applets](#) and [Deploying applications](#).

### Looking at the files in the project directory

Visual Cafe creates several files that contain information about your project and stores them in the project directory:

| Extension   | Description                                                                                           |
|-------------|-------------------------------------------------------------------------------------------------------|
| <b>.vpj</b> | The Visual Cafe project                                                                               |
| <b>.vep</b> | Visual Cafe project options and file list                                                             |
| <b>.ve2</b> | Secondary project information                                                                         |
| <b>.cdb</b> | Compiled database that Visual Cafe uses to track compilation dependencies (created after compilation) |

These files are not needed for deployment. The **vep** file name displays in the title bar of the Project window; the rest of the project files do not appear in the Project window.

**Note** In Visual Cafe 1.0, you opened a project by opening the **vpj** file. In Visual Cafe 2.0, you open a project by opening the **vep** file.

Visual Cafe can also create these files and store them in the project directory:

| Extension     | Description                                                                                                                          |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <b>.java</b>  | A Java source file, such as for an applet                                                                                            |
| <b>.class</b> | A compiled version of a Java source file                                                                                             |
| <b>.obj</b>   | An intermediate file produced when you compile a Java source file to create a native Win32 application or DLL (Professional edition) |
| <b>.lib</b>   | A library file used with native Win32 applications and DLLs                                                                          |
| <b>.html</b>  | An HTML file                                                                                                                         |

Double-clicking a Java or HTML file in the Project window opens that file in a Visual Cafe editor. For deployment, you need the compiled version of your Java files (the **class** files) and, for applets, any HTML files you want to use for your Web pages. In addition, you also need your graphics files.

The Java source files and compiled Java files usually have the same file names, but different extensions. You see only the **java** files in the Project window, because they are used for development, while **class** files are used for deployment.

### Adding files to a project

The only way an HTML file will appear in the Project window is if you manually add it. You can add HTML files to the project as a helpful organizational tool, but it is not required.

Although Visual Cafe automatically creates many Java source files for you in its visual environment, in some cases you may want to add Java files directly. For example, if you wanted to import a Java source file for an applet that you created in a product other than Visual Cafe, you could place the file in a project directory, then add the **java** file to the Project window. Visual Cafe will attempt to translate the file into its visual environment.

For more information, see [Adding an existing file to a project](#) and [Adding a new file to a project](#).

### Working with multiple projects and subprojects

You can open multiple projects simultaneously; they are displayed in separate Project windows. This helps you to easily navigate between projects.

You can add the **vep** file of a project to another project. The project you added becomes a subproject of the parent project, which means that the subproject is compiled every time the parent project is. See [Adding a subproject](#) for more information.

### Sharing files across multiple projects

Besides imports, you should not share files containing code that was automatically created with Visual Cafe. If you want to reuse files from previous projects, you have a number of options. For example, you can copy the file into the new project directory and add it to the project, create a new project template tailored to your requirements, add your own custom components to the Component Library, cut and paste Java code, and so on. See [Copying a file in a project](#), [Creating a project template](#), and [Using the Component Library](#).

### Compiling projects

Projects speed development by compiling only the source files that have changed since the last time the project was built. Visual Cafe manages the project for you by automatically analyzing the dependencies of the source files and updating the project information each time you build the project. See [Running a project](#).

### Defining project options

You can customize your project by setting project options such as the project release type, runtime arguments, compiler settings, and search directories. See [Setting project options](#).

## ▶ Creating a new project

```
{button Concepts,AL('Projects_overview',0,'','concept')} {button See  
Also,AL('Closing_a_project_howto;Form_Designer_F1;Project_Options_dialog_F1;Adding_a_new_file_to_the_project_howto;Ad  
ding_Files_to_a_Project_howto;Adding_objects_to_project_howto;Adding_Packages_to_a_Project_howto;Creating_a_Template  
_howto',0,'','visual')}
```

The files needed to create one or more Java applets, applications, or related Web pages containing applets are part of a Visual Cafe project. For example, in a project you could place a plane animation applet, a word processing application, or the Web pages and applets that make up an entire Web site. All Java programs created in Visual Cafe *must* be part of a Visual Cafe project; otherwise, Visual Cafe cannot compile and run them. A project also helps you manage and organize your files as you develop your Java programs.

1. Choose File ▶ New Project.

The New Project dialog box displays.

2. Select the [project template](#) you want as the base for the new project.

The default template is indicated by an asterisk. You can easily change the default template by selecting a template and clicking Set Default.

3. Click OK.

A new Project window opens with the selected template loaded. All objects in the template are added to the project. Only one project displays in a Project window.

4. To save the project, choose File ▶ Save As.

The Save As dialog box displays.

The project and all of the files contained within it should be in the same directory. For easier project management, you should save each project in its own directory.

5. Select a directory and type the project name in the File name field, then click Save.

The Visual Cafe project file must have the extension **vep**. If you type just the first part of the file name, Visual Cafe will add the **vep** extension for you.

6. Set project options as needed.

Often, the defaults provided with your project template are sufficient.

### ▶ [Details on this step](#)

#### Note

- In Visual Cafe 1.0, you opened a project by opening the **vpj** file. In Visual Cafe 2.0, you open a project by opening the **vep** file.
- The first time you save a project, all of the files it contains are saved to the directory you specify. After you save a project once, saving just the project does not save other files, such as applets. Use File ▶ Save All to save all files in a project.



## Opening an existing project

```
{button Concepts,AL('Projects_overview',0,'','concept')} {button See  
Also,AL('Closing_a_project_howto;Creating_a_Project_howto;Converting_cafe_apps_to_VCafe_howto;Importing_VJ+  
+_howto',0,'','visual')}
```

### To open an existing project from within Visual Cafe

1. Choose File ► Open.  
The Open dialog box displays.
2. Navigate to the project directory.
3. Make sure Visual Cafe Project is shown in the Files of type field.  
The projects display.
4. Select a project from the list.
5. Click Open.  
The project opens with the last saved window configuration.

### To open an existing project from the Windows Explorer or another file system window

- Double-click the project file, which has the extension **vep**.

**Note** In Visual Cafe 1.0, you opened a project by opening the **vpj** file. In Visual Cafe 2.0, you open a project by opening the **vep** file.

## ▶ Saving, renaming, copying, and deleting a project

```
{button Concepts,AL('Projects_overview',0,'','concept')} {button See  
Also,AL('Closing_a_project_howto;Opening_a_Project_howto;Creating_a_Project_howto',0,'','visual')}
```

The first time you save a project, all of the files it contains are saved to the directory you specify. After you save a project once, saving just the project saves the project files only, not other files, such as applets. Use File ▶ Save All to save all files within a project.

For efficient project management, you should store the files in a project in a separate directory per project. Doing so will make deploying your applets, applications, and Web pages much easier. If your project has a lot of files, you can group the files in subdirectories of the project directory. For example, if your project has many graphics files, you could store these files in a separate subdirectory of the project directory. Remember that when you create your Java programs and HTML files, you specify where they should look for certain files, such as graphics files. So whenever you move files in the project directory, you have to be aware of any dependencies that your Java programs and HTML files have on file locations.

### To save a project the first time

1. Activate the Project window, then choose File ▶ Save As.

The Save As dialog box displays.

2. Select a directory and type the project name in the File name field.

The Visual Cafe project file must have the extension **vep**. If you type just the first part of the file name, Visual Cafe will add the **vep** extension for you.

**Note** In Visual Cafe 1.0, you opened a project by opening the **vpj** file. In Visual Cafe 2.0, you open a project by opening the **vep** file.

3. Click Save.

The new file name appears in the title bar.

### To save project files only

- Activate the Project window, then choose File ▶ Save.

Only project files are saved, not files in a project, such as applets.

### To save all files in a project

- Activate the Project window, then choose File ▶ Save All.

Project files and files in the project are saved.

### To save one file in a project

After you save a project once, you can save a file within the project separately from other files.

1. Open the file in an editor and activate that window.

#### ▶ Details on this step

Remember that a top-level [container](#) in the Objects view is associated with a Java source file.

2. Choose File ▶ Save.

The Save menu item is enabled only if there are changes to save.

### To save and rename a project

1. Activate the Project window, then choose File ▶ Save As.

The Save As dialog box displays.

2. Type the project name in the File name field, then click Save.

The Visual Cafe project file must have the extension **vep**. If you type just the first part of the file name, Visual Cafe will add the **vep** extension for you.

**Note** In Visual Cafe 1.0, you opened a project by opening the **vpj** file. In Visual Cafe 2.0, you open a project by opening the **vep** file.

3. Using operating system tools, delete from the project directory the project files that have the old name and the extensions **vep**, **vpj**, **ve2**, and **cdb** (if present).

### To copy a project

1. If Visual Cafe is running, make sure that the Project window for the project is closed.  
You cannot copy files while they are in use.
2. From the Windows operating system, copy the files in the project and paste them in a new directory, preserving the directory structure.

If all of your files are in one project directory, you could just copy the project directory, then rename it.

**To delete a project**

1. If Visual Cafe is running, make sure that the Project window for the project is closed.  
You cannot delete files while they are in use.
2. From the Windows operating system, delete the project directory and all files in the project (except for imports).



## Migrating a project from Java version 1.0 to 1.1

```
{button Concepts,AL('Projects_overview',0,',','concept')} {button See  
Also,AL('Opening_a_Project_howto;Creating_a_Project_howto;Saving_Renaming_Copying_a_Project_howto',0,',','visual')}
```

Visual Cafe version 2.0 project files (the **vep**, **vpj**, **ve2**, and **cdb** files) are not backward-compatible with Visual Cafe version 1.0 project files. If you save a 1.0 project in the Visual Cafe 2.0 software, you cannot convert the project back to 1.0. So you might want to copy your 1.0 project directories before opening them in the 2.0 software. That way you will still have your 1.0 project files.

When you open a 1.0 project in Visual Cafe version 2.0, Visual Cafe updates the files to use the new version of the components (specifically, the INIT portion of the code). If you add a Visual Cafe version 1.0 Java file without first opening its 1.0 project, the Java file will not be set up to use the new Visual Cafe components. You should first open the 1.0 project in the newer version of Visual Cafe so that the file is updated for you.

If you want to automatically convert a Java source file from the 1.0 event model to the 1.1 event model, see [Migrating a Java file from the 1.0 to 1.1 event model](#).

### Note

- If you create an applet using JDK 1.1, the Web browser must support this version of the JDK or the applet will not run in the browser.
- In Visual Cafe 1.0, you opened a project by opening the **vpj** file. In Visual Cafe 2.0, you open a project by opening the **vep** file.



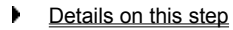
## Adding a subproject

```
{button Concepts,AL('Projects_overview',0,'','concept')} {button See  
Also,AL('Adding_Files_to_a_Project_howto;Closing_a_project_howto;Creating_a_Project_howto;Opening_a_Project_howto;Co  
nverting_cafe_apps_to_VCafe_howto;Importing_VJ++_howto',0,'','visual')}
```

Visual Cafe lets you add subprojects to a project. When you compile the parent project, the subproject gets compiled and saved as well. When you run a project that has subprojects, only the parent project is run. To run and debug a subproject, you need to open the project in its own Project window.

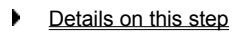
**Note** There is currently no particular order in which subprojects are compiled.

1. Open the project you want to add subprojects to.



[Details on this step](#)

2. Add the **vep** file of a project to the parent project.



[Details on this step](#)

The project you added becomes a subproject of the parent project. It appears in the Files view of the Project window.



## Closing a project

```
{button Concepts,AL('Projects_overview',0,'','concept')} {button See  
Also,AL('Opening_a_Project_howto;Creating_a_Project_howto',0,'','visual')}
```

When a project closes, all windows associated with the project close (except the Property List, which clears).

### To close the active project

- Choose File ► Close while the Project window is active.  
You are prompted to save any unsaved changes. Visual Cafe remains open so you can work on other projects.

### To close all projects and exit Visual Cafe

- Choose File ► Exit.  
You are prompted to save any unsaved changes. The project and Visual Cafe close.

## Dragging-and-dropping into the Project window

```
{button Concepts,AL('Projects_overview',0,'','concept')} {button See  
Also,AL('Opening_a_Project_howto;Creating_a_Project_howto',0,'','visual')}
```

You can use standard graphical user interface (GUI) techniques for dragging and dropping [components](#) and files into the Objects view of the Project window.

When copying or moving components, if a box appears over a [container](#) in the Project window, the component is inserted within the container. If a line appears under a component, the new component appears after the component that is underlined. A + appears over the cursor when a copy operation is being performed.

Containers are placed at the top level or in another container, depending on where you drag the component or on the characteristics of the component. Containers at the top level mean a new **java** file is added to your project; components added to a container mean that code is generated in the **java** file for the top-level container.

Visual Cafe does not allow inappropriate copies and moves, such as dropping a component into a container when that component must be at the top level. While dragging, a circle with a line through it means the operation is not allowed.

| Drag from...                                 | Into...                  | Result...                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Component Library or Palette                 | Project window           | Copies the component to the new project (in other words, instantiates the component).                                                                                                                                                                                                                                                                                                                  |
| Project window                               | Same Project window      | Moves the location of the item. Or press CONTROL and drag an item to copy it. For example, you can move a component to another container or copy a component within the same container. You can also reorder the components in the Project window list, which affects how components overlap on a <a href="#">form</a> (the z-order), the tab order, and the order they are declared in the Java code. |
| Project window                               | Different Project window | Copies the file or component to the new project.                                                                                                                                                                                                                                                                                                                                                       |
| Form Designer                                | Project window           | Within the same project, moves the location of the component; or press CONTROL and drag to copy a component.<br><br>When dragging to a different project, copies the component.                                                                                                                                                                                                                        |
| Menu Designer                                | Project window           | Within the same project, moves the location of the menu item; or press CONTROL and drag to copy a menu item.<br><br>When dragging to a different project, copies the menu item.                                                                                                                                                                                                                        |
| Windows Explorer or other file system window | Project window           | Adds the file to the project. (However, it does not copy the file to the project directory. See <a href="#">Sharing files between projects.</a> )                                                                                                                                                                                                                                                      |

## Opening editors from the Project window

```
{button Concepts,AL('Projects_overview',0,'','concept')} {button See  
Also,AL('Opening_a_Project_howto;Creating_a_Project_howto',0,'','visual')}
```

The Project window helps you to quickly edit the items in a project.

To access other editor windows from the Project window:

| <b>Double-click...</b>    | <b>To get this editor...</b> |
|---------------------------|------------------------------|
| <a href="#">component</a> | Form Designer                |
| menu                      | Menu Designer                |
| Java or HTML file         | Source window                |

Components and menus are displayed in the Objects view.

Java files are displayed in the Packages and Files view.

HTML files are displayed in the Objects and Files view. If you have installed Visual Page from the Visual Cafe CD, double-clicking an HTML file in the Objects view launches Visual Page.

## Viewing the components and HTML files in a project

```
{button Concepts,AL('Projects_overview;GUI_development_with_Visual_Caf,0','','concept')} {button See  
Also,AL('Opening_a_Project_howto;Creating_a_Project_howto;Opening_Editors_in_Project_howto;Copying_a_component_how  
to;Drag_and_Drop_Behavior_FormD_overview;Property_Inspector_using_F1;Designing_and_Building_GUIs_with_Visual_Caf,0  
','','visual')}
```

The Objects view of the Project window shows the [components](#) in your project and, if they were added to the project, the HTML files. The components in a [container](#) appear subordinate to the container, like a file system display. The containers at the top level are separate Java files in your project, while the components in the containers are Java code within the container Java file. The Objects view is the view many people use most often during Java program development with Visual Cafe.

### To look at Objects view

- Click the Objects tab in the Project window.

Following are some tasks you can perform with components in the Objects view:

[Adding a component to a project](#)

[Copying a component in a project](#)

[Renaming a component in a project](#)

[Deleting a component from a project](#)

[Dragging-and-dropping in the Project window](#)

[Creating a component interaction](#)

Following are some tasks you can perform with files in the Objects view:

[Adding a new file to a project](#)

[Adding an existing file to a project](#)

[Deleting a file from a project](#)

[Copying a file in a project](#)

[Sharing files between projects](#)

[Running a project](#)

## Viewing the packages in a project

```
{button Concepts,AL('Projects_overview',0,'','concept')} {button How  
To,AL('Adding_objects_to_project_howto;Opening_Editors_in_Project_howt;Renaming_an_Object_howto',0,'','visual')}
```

The Packages view lists the Java source files, grouped as Java [packages](#), in your project. The Packages view always shows the standard Java packages that Java programs require. When components are added to a project, a Default Package, containing the **java** files for those objects, appears. If you add a Visual Cafe component, the Symantec package also displays in the Package view; it contains the Java source file for each Visual Cafe component you include.

You can also make other packages available to Visual Cafe projects by adding them to the Visual Cafe class path. See [Adding packages to Visual Cafe](#).

Usually, only advanced Java programmers are interested in the Packages view.

### To look at Packages view

- Click the Packages tab in the Project window.

You can expand and collapse a package like you would for a Windows file system.

**Note** Classes that have not been added to a package display under the Default Package. Only source files that have been added to the project are listed.

Following are some tasks you can perform with files and packages in the Packages view:

[Adding a new file to a project](#)

[Adding an existing file to a project](#)

[Deleting a file from a project](#)

[Copying a file in a project](#)

[Sharing files between projects](#)

[Adding packages to Visual Cafe](#)

[Using the Class Wizard](#)

[Running a project](#)

## Viewing the files in a project

```
{button Concepts,AL('Projects_overview',0,'','concept')} {button How  
To,AL('Adding_objects_to_project_howto;Adding_Packages_to_Visual_Cafe_how_to;Opening_Editors_in_Project_howto;Rena  
ming_an_Object_howto',0,'','visual')}
```

The Files view lists all of the files contained in your project. At the top level are the files for the components in your project, as well as any HTML files you may have added to the project.

In the Imports folder are all of the Java source files for the packages your project uses. Whereas in the Packages view the files are listed by package (see [Viewing the packages in a project](#)), in the Imports folder the files are listed alphabetically.

In Visual Cafe Professional edition, you can sort files in the Files view by clicking a heading button and turn and the resulting automatic code generation on and off for a file.

HTML files are also listed in the Objects view (see [Viewing the components and HTML files in a project](#)).

Usually, only advanced Java programmers are interested in the Files and Packages view.

### To look at Files view

- Click the Files tab in the Project window.

**Note** If a file with the extension **java** appears, the corresponding **class** file is not listed, because you are interested in **java** files during development.

Following are some tasks you can perform with files in the Project window:

[Adding a new file to a project](#)

[Adding an existing file to a project](#)

[Sorting files in the Files view](#)

[Deleting a file from a project](#)

[Copying a file in a project](#)

[Sharing files between projects](#)

[Running a project](#)

[Enabling and disabling RAD and automatic code generation](#)



## Adding a component to a project

```
{button Concepts,AL(^Projects_overview;Insert_Menu_F1;GUI_development_with_Visual_Caf,0,','')} {button See  
Also,AL(^Adding_a_Menu_to_a_Form_howto;Adding_Files_to_a_Project_howto;Adding_a_Dialog_howto;Forms_adding_objects  
;Drag_and_Drop_Behavior_Project_overview;Designing_and_Building_GUIs_with_Visual_Caf,0,','')}
```

Visual Cafe provides several ways to add components to your project. When components are added directly to a [form](#) in the Form Designer, they are also added to the associated project.

### To add a component by using drag-and-drop

You can drag a component from the following areas into the Project window, Form Designer, or Menu Designer:

- the Component Palette or Library
- a Project window or Form Designer of the same project (press CONTROL and drag to copy the component)
- a Project window or Form Designer of a different project

**Note** When you copy a component within the same or a different project, only component code that is automatically generated by Visual Cafe is copied. This does not include [custom code](#) and [interactions](#).

### To add a component by using an Insert menu item

- While the Project window or Form Designer is active, choose a menu item from the Insert menu to add components to your project.
- Right-click the Project window and choose an Insert menu item.

The component is added to the container that is currently selected in the Project window.

**Note** If the parse fails, you can see a file in the Packages and Files view, but not see an object in the Objects view of the Project window. You probably need to correct the Java code to get the file to parse. See [Adding code to a Java source file](#) for more information.

## Copying a component in a project

```
{button Concepts,AL('Projects_overview',0,',';concept')} {button See  
Also,AL('Adding_objects_to_project_howto;Deleting_Objects_from_a_Project_howto',0,',';visual')}
```

You can copy and paste a component listed in the Objects view of the Project window from one project to another, or within the same project:

- If you copy and paste a top-level [container](#), the corresponding Java file is duplicated and placed in the target project directory.
- If you copy and paste a component in a container, the Java code of that component is placed in the Java file of the top-level container. Only component code that is automatically generated by Visual Cafe is placed in the Java file. This does not include [custom code](#) and [interactions](#).

You can copy components between the Project window (Objects tab), Form Designer, and Menu Designer as needed.

Visual Cafe only allows appropriate copies; for example, a component that is not a container cannot be copied to the top level. While dragging, a circle with a line through it means the operation is not allowed.

### To copy and paste a component

1. Open the project(s) you want to use.
2. Click the Objects tab in the Project window, or open the Form Designer or Menu Designer, then select the component that you want to copy.
3. Choose Edit ► Copy, right-click and choose Copy, or click the toolbar Copy button.
4. If you want to paste the component within another container, select that container.
5. While the target Project window (Object tab), Form Designer, or Menu Designer is active, choose Edit ► Paste, right-click and choose Paste, or click the toolbar Paste button.

The component appears in the Project window. If needed, the component is renamed to prevent name conflicts.

### To copy and drag a component

- Within the same project, press CONTROL and drag the component to the location you want it.
- To a different project, drag the component to the location you want it.



## Renaming a component in a project

```
{button Concepts,AL('Projects_overview',0,'','concept')} {button See  
Also,AL('Adding_objects_to_project_howto;Forms_adding_objects;Property_Inspector_using_F1',0,'','visual')}
```

You can rename the components listed in the Objects view of a project. If you rename a top-level [container](#), the corresponding Java file name changes. If you rename a component in a container, the Java code of the top-level container changes for that component. Visual Cafe changes the name in the entire Java source file, even in [custom code](#).

### To rename a component from the Project window

- Click the Objects tab in the Project window, select the component name, press TAB, and retype the name in the edit frame. Press ENTER or click somewhere else when you are finished.
- Click the Objects tab in the Project window, slow double-click the component name and type the new name in the edit frame. Press ENTER or click somewhere else when you are finished.

### To rename a component from the Property List

- Make your project active, then change the Name property of the component in the Property List.

## ▶ Deleting a component from a project

```
{button Concepts,AL('Projects_overview',0,'','concept')} {button See Also,AL('Adding_objects_to_project_howto',0,'','visual')}
```

If you delete a top-level container in the Objects view of the Project window, the corresponding **java** file is deleted from the project and the other views. The file is not deleted from the directory on your hard disk.

**Note** If you want to delete a file, you should first delete it from the project then delete it using Windows operating system commands. Do not delete a file using operating system commands before first deleting it from the project.

If you delete a component within a container, the code automatically generated by Visual Cafe is deleted. You must manually delete any [custom code](#), [interactions](#), and [event bindings](#); see [Deleting an interaction](#) for more information.

If you delete a component's code from a Java file, the component is removed from the Project window after you click out of the Source window or save the Java file.

**Note** To avoid deleting the wrong code or not all of the code, it is recommended that you delete components from the Project window instead of from the source code. Then delete from the source code any custom code or interactions.

### **To delete components from the Project window (Objects tab), Form Designer, or Menu Designer**

- Select the component and press DELETE or choose Edit ▶ Delete.

If you delete a component from a container, you must manually delete any custom code, interactions, and event bindings involving that component.

If the component is a top-level container, the corresponding Java file is not deleted from the directory on the hard disk. You must manually delete it.



## Adding a new file to a project

```
{button Concepts,AL('Projects_overview',0,'','concept')} {button See  
Also,AL('Adding_Files_to_a_Project_howto;Deleting_Files_from_a_Project_howto',0,'','visual')}
```

Visual Cafe lets you create a new text file from within its environment. You can add HTML code to create HTML files and Java code to create Java source code files; you can add these files to your project.

1. Choose File ► New File.  
An empty Source window displays.
2. Choose File ► Save As.
3. In the Save As dialog box, type the file name (including the appropriate extension) and select the Add to Project option.
4. Optionally select or deselect Enable RAD.  
For more information, see [Enabling and disabling RAD and automatic code generation](#).
5. Click Save.  
The file name appears in the title bar.
6. In the Source window, add appropriate code or text.

## Adding an existing file to a project

```
{button Concepts,AL('Projects_overview',0,'','concept')} {button See  
Also,AL('Adding_a_new_file_to_the_project_howto;Deleting_Files_from_a_Project_howto',0,'','visual')}
```

You can add HTML, Java, and **vep** project files to a project.

The only way an HTML file will appear in the Project window is if you manually add it. You can add HTML files to the project as a helpful organizational tool, but it is not required.

You can also add Java source files (with the extension **java**). For example, if you wanted to import a Java source file for an applet that you created in a product other than Visual Cafe, you could place the file in a project directory, then add the **java** file to the Project window. Visual Cafe will attempt to translate the file into its visual environment.

**Note** If you add a Visual Cafe version 1.0 Java file without first opening its 1.0 project, the Java file will not be set up to use the new Visual Cafe components (specifically, the INIT portion of the code). You should first open the 1.0 project in the newer version of Visual Cafe so that the file is updated for you.

If you add the **vep** file of a project to a project, that project becomes a subproject of the project it resides in.

Remember that it is recommended that you store the files in a project in a separate directory per project. Doing so will make deploying your applets, applications, and Web pages much easier. You should also avoid sharing files between projects. See [Sharing files between projects](#) for more information.

**Note** File names are relative to the current project. For example, if you add a file called foo.java and it resides in a subdirectory (called foo1) of the project directory, the file name is stored as foo1\foo.java and is not fully qualified. If foo1 was a directory at the same level as the project directory, the file would be stored as ../foo1\foo.java.

### To add files from the Visual Cafe environment

1. Choose Insert ► Files into Project.  
The Project Files dialog box displays.
2. Select the file(s) that you want to add.
3. Click Add or Add All, as appropriate.
4. Click OK.  
The file(s) appear in the Project window.

### To add files from the Windows Explorer or other file system window

- Drag Java or HTML files from the Explorer into the Project window.

### To add files from the Find in Files dialog box

You can easily add a large subdirectory to your project using this technique.

1. Choose Search ► Find in Files.
2. Specify a directory.
3. Click Find.
4. Right-click on the window with the list of files. Then choose Add All to Project.



## Sorting files in the Files view

```
{button Concepts,AL('Projects_overview',0,'','concept')} {button See  
Also,AL('Adding_a_new_file_to_the_project_howto;Deleting_Files_from_a_Project_howto',0,'','visual')}
```

In Visual Cafe Professional edition, you can sort files in the Files view of the Project window by clicking a heading button.



## Deleting a file from a project

```
{button Concepts,AL('Projects_overview',0,'','concept')} {button See  
Also,AL('Adding_a_new_file_to_the_project_howto;Adding_Files_to_a_Project_howto',0,'','visual')}
```

As you are developing your project, you can delete HTML and Java source files as needed.

### To remove a file by pressing DELETE

- In the Files view of the Project window, select a file and press DELETE.

### To remove files by using the Project Files dialog box

1. Make the Project window active.
2. In the Packages or Files view, right-click the window to display the pop-up menu, then choose Insert/Remove Files.  
Or while any view is displayed, choose Insert ► Files into Project.
3. In the Project Files dialog box, select one or more files from the list at the bottom pane of the dialog box.
4. Click Remove.
5. Click OK.

### Note

- When you remove a Java source file from a project, all associated visual elements that are created in the Java code are also removed.
- Deleting a file from a project does not delete it from the project directory. You must manually delete it.
- You cannot remove imported files.





## Copying a file in a project

```
{button Concepts,AL('Projects_overview',0,',';concept')} {button See  
Also,AL('Adding_a_new_file_to_the_project_howto;Adding_Files_to_a_Project_howto;Deleting_Files_from_a_Project_howto',0,`  
';visual')}
```

You can copy and paste a file from one project to another, or within the same project. The file is duplicated and placed in the target project directory.

1. Open the project(s) you want to use and click the Packages or Files tab.
2. In the Project window, select the file that you want to copy.
3. Choose Edit ▶ Copy or click the toolbar Copy button.
4. Activate the Project window that you are copying the file to.
5. Choose Edit ▶ Paste or click the toolbar Paste button.

The file appears in the Project window. If you are pasting into the same project that you copied the file from, the file is renamed to prevent file name conflicts.

## Sharing files between projects

{button How

To,AL('Copying\_a\_Project\_File\_howto;Adding\_Files\_to\_a\_Project\_howto;Adding\_a\_new\_file\_to\_the\_project\_howto;Adding\_Be  
an\_to\_Library\_howto',0,'')} {button See Also,AL('Projects\_overview',0,'')}

For efficient project management, it is recommended that you store the files in a project in a separate directory per project. Doing so will make deploying your applets, applications, and Web pages much easier.

You can reuse a file if it does not have code generated by Visual Cafe. Just add the file to the other project. For more information, see [Adding an existing file to a project](#).

Any file that contains code that was automatically generated by Visual Cafe should not be shared between multiple projects. The file can change in one project, causing version problems in any other projects it belongs to. Instead, you have a number of options. For example, you can copy the file into the new project directory and add it to the project, create a new project template tailored to your requirements, add your own custom components to the Component Library, cut and paste Java code, and so on. For more information, see [Copying a file in a project](#), [Creating a project template](#), and [Using the Component Library](#).

**Note** File names are relative to the current project. For example, if you add a file called foo.java and it resides in a subdirectory (called foo1) of the project directory, the file name is stored as foo1\foo.java and is not fully qualified. If foo1 was a directory at the same level as the project directory, the file would be stored as ../foo1\foo.java.

## Adding packages to Visual Cafe

```
{button Concepts,AL('Projects_overview',0,'','concept')} {button See  
Also,AL('Package_Tab_F1;Insert_class_dialog_F1;Adding_Bean_to_Library_howto',0,'','visual')}
```

The standard Java packages and the Symantec Visual Cafe packages are available to you as you create Java programs in the Visual Cafe environment. You can also make other packages available to Visual Cafe projects by adding them to the Visual Cafe class path. For example, you could add third-party or your own packages containing components or utilities. You can set the class path for a project or for the Visual Cafe environment. See [Specifying file search paths and the output directory](#) for more information.

Remember to keep the directory structure of your package intact, and make sure that your file names use the same uppercase and lowercase letters, exactly as they were before copying the package.

If you add a Java **import** statement or use part of the new package in your Java source code, the package appears in the Packages view.

## Project Options dialog

## Setting project options

```
{button Concepts,AL('Projects_overview',0,',';concept')} {button See  
Also,AL('Environment_Options_Dialog_F1;Automating_project_backups_howto;Defining_Visual_Caf_s_Startup_Mode_howto',0,  
',';visual')}
```

In the Project Options dialog box, Visual Cafe lets you perform the following tasks to set options that apply to a single project:

- [Specifying whether builds are debug or final](#)
- [Setting the project type to applet or application](#)
- [Specifying what applets to run and the HTML file](#)
- [Making applets run in the Applet Viewer or a browser](#)
- [Specifying the main class to run for an application](#)
- [Specifying the name of a native application or DLL](#)
- [Setting the working directory for a native program](#)
- [Specifying a program for running and debugging a DLL](#)
- [Specifying arguments for application execution](#)
- [Specifying whether to parse imports](#)
- [Enabling and disabling RAD and automatic code generation](#)
- [Specifying whether to clear messages before builds](#)
- [Setting compiler options for a project](#)
- [Specifying the exports of a DLL or native application](#)
- [Specifying libraries to link into your native program](#)
- [Specifying file search paths and the output directory](#)
- [Using version control](#)
- [Setting debugger options for a project](#)

### Note

- Most changes made in this dialog box do not take effect until the next time they are needed. For example, if you change runtime arguments, they do not take effect until the next time you run your Java application.
- To set global options that affect all projects, use the Environment Options dialog box.

### To set project options

1. Activate the Project window of the project you want to work with.
2. Choose Project ► Options.

### To set environment options

- Choose Tools ► Environment Options.

## Defining general project and runtime options

```
{button Concepts,AL('Projects_overview;The_Differences_between_Applets_and_Applications',0,','concept')} {button See  
Also,AL('F1_Messages_Window;Debugging Your Program;Running_a_Project_howto;Project_Options_dialog_F1',0,','visual')}
```

From the Project tab of the Project Options dialog box, you can perform the following tasks:

[Specifying whether builds are debug or final](#)

[Setting the project type to applet, application, or DLL](#)

[Specifying what applets to run and the HTML file](#)

[Making applets run in the Applet Viewer or a browser](#)

[Specifying the main class to run for an application](#)

[Specifying the name of a native application or DLL](#)

[Setting the working directory for a native program](#)

[Specifying a program for running and debugging a DLL](#)

[Specifying arguments for application execution](#)

[Specifying whether to parse imports](#)

[Enabling and disabling RAD and automatic code generation](#)

[Specifying whether to clear messages before builds](#)

## Specifying whether compiles are debug or final

```
{button Concepts,AL('Projects_overview;The_Differences_between_Applets_and_Applications',0,',';concept')} {button See  
Also,AL('Project_Options_dialog_F1;F1_Messages_Window;Debugging Your Program;Running_a_Project_howto',0,',';visual')}
```

Visual Cafe has Debug and Final project option sets that let you specify how you want to compile your Java code. By default, for Debug the compiler includes debug information, while for Final no debug information is included and Java optimizations for speed and compactness are performed. Debug information enables you to use all Visual Cafe debug features when you debug your Java programs, but makes the compiled code larger.

In the Project Options dialog box, the Compiler and Directories tabs show the release type option sets. For more information on the options, see [Setting compiler options for a project](#) and [Specifying file search paths and output directories](#).

### To set the release type

1. Activate the Project window of the project you want to work with.
2. Choose Project ► Options.
3. In the Project Options dialog box, click the Project tab.
4. Select one of the following options:

| Select... | To do this...                                                                                        |
|-----------|------------------------------------------------------------------------------------------------------|
| Debug     | By default, build an executable that contains debugging information.                                 |
| Final     | By default, build a more compact executable that is optimized and contains no debugging information. |

You can change the default, as described in the next procedure.

5. Click OK.  
The change takes effect the next time you compile your Java program.

### To change a release type option set

1. From the Project Options dialog box, set the release type to Debug or Final.
2. Click the Compiler and Directories tabs and set the options for that release type.
3. Click OK.  
The change takes effect the next time you compile your Java program.

## Setting the project type to applet, application, or DLL

```
{button  
Concepts,AL('Projects_overview;The_Differences_between_Applets_and_Applications;Java_HTML_and_Visual_Caf',0,'','conce  
pt')} {button See  
Also,AL('Project_Options_dialog_F1;Running_a_Project_howto;;Adding_an_Applet_to_an_HTML_page_howto;Viewing_HTML_  
Files_howto',0,'','visual')}
```

1. Activate the Project window of the project you want to work with.
2. Choose Project ► Options.
3. In the Project Options dialog box, click the Project tab.
4. Select one of the following options:

| Select...                                | To specify this...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Applet                                   | <p>The project is an applet.</p> <p>When you run a project, the <b>Start with Web page</b> setting determines which HTML file is used. The HTML file determines which applets are run. See <a href="#">Specifying what applets to run and the HTML file</a>.</p> <p>To specify that your applets should run in your default Web browser, select the <b>Execute applet in default Web browser</b> option. Deselect it if you want to run applets in the Applet Viewer associated with the Visual Cafe environment. For more information, see <a href="#">Making applets run in the Applet Viewer or a browser</a>.</p> |
| Application                              | <p>The project is a standalone application.</p> <p>To run the application from Visual Cafe, the main class must also be specified. See <a href="#">Specifying the main class to run for an application</a>.</p>                                                                                                                                                                                                                                                                                                                                                                                                       |
| Win32 Application (Professional edition) | <p>The project is a native, standalone executable.</p> <p>To run the application from Visual Cafe, the main class must also be specified. See <a href="#">Specifying the main class to run for an application</a>.</p> <p>You can also set the application name, which is by default the project name appended with the <b>exe</b> extension. See <a href="#">Specifying the name of a native application or DLL</a>.</p> <p>If you want to run your executable from a different directory than where it is located, see <a href="#">Setting the working directory for a native program</a>.</p>                      |
| Win32 DLL (Professional edition)         | <p>The project is a native Dynamic Link Library (DLL).</p> <p>You can specify the program to use to run and debug the DLL. See <a href="#">Specifying a program for running and debugging a DLL</a>.</p> <p>You can also set the library name, which is by default the project name appended with the appropriate extension. See <a href="#">Specifying the name of a native application or DLL</a>.</p> <p>If you want to run the calling program from a different directory than where it is located, see <a href="#">Setting the working directory for a native program</a>.</p>                                   |



5. Click OK.

The change takes effect the next time you run your project.

## Specifying what applets to run and the HTML file

```
{button
Concepts,AL(^Projects_overview;The_Differences_between_Applets_and_Applications;Java_HTML_and_Visual_Caf;HTML_and
_Visual_Cafe_overview',0,';')} {button See
Also,AL(^Project_Options_dialog_F1;Running_a_Project_howto;Adding_an_Applet_to_an_HTML_page_howto;Viewing_HTML_
Files_howto',0,';')}
```

An applet is launched from an HTML file that has an applet tag. Visual Cafe can automatically create an HTML file with applet tags for all the applets in your project. When you run your project from Visual Cafe, you can specify what HTML file to use to display your applets. Here are some scenarios:

- If you run your project with the automatically generated HTML file in the Applet Viewer, all of your applets appear in separate windows.
- If you run your project with the automatically generated HTML file in a Web browser, all of your applets appear in an otherwise blank browser window.
- If you run your project with your own HTML file in the Applet Viewer, each applet that has an applet tag will appear in a separate window.
- If you run your project with your own HTML file in a Web browser, the HTML file appears in a browser window, including the applets as specified in the file.

If you want to test the files for a Web site, you could specify the home page as the starter HTML and run the page from a Web browser. Then you could access the other pages from this page to make sure your applets work.

1. Activate the Project window of the project you want to work with.
2. Choose Project ► Options.
3. In the Project Options dialog box, click the Project tab.
4. Specify an HTML file in one of these ways:
  - Choose (Automatic) to run all of the applets from an automatically generated HTML file that is blank.
  - Choose one of your own HTML files from the pop-up menu. HTML files that you added to your project automatically appear in the pop-up menu.
  - Click ... to browse for an HTML file.
  - Type in the field to specify a file name or a URL, for example, <http://myserver.someplac.com/somedirectory/some.htm>.
5. Click OK.

The change takes effect the next time you run your project.



## Making applets run in the Applet Viewer or a browser

```
{button  
Concepts,AL('Projects_overview;The_Differences_between_Applets_and_Applications;Java_HTML_and_Visual_Caf;HTML_and  
_Visual_Cafe_overview',0,'','concept')} {button See  
Also,AL('Project_Options_dialog_F1;Running_a_Project_howto;Adding_an_Applet_to_an_HTML_page_howto;Viewing_HTML_  
Files_howto',0,'','visual')}
```

When running applets from Visual Cafe, you can launch your applets in the Applet Viewer associated with the Visual Cafe environment or in the Web browser of your choice. The Web browser must be set up to be the default Web browser for your computer.

Running applets in the Applet Viewer can be faster, because the browser does not have to start up. However, it is a good idea to test your applets in popular browsers before deployment.

**Note** When you run an applet in the debugger, it runs in the Applet Viewer.

1. Activate the Project window of the project you want to work with.
2. Choose Project ► Options.
3. In the Project Options dialog box, click the Project tab.
4. Select Applet, if needed, then select Execute applet in default HTML viewer if you want to run the applet in a browser or deselect it if you want to run the applet in the Applet Viewer.
5. Click OK.

The change takes effect the next time you run your project.

**Tip** When this option is selected, Visual Cafe looks for the application you have associated with the file extensions **htm** and **html** (Hypertext Document file type). If an association does not exist, you must define one. On Windows NT 3.x, you set file associations in File Manager ► File

► Associate; on Windows 95 and Windows NT 4.0 and higher, from a Windows file system window (such as the Explorer), choose View

► Options

► File Types tab to set the association, including the **open** action. A browser might have already set the association for you, for example, the file type Netscape Hypertext Document.

## Specifying the main class to run for an application

```
{button Concepts,AL('Projects_overview;The_Differences_between_Applets_and_Applications',0,'','concept')} {button See  
Also,AL('Project_Options_dialog_F1;Running_a_Project_howto',0,'','visual')}
```

To run an application from within the Visual Cafe environment, you must specify the starting point of your application (the Java class file containing the **main** method) so Visual Cafe knows how to run your application. If you started a project with the Basic Application template or inserted a Java file that already had a **main** method in it, the main class was already specified for you. If there is no entry in this field, Visual Cafe tries to use the base project name or, for a native Win32 application, the base executable name (specified in the application name field).

If your application also accepts arguments on the command line (the **main** method takes arguments), you need to specify those. See [Specifying arguments for running an application](#).

There are a few differences in the significance of a the **main** method in a bytecode and native Java application. See [The main class in bytecode and native applications](#) for more information. You can create a native Win32 application or DLL only if you have Visual Cafe Professional edition.

1. Activate the Project window of the project you want to work with.
2. Choose Project ► Options.
3. In the Project Options dialog box, click the Project tab.
4. Select Application, if needed, then type the name of the class file in the Main Class field; for example, Frame1 or Frame1.class are both acceptable. If the class is inside a package other than the Default Package, you need to type *package\_name.class\_name* in this field.

You can enter one name only.

5. Click OK.

The change takes effect the next time you run your project.

**Note** If you rename a class that appears in this field, Visual Cafe updates the field for you.



## Specifying the name of a native application or DLL

```
{button Concepts,AL('Projects_overview',0,'')} {button See  
Also,AL('Project_Options_dialog_F1;Running_a_Project_howto',0,'','visual')}
```

Visual Cafe Professional edition lets you create native Win32 applications and DLLs. You can specify the name of the compiled executable or library.

1. Activate the Project window of the project you want to work with.
2. Choose Project ► Options.
3. In the Project Options dialog box, click the Project tab.
4. While Win32 Application or Dynamic Link Library is the Project Type, type the name in the Application or Library name field.

The application name is by default the project name, appended with the **exe** extension.

The library name is by default the project name, appended with the **dll** extension.

The import library name is the name of the import library file that gets created along with your DLL. It is by default the project name, appended with the **lib** extension.

5. Click OK.

The change takes effect the next time you run your project.



## Setting the working directory for a native program

```
{button Concepts,AL('Projects_overview',0,'','')} {button See  
Also,AL('Project_Options_dialog_F1;Running_a_Project_howto',0,'','visual')}
```

Visual Cafe Professional edition lets you create native Win32 applications and DLLs. If needed, you can specify the location of a native application or the calling program used to run a native DLL. For example, you need to specify a working directory if the executable is not in the same directory where you want to run it from.

1. Activate the Project window of the project you want to work with.
2. Choose Project ► Options.
3. In the Project Options dialog box, click the Project tab.
4. While Win32 Application or Dynamic Link Library is the Project Type, type the working directory where you want to run the executable from.
5. Click OK.

The change takes effect the next time you run your project.

## Specifying a program for running and debugging a DLL

```
{button Concepts,AL('Debugging Your Program;Projects_overview',0,'')} {button See  
Also,AL('Project_Options_dialog_F1',0,'')}
```

The Visual Cafe Professional edition lets you create and debug DLLs. You need to specify a Java program from which to run and debug the DLL.

1. Activate the Project window of the project you want to work with.
2. Choose Project ► Options.
3. In the Project Options dialog box, click the Project tab.
4. While the Project Type is Win32 Dynamic Link Library, type the name of the program in the Calling program field.
5. Click OK.

The change takes effect the next time you debug the DLL.

### Note

- In the Calling program field, you can specify the name and fully qualified path to the executable. If you do not specify a fully qualified name, Visual Cafe looks in the project directory, then through the directories in your Windows PATH environment variable.
- When the program tries to load the DLL, it looks for the DLL as follows:
  1. The directory from which the application loaded. This is the project directory or, if you specified a full path, the directory where the program resides.
  2. The current working directory, if different from the directory from which the application loaded.
  3. For Windows 95, the Windows system directory. For Windows NT, the 32-bit Windows system directory, then the 16-bit Windows system directory.
  4. The Windows directory.
  5. The directories that are listed in the Windows PATH environment variable.

## Specifying arguments for running an application

```
{button Concepts,AL('Projects_overview;The_Differences_between_Applets_and_Applications',0,',','concept')} {button See  
Also,AL('Project_Options_dialog_F1;Running_a_Project_howto',0,',','visual')}
```

If your application accepts arguments on the command line (the **main** method takes arguments), you need to specify them so Visual Cafe can run your application from its environment. For example, the Sun Java compiler is written in Java and takes command line arguments.

You also need to specify the main class. See [Specifying the main class to run for an application](#).

1. Activate the Project window of the project you want to work with.
2. Choose Project ► Options.
3. In the Project Options dialog box, click the Project tab.
4. Select Application, if needed. In the Program arguments field, type any arguments that should be passed to the program when you run it.

Delimit the arguments with a space.

5. Click OK.

The change takes effect the next time you run your project.



## ► Specifying whether to parse imports

```
{button Concepts,AL('Projects_overview;The_Differences_between_Applets_and_Applications',0,',','concept')} {button See  
Also,AL('Project_Options_dialog_F1;Running_a_Project_howto',0,',','visual')}
```

Visual Cafe ships with the standard Java package imports from the Sun Microsystems Java Developers Kit (JDK) in a preparsed form. These imports might be required by applets and applications in order to execute.

By default, if you import other packages (including the Symantec packages), Visual Cafe will parse them so you can, for example, look at them in the Class Browser, view them in the Project window, and see them in the Form Designer, if applicable. Not parsing imports requires less computer resources and makes Visual Cafe run faster. You might want to disable import parsing if, for example, you import a lot of third-party packages and your computer runs very slowly as a result of the parsing.

1. Activate the Project window of the project you want to work with.
2. Choose Project ► Options.
3. In the Project Options dialog box, click the Project tab.
4. Select Parse imports to specify that imports be parsed automatically as you work with the project. Or deselect it to not parse these imports.
5. Click OK.

The change takes effect immediately if you select the option. If you deselect the option, no more imports are parsed.

## ▶ Enabling and disabling RAD and automatic code generation

```
{button  
Concepts,AL('Projects_overview;GUI_development_with_Visual_Caf;Visual_Caf_Tools_for_Working_with_Classes_and_Compo  
nents',0,','concept')} {button See  
Also,AL('Project_Options_dialog_F1;Form_Designer_F1;Adding_a_new_file_to_the_project_howto;Adding_Files_to_a_Project_  
howto;Adding_Code_to_a_Java_Source_File_howto',0,','visual')}
```

Visual Cafe Professional edition lets you turn off the visual environment for a file, and the automatic code generation that occurs by translating the visual environment into source code. You can specify in your project options that new files you add to the project — by choosing File ▶ New File, Insert

▶ Files into Project, or dragging files from a file system window into the Project window — have the Rapid Application Development (RAD) features enabled or disabled. You can also turn RAD on and off for an individual file.

By default, RAD is turned on. This means that [components](#) appear in the Objects view of the Project window, you can design your [forms](#) in the [Form Designer](#) and Menu Designer, and you can use the Interaction Wizard to specify [interactions](#). You might want to turn off RAD if, for example, you do not want Visual Cafe to automatically generate code for you, and to use less computer resources and make Visual Cafe run faster. When RAD is turned off, components disappear from the Objects view and you cannot use the Form Designer with the file. Remember, if RAD is off and you turn it on, Visual Cafe might change your code to parse it into its visual environment.

### To enable or disable RAD for new files

1. Activate the Project window of the project you want to work with.
2. Choose Project ▶ Options.
3. In the Project Options dialog box, click the Project tab.
4. Select Enable RAD For New Files to specify that new files have RAD enabled. Or deselect it to disable RAD for new files.
5. Click OK.

The change takes effect immediately for new files.

### To enable or disable RAD for an existing file in a project

1. In the Project window, click the Files tab.
2. Right-click a file, then choose Stop RAD or Start RAD.

### To enable or disable RAD for a file from the Save As dialog box

The Save As dialog box can appear when you save a file displayed in the Source window.

- Select or deselect Enable RAD.

## ► **Specifying whether to clear messages before builds**

```
{button Concepts,AL('Projects_overview;The_Differences_between_Applets_and_Applications',0,','concept')} {button See  
Also,AL('Project_Options_dialog_F1;F1_Messages_Window;Debugging Your Program;Running_a_Project_howto',0,','visual')}
```

By default, Visual Cafe clears the Messages window before each build. This makes it easier to see what messages apply to the current build. However, you can specify that the window not be cleared so you can see messages from previous builds and compare build messages.

1. Activate the Project window of the project you want to work with.
2. Choose Project ► Options.
3. In the Project Options dialog box, click the Project tab.
4. Select Clear Messages window before build to clear the Messages window before each project build. Deselect this option to not clear the window.
5. Click OK.

The change takes effect the next time you compile your project.

## Setting compiler options for a project

```
{button Concepts.AL('Projects_overview',0,'','concept')} {button See  
Also.AL('Project_Options_dialog_F1;F1_Messages_Window;Running_a_Project_howto',0,'','visual')}
```

From the Compiler tab of the Project Options dialog box, you can control what compiler information is sent to the Messages window, which Java compiler to use, if Java optimizations are performed, and more.

This view changes options for the currently selected option set, either the Debug or Final release type. For example, if you have the debug option set selected and change an option in the compiler page, Visual Cafe changes that option for the debug option set, not the final option set. For more information, see [Specifying whether builds are debug or final](#).

You can create a native Win32 application or DLL only if you have Visual Cafe Professional edition.

### To access the Compiler view

1. Activate the Project window of the project you want to work with.
2. Choose Project ► Options.
3. In the Project Options dialog box, click the Compiler tab.

### To specify general compiler options

1. From the Compiler view, choose Compiler Category ► General.
2. Select the options you want:

| Select...                  | To specify this...                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Use Java optimizations     | Optimize the Java executable for a more compact executable that runs faster. (Default: enabled for Final and disabled for Debug release types)<br><br>Select the Disable function inlining option if needed. Inlining means that Visual Cafe takes a function's code and imbeds it in the calling function instead of calling the function. Inlining increases execution speed but also increases executable size. (Default: not selected) |
| Generate debug information | Create debugging information used by the Visual Cafe debugger. For example, this option lets you see local variables during debugging. (Default: enabled for Debug and disabled for Final release types)                                                                                                                                                                                                                                   |
| Use the Sun Java compiler  | Use the Sun Java compiler, javac.exe. When this option is cleared, the Symantec Java compiler, which is faster, is used. Note that you cannot compile native Win32 applications and DLLs with the Sun Java compiler. (Default: disabled)                                                                                                                                                                                                   |
| Show compiler warnings     | Display compiler warnings in the Messages window. During development, you may want to look at items identified by warnings. (Default: enabled)                                                                                                                                                                                                                                                                                             |
| Show progress messages     | Display compiler progress messages in the Messages window. (Default: disabled)                                                                                                                                                                                                                                                                                                                                                             |
| Show dependencies          | Display file dependencies, such as imports, in the Messages window. (Default: disabled)                                                                                                                                                                                                                                                                                                                                                    |
| Show all Java messages     | When using the Sun Java compiler, this option causes the compiler to report diagnostic messages about its own execution. This option is ignored by the Symantec compiler. (Default: disabled)                                                                                                                                                                                                                                              |

3. Click OK.

The change takes effect the next time you compile your project.

### To specify exports (native Win32 only)

This option specifies the packages or classes that you want a DLL or native application to make available to a native application that uses it. The default is to export all packages and classes.

For example, you might not want to export some packages and classes for these reasons:

- You want to hide functions from use.
- You can reduce the size of a DLL by not exporting everything. The more exports you have, the larger the exports table, and the larger the image. The smaller an image, the faster it can be loaded.

Follow these steps to specify exports:

1. From the Compiler view, choose Compiler Category ► Exports.  
A list the same as the Packages view of the Project window appears.
2. Select the packages and classes you want to export.  
A grayed, selected box for a package means that not all classes are selected for that package.
3. Click OK.  
The change takes effect the next time you compile your project.

### To specify libraries to link into your source (native Win32 only)

The Libraries option lets you specify library files (**lib**) that are linked into a native application or DLL before the default library, which is included automatically by the compiler. The libraries are specified in the order you want them to be linked. The compiler links them into your source when you compile your native application or DLL. Visual Cafe can automatically locate libraries for you if they are in your library search path.

1. From the Compiler view, choose Compiler Category ► Libraries.
2. Add libraries to the list.
  - To add a library to the list, select the blank entry (marked by an empty box) at the bottom of the list and type the library name, including the full path. Or click the New button (located above the text box), then select a library by clicking the ... browse button that displays in the field. You can also use the New button to insert a new entry above the selected entry.
  - To change the link order, select a library and move it with the Up Arrow and Down Arrow buttons.
  - To delete a library from the list, select the library and click Delete.
3. Click OK.  
The change takes effect the next time you compile your project.

### To specify advanced compiler options

1. From the Compiler view, choose Compiler Category ► Advanced.
2. Specify the options you want:

| Option        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Make Settings | Specify how imports are handled when the project is compiled. (Default: Don't check dependencies on imports)<br><br>Generate classes for out-of-date imports means that Visual Cafe searches for the Java source of imports and updates the classes to the most current version, if needed. This was the default for Visual Cafe version 1.0.<br><br>Warn on out-of-date imports means you get a warning message if a class is out-of-date, but Visual Cafe does not regenerate the class.<br><br>Don't check dependencies on imports means Visual Cafe does not check imports to determine if they are out-of-date. |
| GUI           | Suppresses the console window. (Default:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

|                                                               |                                                                                                                                                           |
|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| application<br>(Professional<br>edition)                      | disabled)                                                                                                                                                 |
| Use<br>performance<br>profiling<br>(Professional<br>edition)  | Attributes the code with profiling calls so the<br>executable can generate profiling<br>information. (Default: not selected)                              |
| P6 Pentium<br>code<br>generation<br>(Professional<br>edition) | Generate P6 Pentium code. (Default:<br>generate P5 Pentium code)                                                                                          |
| Custom<br>compiler flags                                      | Pass command line options to the compiler.<br>For information on the <b>sj</b> compiler options,<br>see <a href="#">Compiling from the command line</a> . |

3. Click OK.

The change takes effect the next time you compile your project.

## Specifying file search paths and the output directory

```
{button Concepts.AL('Projects_overview',0,',','concept')} {button See  
Also.AL('Environment_Options_Dialog_F1;Project_Options_dialog_F1;Package_Tab_F1;Files_Tab_F1',0,',','visual')}
```

From the Directories tab of the Project Options dialog box, you can add and remove directories that Visual Cafe uses to locate source and class files and control where Visual Cafe puts compiler output files. This view changes the option set for the Debug or Final release type. See [Specifying whether builds are debug or final](#) for more information.

You can also set class path information for the entire Visual Cafe environment. Remember that Visual Cafe does not inherit Windows class path information unless it is set up to do so.

You can create a native Win32 application or DLL only if you have Visual Cafe Professional edition.

### To access the Directories view

1. Activate the Project window of the project you want to work with.
2. Choose Project ► Options.
3. In the Project Options dialog box, click the Directories tab.

### To specify source file search paths

The source search path applies to Java source files and any text file that can be opened in the Source window.

**Note** You can set the source search path for the entire Visual Cafe environment from the Environment Options dialog box and with the **java** statement in the Visual Cafe \Bin\sc.ini file.

1. Go to the Directories view of the Project Options dialog box.
2. Choose Source files in the Show directories field.

A list of directories that can contain source files displays. The directory order affects the search order: the topmost directory is the first to be searched. The default setting, the project directory, does not appear in the list; it is the first directory in the search order.

3. Modify the list as needed:
  - To change the order that directories are searched, select a directory and move it with the Up Arrow and Down Arrow buttons.
  - To delete a directory from the list, select the directory and click Delete.
  - To add a directory to the list, select the blank entry (marked by an empty box) at the bottom of the list and type the directory name, including the full path. Or click the New button (located above the text box), then select a directory by clicking the ... browse button that displays in the field. You can also use the New button to insert a new entry above the selected entry.
4. Click OK.

The change takes effect immediately.

### To specify the output directory for a project

You can specify where compiler output files, such as **class** files, are stored for this project.

**Note** When you run a project in the Applet Viewer, the output directory is temporarily added to the class path.

1. Go to the Directories view of the Project Options dialog box.
2. Choose Output files in the Show directories field.

The directory displays. If no directory is specified, Visual Cafe uses the default: a **class** file is placed in the same location as the corresponding **java** file. If you do specify an output directory, all output files are placed in this directory and any package file hierarchy structures are created as well.

3. Type a directory and full path in the field, or select a directory by clicking the ... browse button that displays in the field.
4. Click OK.

The change takes effect the next time you compile your project.

### To specify library file search paths (native Win32 only)

If a native application or DLL uses libraries, you need to make sure Visual Cafe can find them. To specify locations to look for libraries, follow these steps:

1. Go to the Directories view of the Project Options dialog box.
2. Choose Library files in the Show directories field.

A list of directories that can contain library files displays. The order affects the search order: the topmost directory is the first to be searched. The default is to search directories specified for the Windows LIB environment variable; these directories do not appear in the list and are last in the search order.

3. Modify the list as needed:
  - To change the order that directories are searched, select a directory and move it with the Up Arrow and Down Arrow buttons.
  - To delete a directory from the list, select the directory and click Delete.
  - To add a directory to the list, select the blank entry (marked by an empty box) at the bottom of the list and type the directory name, including the full path. Or click the New button (located above the text box), then select a directory by clicking the ... browse button that displays in the field. You can also use the New button to insert a new entry above the selected entry.
4. Click OK.

The change takes effect the next time you compile.

### To specify class search paths for a project

You can tell Visual Cafe where to look for the **class** files used by a project; for example, where to find the packages you are using. You can make up your own custom list of directories, let Visual Cafe automatically generate the class path based on the **java** files you have added to your project (including those created when you add [top-level components](#)), and use the class path set for the Visual Cafe environment. If you specify one or more of these options, the search order is your list, the automatically generated list, then the class path for the environment.

1. Go to the Directories view of the Project Options dialog box.
2. Choose Class files in the Show directories field.

A list of directories displays. The directory order affects the search order: the topmost directory is the first to be searched.

3. Modify the list as needed:
  - To change the order that directories are searched, select a directory and move it with the Up Arrow and Down Arrow buttons.
  - To delete a directory from the list, select the directory and click Delete.
  - To add a directory to the list, select the blank entry (marked by an empty box) at the bottom of the list and type the directory name, including the full path. Or click the New button (located above the text box), then select a directory by clicking the ... browse button that displays in the field. You can also use the New button to insert a new entry above the selected entry.
4. To generate the class path based on the files in the project, select Autogenerate class path. Otherwise, deselect it.

The default is selected. When this option is selected, if a file is not in the project directory, the file path is added to the class path.

5. To append the Visual Cafe environment class path to the project class path, select Append class path. If you deselect it, the class path defined for the Visual Cafe environment is not used.

The default is selected.

4. Click OK.

The change takes effect immediately.

### To set the class path for the Visual Cafe environment

Visual Cafe gets its class path information from this file: Visual Cafe Bin\sc.ini. You can modify the sc.ini file to set class path information globally for your Visual Cafe environment. You should append your information to the **classpath** statement, not delete the default **classpath** statement, because it can affect the operation of Visual Cafe. See [Setting environment variables in the sc.ini file](#) for more information.

### To have the Visual Cafe environment inherit the class path from the Windows environment

You can set up the sc.ini file so that Windows class path information is inherited by the entire Visual Cafe environment. However, realize that the class path information might not be useful for Visual Cafe projects and can cause delays whenever Visual Cafe searches for the source corresponding to a **class** file when your Java programs are built. Some products that use **class** files do not have their own **ini** file, so they put their class path information in the Windows environment.

For Windows 95, the class path is defined in the autoexec.bat file. Windows NT can also use the class path in an autoexec.bat file, if it is present.



For Windows NT 3.51, you can set the **classpath** variable by opening Control Panel then System and entering a value for the **classpath** so it appears in the System Environment Variables list box.

For Windows NT 4.0 and higher, you can set the **classpath** variable by opening Control Panel ► System

► Environment tab, and entering a value so it appears in the System or User Variables list box.

To inherit the Windows class path setting:

1. In the Environment section of Visual Cafe \Bin\sc.ini, add the following specification at the end of the **classpath** statement:  
**;%classpath%**
2. Restart Visual Cafe for the change to take effect.

#### **To set the class path for a Web browser**

Before deployment, you might want your Web browser to be able to locate the Visual Cafe classes when the browser is launched outside of the Visual Cafe environment. The Visual Cafe installer can set this class path information for you. To set it manually, make sure the following is part of the class path information for your Windows environment:

**C:\visualcafe\bin\components\symbeans.jar**

## Setting environment variables in the sc.ini file

```
{button Concepts,AL('Environment_customization_overview',0,'','concept')} {button See  
Also,AL('Environment_Options_Dialog_F1;Project_Options_dialog_F1;Package_Tab_F1;Files_Tab_F1;Specifying_the_File_Search_Path_F1',0,'','visual')}
```

If you want to set Visual Cafe environment variables (which do not affect the setting for your entire computer), you can edit the [Environment] section of Visual Cafe \Bin\sc.ini. The statement syntax is similar to that for autoexec.bat, except you omit the **set** keyword. Any changes take effect the next time you start Visual Cafe.

### Setting the class path

Class path directories are placed in a semicolon-delimited list in the sc.ini file, and this list is passed to various tools, such as the compiler, AppletViewer, and so on. The default **classpath** statement is similar to this:

```
CLASSPATH=;%@P%\..\JAVALIB;%@P%\..\JAVALIB  
  \SYMCLASS.ZIP;%@P%\..\JAVALIB\SYMANTEC.ZIP;  
  %@P%\..\JAVALIB\CLASSES.ZIP
```

To add directories, you should append them to this list, not delete the default **classpath** statement, because it can affect the operation of Visual Cafe. Remember to separate each directory with a semicolon (;). For example, to add c:\development\classes, append ;c:\development\classes so you have:

```
CLASSPATH=;%@P%\..\JAVALIB;%@P%\..\JAVALIB  
  \SYMCLASS.ZIP;%@P%\..\JAVALIB\SYMANTEC.ZIP;  
  %@P%\..\JAVALIB\CLASSES.ZIP;c:\development\classes
```

### Other examples

To set an environment variable FOO to the value BAR, you would add the following line to the [Environment] section of sc.ini:

```
FOO=BAR
```

The following example appends the system-wide value of TEMP to C:\MYTEMP and sets TEMP to this new value in the Visual Cafe environment:

```
TEMP=C:\MYTEMP;%TEMP%
```

So if the system-wide value TEMP is C:\TEMP, in Visual Cafe TEMP will be C:\MYTEMP;C:\TEMP.

Here %@P% is a macro that translates to the Bin directory of Visual Cafe:

```
RESDIR=%@P%\..resdir
```

So in a typical install this would be c:\visual\cafe\resdir. Note that you must have the final backslash (\) for the %@P% macro to work.



## Using version control

```
{button Concepts,AL('Projects_overview',0,'','concept')} {button See  
Also,AL('Environment_Options_Dialog_F1;Project_Options_dialog_F1',0,'','')}
```

You can use version control software that integrates into the Visual Cafe environment. If you have installed version control software on your computer, you will be able to select it in the Visual Cafe project options. You enable version control software on a per-project basis.

See the documentation provided with your version control system for more information.

1. Activate the Project window of the project you want to work with.
2. Choose Project ► Options.
3. In the Project Options dialog box, click the Version Control tab.
4. Choose the version control software you want to use.  
You must properly install the software before you can use it.
5. Click OK.

The change takes effect immediately.

**Note** If you enable a version control system or switch version control systems for a project, the files are checked into the new version control system as new files.

## Setting debugger options for a project

{button Concepts,AL('Projects\_overview;Working\_with\_Exceptions\_in\_Java\_and\_Visual\_Caf',0,'','concept')} {button See Also,AL('Project\_Options\_dialog\_F1;Debugging Your Program;Debugging\_Remotely;Ending\_Remote\_Applet\_Application\_Debugging',0,'','visual')}

From the Debugger tab of the Project Options dialog box, you can do the following:

- From General, you can enable remote debugging, which allows you to debug a program from a remote site. For more information, see [Starting remote applet/application debugging](#). You can also debug code in Internet Explorer or Netscape Navigator. For more information, see [Debugging code in a web browser](#).
- From Exceptions, you can view and customize how the debugger works with [exceptions](#) for this project. For more information, see [Defining how exceptions are handled by the debugger](#).

If you have Visual Cafe Professional edition, you can create and debug DLLs. During debugging, you need to specify a Java program from which to debug the DLL. See [Specifying a program for running and debugging a DLL](#) for more information.

## Debugging code in a web browser

```
{button Concepts,AL('Debugging Your  
Program;Debugging_applets_and_Applications;Understanding_the_Visual_Caf_Debugger;Understanding_Workspaces;Working  
_with_Exceptions_in_Java_and_Visual_Caf,0,','')} {button See  
Also,AL('Project_Options_dialog_F1;Projects_overview;stopping a program;pausing a program;running your program;correcting  
your source code;starting remote applet application debugging;ending remote applet application debugging;stepping into a  
method;',0,','')}
```

Visual Cafe allows you to debug your code in Netscape Navigator or Microsoft Internet Explorer instead of the Applet Viewer.

Debugging in a browser allows you to test your applet in the environment where the applet will be used. You will be able to refine your code to reflect differences in the virtual machines of the supported browsers. Visual Cafe currently supports Netscape Communicator 4.04 with the JDK 1.1 Support Patch for version 4.03 or greater, and Microsoft Internet Explorer 4.x.

### To turn on debugging in a web browser

1. Activate the Project window of the project you want to work with.
2. Choose Project ► Options.
3. In the Project Options dialog box, click the Debugger tab.
4. Choose General in the Category field.
5. Select either Netscape Navigator or Microsoft Internet Explorer/Jview.  
The default is to debug using Sun Java VM (the Visual Cafe Applet Viewer).
6. Choose Project ► Run in Debugger or Project

► Step Into to start your debugging session in the selected web browser.

#### Notes

- Netscape can only debug applets: if you change the project type to java application, then you will notice that the debug using option will be set back to Sun Java VM and the Netscape Navigator option is unavailable. Internet Explorer supports both applets and applications.
- If Visual Cafe cannot detect the supported version of either web browser then the web browser option is unavailable.
- If you save a project that has the debug in Netscape Navigator or Microsoft Internet Explorer/Jview project option selected, then for some reason you remove Netscape Navigator or Microsoft Internet Explorer and try to debug your project, you will get a message stating that the browser is not installed and that the Sun Java VM will be used instead. This dialog box has a checkbox that allows you to permanently change the option for the project to Sun Java VM to prevent the message from appearing in the future.
- The following options are not allowed while debugging in Netscape and Internet Explorer: Incremental debugging, Expression evaluation, and Remote debugging.
- The steps below must all be done to allow debugging in Netscape Navigator.
  1. Install Communicator 4.04
  2. Install the Netscape JDK 1.1 Support Patch for 4.03 or greater
  3. Change to your current Communicator "user" directory, and edit your "prefs.js" file to allow local applet access to the hard disk in ...netscape\user(your username)\prefs.js add: user\_pref("signed.applets.low\_security\_for\_local\_classes", true);

## Defining how exceptions are handled by the debugger

```
{button Concepts,AL('Debugging Your Program;Working_with_Exceptions_in_Java_and_Visual_Caf',0,'')} {button See Also,AL('Project_Options_dialog_F1;Projects_overview',0,'')}
```

You can view and customize how the debugger works with [exceptions](#) for a project. You can even add exceptions while your Java program is executing and they take effect immediately.

1. Activate the Project window of the project you want to work with.
2. Choose Project ► Options.
3. In the Project Options dialog box, click the Debugger tab.
4. Choose Exceptions in the Category field.
5. Modify the exceptions list as needed:
  - To specify that the debugger stop only if a particular exception is not handled in the code, deselect the checkbox for the exception.
  - To stop the debugger whenever a particular exception occurs, select the checkbox for an exception. The program will stop whenever the exception is encountered, regardless of whether the program handles the error or not. For example, you could use this feature to see if your code is getting an exception that is being handled by an inherited exception handler you do not know about.
  - To add a new exception to the list, click Add, then enter the exception in the blank field that appears.
  - To delete an exception from the list, select an exception to highlight it, then click Delete.
  - To restore the default exception settings, click Restore Defaults.
6. Click OK.

The change takes effect the next time the Java program is executing in the debugger; if it is already executing in the debugger, the change takes effect immediately.

## Project Templates

## Working with project templates

```
{button How  
To,AL('Creating_a_Template_howto;Defining_a_New_Default_Template_howto;Deleting_Templates_from_the_Object_Library_h  
owto;Adding_Bean_to_Library_howto',0,'','visual')} {button See Also,AL('Creating_a_Project_howto;Projects_overview',0,'','')}
```

When you create a new project, you specify a project template as the starting point. Visual Cafe provides these project templates:

| Template                                                | Description                                                                                                                                                                                                      |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Basic Applet                                            | A project that contains a single Applet.                                                                                                                                                                         |
| Basic Application                                       | A project containing a Frame (with an Open File dialog and menu bar), an About dialog (with a label and Done button), and a Quit dialog (with a Yes and a No button).                                            |
| Basic Win32 GUI Application (Professional edition)      | The same as basic application, except that the project options are set up to produce a native Win32 executable.                                                                                                  |
| Basic Win32 Console Application (Professional edition)  | A simple console application you can use as a starting point. The project options are set up for you.                                                                                                            |
| Basic Win32 Dynamic Link Library (Professional edition) | A simple DLL you can use as a starting point. The project options are set up for a DLL.                                                                                                                          |
| Bean Wizard                                             | A wizard that helps you create a basic bean. The wizard creates two files; <i>beanclassBeanInfo.java</i> and <i>beanclass.java</i> , where <i>beanclass</i> is the name of your bean. See Using the Bean Wizard. |
| Empty project                                           | A project with no components.                                                                                                                                                                                    |

You might also want to create custom templates for the different applets and applications you develop. A template is a project that contains files and components you frequently use. For example, if you commonly create a certain kind of applet that resides in an HTML file that is formatted a certain way, you could create this type of generic project and save it as a project template. Then when you create a new project, you can speed your development process by starting with your custom project template. See [Creating a project template](#) for more information.

If you do not need to create an entire custom project, but you would like to create a custom component, see [Using the Component Library](#).





## Defining a new default template

```
{button Concepts,AL(`Working_with_Templates_overview;Projects_overview',0,'','concept')}} {button See  
Also,AL(`Creating_a_Project_howto;Creating_a_Template_howto;Deleting_Templates_from_the_Object_Library_howto',0,'','visual')}}}
```

You can select a template to use as the default for all new projects.

1. Choose File ► New Project.

The current default template is highlighted and an asterisk is placed next to the template name.

2. Select a template.
3. Click Set Default.
4. Click OK.

A new project is created based on the selected template. This template will be used for subsequent new projects until the default is changed.

## ▶ Creating a project template and adding it to the library

```
{button Concepts,AL(^Working_with_Templates_overview;Projects_overview',0,',';concept')} {button See  
Also,AL(^New_Project_dialog_F1;Defining_a_New_Default_Template_howto;Deleting_Templates_from_the_Object_Library_how  
to;Adding_Bean_to_Library_howto;Object_Library_F1',0,',';')}
```

Project templates are used as the basis of new projects. When you create a project from a template, the project initially contains the files and components in the template. You can create your own templates as the starting point of new projects.

**Important** When you save a project as a template, make sure all of your source files (both **java** and **html**) are in the same project directory or a subdirectory of the project directory.

1. Create a project to be used as the template.  
Add components, such as forms, dialogs, and menus, that you want to reuse.
2. With the current project in a Project window, choose Project ▶ Create Project Template.  
The Create Template dialog box displays.
3. Select the group that you want the template to belong to in the Component Library.  
If you do not select a group, the template is added to the Project Templates group.
4. Type a name and description for the template in the appropriate fields.  
The name and description is displayed for the template in the New Project dialog box. The description displays when the template is listed in the Component Library window.
6. Click OK.  
Visual Cafe copies the project and stores it as a project template. The template is now available from the New Project dialog box.



## Deleting a project template

```
{button Concepts,AL('Working_with_Templates_overview;Projects_overview',0,'','concept')} {button See  
Also,AL('Creating_a_Template_howto;Adding_Bean_to_Library_howto',0,'','visual')}
```

The project templates that ship with Visual Cafe cannot be deleted. You can delete a project template that you create as long as it is not the current default template. After you delete it, it no longer appears in the New Project dialog box.

1. To open the Component Library, choose View (or Window) ► Component Library.
2. Display the contents of the Project Templates folder.
3. Select the template from the template list.
4. Press the DELETE key.

## Obsolete Project Topics

## Managing your projects in Visual Cafe

```
{button How  
To,AL('creating_a_project_howto;adding_objects_to_project_howto;adding_files_to_a_project_howto;deleting_objects_from_a_  
project_howto;running_a_project_howto;deleting_packages_from_a_project_howto,')} {button See  
Also,AL('Form_Designer_F1;The_Debugging_Workspace;Differences_between_Applets_and_Applications;Understanding_Wor  
kspaces;Using_Visual_Caf_as_Your_Development_Environment;The_Development_Life_Cycle_A_Two_Step_Process',0,','')}
```

The primary component you work with in Visual Cafe is a project. Visual Cafe uses projects to store all the source files that make up your programs. Typical projects include a set of [components](#) including [forms](#) (such as windows and dialog boxes) and applets. Projects provide vital organization to your programs as they grow more complex. Visual Cafe cannot create a program outside the project environment; meaning you cannot just compile and run a single source file with Visual Cafe. Every Java program you create with Visual Cafe must start out as a project. It is good practice, for organizational reasons, to create a separate directory for each new project you create.

You work with projects in the Project window which allows you to open forms in the Form Designer, open source code and manually create interactions in the [Source window](#). In the Project window, you can also add and remove files from a project. The Project window lists all forms, components, and classes in a project. Visual Cafe lets you choose how you want to view your project, either as a list of visual components or as a list of source files grouped in packages.

In Visual Cafe, you can also create projects that have no visual elements but are just made up of source code, for example, you may be building a Java component.

### Automatic code generation for your project

As you build or edit an applet, code is dynamically generated for the components in your program. Visual Cafe generates Java source code for your programs and automatically adds the source file to your project. Furthermore, Visual Cafe fully supports [two-way editing](#) of visual components. For example, if you open the source code for your applet and change the label of a button or even declare a new button, the change is visible in the form as you write the code.

Double-click a component on your form to open the source window, and the Source Window shows the [events](#) available for the component. Visual Cafe also generates event-handler code and embeds it into your project. Select an event from the drop-down list and Visual Cafe inserts a method for the event, and you are ready to add the body code for the method.

### Creating projects

You create new projects from the File menu. Just as a word-processing document contains text and perhaps graphics, projects are containers for forms, components, source file, etc. When a project is created, a Project window is opened and each item in the project is shown in the project list. If you create more than one new project, a Project window is opened for each new project.

### Default projects

When you start Visual Cafe, a new project is automatically created. When the project is generated, the Project window is updated to show an item representing each of the components in the project. Initially, the applet "Applet1" appears in the Project Window. The applet opens in a separate window where the window is active and ready to be edited.

Initially, the default project is a Basic Applet project. The default project type is shown in the New Project dialog box in boldface text with an asterisk before its name. You can change the default project type in the New Project dialog box.

Projects include a set of [components](#) including [forms](#) (such as windows and dialog boxes). A typical project is a collection of forms. Forms are containers for components, such as static text, list boxes, menu bars, graphics, scroll bars, and buttons. In addition to these standard Java class components, Visual Cafe also provides you with many other components. All Visual Cafe components are organized in the Visual Cafe Component Library.

The Project window lists all forms, components, and classes in a project.

Each object in the project is made of two elements:

- a visual attribute
- the object's class (Java code)

As you build or edit an applet, code is dynamically generated for the components in your program. Visual Cafe generates Java source code for your programs and automatically adds the source file to your project. Furthermore, Visual Cafe fully supports [two-way editing](#) of visual components. For example, if you open the source code for your applet and change the label of a button or even declare a new button, the change is visible in the form as you write the code.

Packages view shows **java** source files, not the corresponding compiled **class** files, because you are interested in source files during development.



## Visual Cafe file extensions

```
{button Concepts,AL('Projects_overview',0,',','concept')} {button See  
Also,AL('Insert_class_dialog_F1;Adding_Files_to_a_Project_howto;Opening_a_Project_howto',0,',','visual')}
```

Visual Cafe creates several files that contain information about your project and stores them in the project directory:

| Extension   | Description                                                                                           |
|-------------|-------------------------------------------------------------------------------------------------------|
| <b>.vpj</b> | The Visual Cafe project                                                                               |
| <b>.vep</b> | Visual Cafe project options and file list                                                             |
| <b>.ve2</b> | Secondary project information                                                                         |
| <b>.cdb</b> | Compiled database that Visual Cafe uses to track compilation dependencies (created after compilation) |

These files are not needed for deployment. The **vep** file name displays in the title bar of the Project window; the rest of the project files do not appear in the Project window.

**Note** In Visual Cafe 1.0, you opened a project by opening the **vpj** file. In Visual Cafe 2.0, you open a project by opening the **vep** file.

Visual Cafe can also create these files and store them in the project directory:

| Extension     | Description                               |
|---------------|-------------------------------------------|
| <b>.java</b>  | A Java source file, such as for an applet |
| <b>.class</b> | A compiled version of a Java source file  |
| <b>.html</b>  | An HTML file                              |

Double-clicking a Java or HTML file in the Project window opens that file in a Visual Cafe editor. For deployment, you need the compiled version of your Java files (the **class** files) and, for applets, any HTML files you want to use for your Web pages. In addition, you also need your graphics files.

The Java source files and compiled Java files have the same file names, but different extensions. You see only the **java** files in the Project window, because they are used for development, while **class** files are used for deployment.

**Note** File names are relative to the current project. For example, if you add a file called `foo.java` and it resides in a subdirectory (called `foo1`) of the project directory, the file name is stored as `foo1\foo.java` and is not fully qualified. If `foo1` was a directory at the same level as the project directory, the file would be stored as `..\foo1\foo.java`.



## Using the Project window

```
{button Concepts,AL('Projects_overview',0,'','concept')} {button See  
Also,AL('Creating_a_Project_howto;Drag_and_Drop_Behavior_Project_overview;Adding_a_Dialog_howto',0,'','visual')}
```

**File ▶ Open**  
**File**

### ▶ New Project

The Project window displays a list of objects in the current project (Objects tab) and the Java packages that are associated with the project (Packages tab).

You can expand and collapse project **forms** to view the object's child components by using the standard Windows keyboard sequences and visual expansion element (+).

Clicking a Project window makes that project current.

To access other tools from the Project window:

| <u>Double-click</u> | <u>Opens</u>  |
|---------------------|---------------|
| component           | Form Designer |
| Java or HTML file   | Source window |
| menu component      | Menu Designer |

### Tasks

[Adding objects to a project](#)

[Connecting two components](#)

[Creating a form](#)

[Deleting objects from a project](#)

[Editing a form](#)

[Viewing a project by objects](#)

[Viewing a project by packages](#)





## Moving a file to another project

{button Concepts,AL('Projects\_overview',0,'','concept')} {button See  
Also,AL('Adding\_a\_new\_file\_to\_the\_project\_howto;Adding\_Files\_to\_a\_Project\_howto',0,'','visual')}

If you are not going to generate code with Visual Cafe again, you can reuse a file from an existing project by adding that file to a new project. See [Adding an existing file to a project](#).

However, if you will be making changes that change code, you should instead copy the file. See [Copying a file in a project](#).

**Note** File names are relative to the current project. For example, if you add a file called foo.java and it resides in a subdirectory (called foo1) of the project directory, the file name is stored as foo1\foo.java and is not fully qualified. If foo1 was a directory at the same level as the project directory, the file would be stored as ../foo1\foo.java.



## Creating a new document

```
{button Concepts,AL('Projects_overview',0,'')} {button See  
Also,AL('Adding_a_new_file_to_the_project_howto;Adding_Files_to_a_Project_howto',0,'')}
```

You can create documents from within Visual Cafe. You may want to create documents for custom HTML pages and Java files.

1. Choose File ► New File.

A new, untitled, blank file opens in the Source window.

2. In the Source window, edit the document.
3. Save the document with File ► Save As or Save.

When you save the file, be sure to select the correct document type: HTML, Java, definition.



## Debugging in Netscape

```
{button Concepts,AL('Debugging Your Program',0,'')} {button See  
Also,AL('Project_Options_dialog_F1;Projects_overview',0,'')}
```

You can debug your program in Netscape instead of the Applet Viewer. <<Probably additional considerations to add here.>>

1. Activate the Project window of the project you want to work with.
2. Choose Project ► Options.
3. In the Project Options dialog box, click the Debugger tab.
4. Choose General in the Category field.
5. Select Debug in Netscape if you want to debug in Netscape instead of the Applet Viewer.
6. Click OK.

The change takes effect the next time the Java program is executing in the debugger.

## In the Project window, Objects view

| <u>Dragging</u>                 | <u>From</u>                                  | <u>Into</u>                | <u>Effect</u>                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------|----------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A component or <b>java</b> file | Component Library or Palette                 | Project window             | Copies the component to the new project. Containers are placed at the top level or in another container, depending on where you drag the component or on the characteristics of the component. Containers at the top level mean a new <b>java</b> file is added to your project; components added to a container mean that code is generated in the <b>java</b> file for the top-level container. |
|                                 | Project window                               | A different Project window | Copies the file or component to the new project.                                                                                                                                                                                                                                                                                                                                                  |
|                                 | Windows Explorer or other file system window | Project window             | Adds the file to the project. (However, it does not copy the file to the project directory. See <a href="#">Sharing files between projects.</a> )                                                                                                                                                                                                                                                 |

**Designing forms, including Form Designer, Property List, and layout managers**

## GUI development with Visual Cafe

```
{button How
To,AL(' Forms_adding_objects;Connecting_Form_components_howto;Creating_a_Form_howto;Designing_and_Building_GUIs_
with_Visual_Caf;Property_Inspector_using_F1;arranging_components_on_a_form_howto;adding_a_menu_to_a_form_howto',0,
',';')} {button See
Also,AL(' Animation_and_Multithreading;Form_Designer_F1;Projects_overview;Creating_Interactions;Layout_Managers;Arrangi
ng_Objects_with_Layout_Managers;Maintaining_and_Porting_Your_Java_Applets_and_Applications;Object_Library_F1;Differen
ces_between_Applets_and_Applications;Understanding_Visual_Components;Using_the_Menu_Editor_F1;Understanding_Conta
iners;How_is_my_Work_Kept_In_Sync_overview',0,',';')}
```

Visual Cafe makes it much easier to design your graphical user interface (GUI) by allowing you to visually lay out your applets and windows. To design your GUI, you must first create a Visual Cafe [project](#). Then you can:

- Add [components](#), such as windows, dialogs, text, buttons, and graphics, to the project. Some components contain other components, and some components must be contained by another component. For example, a button must be contained by another component, such as an applet, window, or dialog. Components can be added to a project from the Component Library or Palette.
- Open top-level components, or [forms](#), in the Form Designer, then visually arrange components on the form. You can drop components into the Project window or directly into the Form Designer, and then arrange them on the Form Designer.
- Set component [properties](#), such as color and text, in the Property List. These changes are immediately reflected in the Form Designer.
- Use customizers to edit components when you want a wizard-like interface for changing properties. These changes are immediately reflected in the Form Designer.
- Create [interactions](#) between components. For example, if a user clicks a Clear button, a text field clears.

### What are Visual Cafe forms?

Some components can only appear at the top level in the Objects view of the Project window. These are the Visual Cafe forms, including the Applet, Frame, Window, and some dialog components. If you look in the Component Library, the forms provided with Visual Cafe are all in one Forms group. A form can contain other components, such as text, buttons, and graphics.

### Working in the Form Designer

The Form Designer is a separate Visual Cafe window that displays a form. The window size is the size of your form. Components contained by the form appear on the form. For example, if you run an applet in a Web browser, the applet will appear the same size as it does in the Form Designer window. The components contained by the form appear as shown in the Form Designer. While working with Visual Cafe, you can have multiple Form Designer windows open at once — one per form.

The Form Designer uses an integrated [Java Virtual Machine](#) to run Java code at design time. This allows the Form Designer to provide a true what-you-see-is-what-you-get (WYSIWYG) design environment, including the accurate representation of complex [layouts](#) using the various Java layout managers. It also allows the Form Designer to run Java components and applets at design time so that the effects of run-time factors, such as an on-screen animation, can be accounted for in the layout design.

### Creating Java code

A top-level component corresponds to a Java source file. Visual Cafe automatically creates the Java code and updates the code as you visually design your GUI.

### Using top-level components in Java programs

The top-level component for an [applet](#) is the Applet component. The **init** method, which is called by another program (such as a Web browser), is the entry point of the applet. If you use the Basic Applet [project template](#) provided with Visual Cafe, the applet is already set up for you programmatically.

The top-level component for an [application](#) with a GUI is the Frame component. The **main** method, usually called from the command line, is the entry point of the application. If you use the Basic Application template provided with Visual Cafe, the main window is already set up for you programmatically.

Other top-level components are the Window component and some dialog components. When you create a Java program, you can display these top-level components from an Applet or Frame, for example.

### Using virtual fonts

Visual Cafe supports the Java virtual font classes, which you can use to ensure cross-platform compatibility. To use virtual fonts, specify Serif, Sans-serif, Monospaced, Dialog, or DialogInput in your programs, rather than a particular typeface such as Times or Helvetica. Note that virtual font classes are no longer mapped to non-Latin1 classes of fonts.





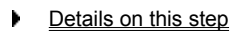
## Designing a GUI with Visual Cafe

```
{button
Concepts,AL('Understanding_Containers;GUI_development_with_Visual_Caf;Arranging_Objects_with_Layout_Managers;Using
_the_Menu_Editor_F1;Projects_overview;How_is_my_Work_Kept_In_Sync_overview',0,'')} {button See
Also,AL('Property_Inspector_using_F1;Deleting_Objects_from_a_Project_howto;arranging_components_on_a_form_howto;addi
ng_a_menu_to_a_form_howto;Animation_and_Multithreading;Form_Designer_F1;Creating_Interactions;Layout_Managers;Main
taining_and_Porting_Your_Java_Applets_and_Applications;Object_Library_F1;Differences_between_Applets_and_Applications;
Understanding_Visual_Components',0,'')}
```

In general, to design your graphical user interface (GUI), you follow these basic steps:

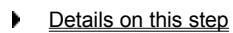
1. Add [forms](#) to the project.

When you created the project, your project template might have already added forms to your project.



[Details on this step](#)

2. Add [components](#) to your forms and arrange them.

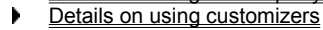


[Details on this step](#)

3. Modify component [properties](#).



[Details on using the Property List](#)



[Details on using customizers](#)

4. Create component [interactions](#).



[Details on this step](#)



## Understanding containers

```
{button How  
To,AL('Drag_and_Drop_Behavior_FormD_overview;forms_adding_objects;Creating_a_Form_howto;Property_Inspector_using_  
F1;Arranging_Components_on_a_Form_howto',0,'')} {button See_Also,AL('Form_Designer_F1;Layout  
Managers;Overview_of_Visual_Caf;Object_Library_F1;Differences_between_Applets_and_Applications;Understanding_Visual_  
Components;Working_Visually_with_Visual_Caf;Working_with_Windows_Menus_and_Dialogue_Boxes;Arranging_Objects_with_  
_Layout_Managers',0,'')}
```

Some [components](#) can contain other components, such as text, buttons, graphics, charts, and so on. These components are called [containers](#).

In general, while components are independent objects, there is a certain parent and child relationship that exists between containers and other components.

Java defines containers as components that hold any number of components, including other containers. Containers hold and organize your components, but they also contain code for [event](#) handling and many essential things such as controlling the cursor image and the program's icon. All containers allow for operations such as adding, removing, and painting their contents, or components. Containers allow for the grouping of related components together and treating them as a single unit, simplifying the amount of programming you have to do.

To better understand the idea of containers, think of all visual components as children of the [form](#) on which they are displayed. Most components [inherit](#) the read-only Parent property, which displays the form. The placement of visual components is also relative to the Parent form. Visual components cannot be moved outside the boundaries of the parent. Moving a form moves the components as well.

The top-level containers, or forms, are Applet, Frame, Window, and some dialogs. When displayed in the Form Designer, the size of the window is the bounds of the form.

Other containers are panels, MenuBar, Menu, and some dialogs. These containers can be contained by a form, but are not forms themselves.

## How Visual Cafe keeps work synchronized

```
{button How  
To,AL('Adding_Files_to_a_Project_howto;Adding_objects_to_project_howto;Creating_a_Project_howto;Forms_adding_objects;  
Form_Designer_F1;binding_code_to_a_form_component_howto;Arranging_Components_on_a_Form_howto;Designing_and_B  
uilding_GUIs_with_Visual_Caf',0,'')} {button See  
Also,AL('Property_Inspector_using_F1;Source_Window_F1;Class_Browser_using_F1;Overview_of_Visual_Caf;Understanding_  
Containers;GUI_development_with_Visual_Caf;Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,'')}
```

As you work in the Project window and Form Designer, Visual Cafe automatically adds the source code files to your [project](#) for your [forms](#) and generates the Java source code for [components](#). As you modify a component, the underlying Java code changes.

When editing the source code for a component directly, any change that you make is interpreted and the source change is reflected in the Form Designer.

The power behind Visual Cafe component coding is its source parsing technology. The Visual Cafe parser reads your Java source code in a background thread as the code is added to your project. This reading results in a symbolic object map of your source code. This map is used by the Class Browser and Hierarchy Editor to allow you to navigate and edit your Java classes.

The Visual Cafe source parser is independent of the compiler and frees you from having to compile your code before obtaining class information. The parser automatically detects changes to your Java source code and refreshes the object information as you save the source changes.

When you edit source files outside of the Visual Cafe environment, the changes are reflected the next time that you open the project in Visual Cafe. See [Adding Code to a Java Source File](#) for important guidelines.

## Form Designer

## ▶ Editing forms in the Form Designer

```
{button
Concepts,AL(^The_Development_Life_Cycle_a_Two_Step_Process;GUI_development_with_Visual_Caf;Understanding_Contain
ers;How_is_my_Work_Kept_In_Sync_overview;Arranging_Objects_with_Layout_Managers',0,','')} {button See
Also,AL(^Creating_a_Form_howto;Object_Library_F1;Designing_and_Building_GUIs_with_Visual_Caf;Using_the_Menu_Editor_
F1;Property_Inspector_using_F1;Arranging_Components_on_a_Form_howto',0,','')}
```

The Form Designer is the main tool for designing the interface to your [applet](#) or [application](#). You use the WYSIWYG Form Designer to design windows, applets, dialog boxes, and message boxes.

The Form Designer is fully integrated into the Visual Cafe development environment. As you design your [forms](#), its Java source, properties, and project are dynamically kept in sync. Visual Cafe provides this powerful functionality by using a Java virtual machine to read and maintain source code while you design.

You can perform these tasks that relate to the Form Designer:

[Adding a form to a project](#)

[Adding components to a form and arranging them](#)

[Dragging-and-dropping into the Form Designer](#)

[Renaming a component in a project](#)

[Deleting a component from a project](#)

[Overlapping components in applets](#)

[Tabbing between fields](#)

[Displaying invisible components](#)

[Viewing and changing component properties](#)

[Adding an interaction between components](#)

### To access the Form Designer

- Double-click the form in the Objects view of the Project window. Or right-click the form, and choose *Edit form*.

## Adding a form to a project

```
{button
Concepts,AL('Projects_overview;GUI_development_with_Visual_Caf;Understanding_Containers;How_is_my_Work_Kept_In_Sy
nc_overview;Component_Properties_overview;Arranging_Objects_with_Layout_Managers',0,','')} {button See
Also,AL('Form_Designer_F1;Forms_adding_objects;Drag_and_Drop_Behavior_FormD_overview;Renaming_an_Object_howto;
Deleting_Objects_from_a_Project_howto;Tabbing_Between_Fields_overview;Displaying_Invisible_Components_howto;Property
_Inspector_using_F1;Connecting_Form_components_howto;Deleting_Files_from_a_Project_howto;Designing_and_Building_G
Uis_with_Visual_Caf;Using_the_Menu_Editor_F1;Overlapping_components_overview',0,','')}
```

Some [components](#) can only appear at the top level in the Objects view of the Project window. These are the Visual Cafe forms, including the Applet, Frame, Window, and some dialog components. If you look in the Component Library, the forms provided with Visual Cafe are all in one Forms group. A form can contain other components, such as text, buttons, and graphics.

The form for an [applet](#) is the Applet component. The form for an [application](#) with a GUI is the Frame component.

Other forms are the Window component and some dialog components. When you create a Java program, you can display these forms from an Applet or Frame, for example.

### To add a form by using the Insert menu

1. While the project is selected, choose Insert ► Form.
  2. Select a form template.
  3. Click OK.
- The new form is added to the project and the Form Designer opens.

### To add a form by using drag-and-drop

You can drag a form from the following areas into the Project window:

- the Component Palette
- the Component Library
- the same Project window (press CONTROL and drag to copy the form)
- a different Project window

**Note** If the parse fails, you can see a file in the Packages and Files view, but not see an object in the Objects view of the Project window. You probably need to correct the Java code to get the file to parse. See [Adding code to a Java source file](#) for more information.

## Adding components to a form and arranging them

```
{button  
Concepts,AL('Projects_overview;GUI_development_with_Visual_Caf;Understanding_Containers;How_is_my_Work_Kept_In_Sy  
nc_overview;Component_Properties_overview;Arranging_Objects_with_Layout_Managers',0,','')} {button See  
Also,AL('Form_Designer_F1;Creating_a_Form_howto;Drag_and_Drop_Behavior_FormD_overview;Renaming_an_Object_howt  
o;Deleting_Objects_from_a_Project_howto;Tabbing_Between_Fields_overview;Displaying_Invisible_Components_howto;Proper  
ty_Inspector_using_F1;Connecting_Form_components_howto;Deleting_Files_from_a_Project_howto;Designing_and_Building_  
GUIs_with_Visual_Caf;Using_the_Menu_Editor_F1;Overlapping_components_overview',0,',')}
```

After you add a [form](#) to a project, you can add [components](#) to it and arrange the components in the Form Designer.

To display the Form Designer, double-click the form in the Objects view of the Project window. Or right-click the form, and choose *Edit form*.

Then you can perform these tasks:

- Use the default layout tools or choose a layout manager for the form.

▶ [Details on this task](#)

- Add components to the form.

▶ [Details on this task](#)

You can copy components to add them.

▶ [Details on copying components](#)

- Size components, and position the components on the form by dragging them.

When a component is selected and you move the cursor over a square (handle) on the edge of the component, the cursor changes to a two-way arrow, which means you can click and drag to resize the component.

When a component is selected and you move the cursor over it, the cursor changes to a four-way arrow, which means you can click and drag the component to another location.

To select multiple components, Shift-click them or drag over them.

### Note

- The placement and size of a component might be restricted if you are using a layout manager.
- There are several considerations to keep in mind if you want to overlap components. See [Overlapping components in applets](#) for more information.
- For deployment purposes, it is best to use a relative URL. That way you can move your Java program to another location and files can still be found. A relative URL specifies the file relative to the Java program. For example, if Applet1 is in a Project directory and graphics files are in an Images subdirectory, specify just *Images/file*.

## Dragging-and-dropping into the Form Designer

```
{button
Concepts,AL('Projects_overview;GUI_development_with_Visual_Caf;Understanding_Containers;How_is_my_Work_Kept_In_Sy
nc_overview;Component_Properties_overview;Arranging_Objects_with_Layout_Managers',0,'','concept')}} {button See
Also,AL('Form_Designer_F1;Creating_a_Form_howto;Forms_adding_objects;Drag_and_Drop_Behavior_FormD_overview;Ren
aming_an_Object_howto;Deleting_Objects_from_a_Project_howto;Tabbing_Between_Fields_overview;Displaying_Invisible_Co
mponents_howto;Property_Inspector_using_F1;Connecting_Form_components_howto
Deleting_Files_from_a_Project_howto;Designing_and_Building_GUIs_with_Visual_Caf;Using_the_Menu_Editor_F1;Overlapping
_components_overview',0,'','')}}
```

You can use standard graphical user interface (GUI) techniques for dragging and dropping [components](#) into a [form](#) displayed in the Form Designer.

When dragging components, a + appears over the cursor when a copy operation is being performed.

Visual Cafe does not allow inappropriate copies and moves, such as dropping a component into a container when that component must be at the top level. While dragging, a circle with a line through it means the operation is not allowed.

| Drag from...                 | Into...                            | Result...                                                                             |
|------------------------------|------------------------------------|---------------------------------------------------------------------------------------|
| Component Library or Palette | Form Designer                      | Copies the component to the new project (in other words, instantiates the component). |
| Project window               | Form Designer in same project      | Moves the location of the item. Or press CONTROL and drag an item to copy it.         |
| Project window               | Form Designer in different project | Copies the file or component to the new project.                                      |
| Form Designer                | Form Designer in same project      | Moves the location of the component; or press CONTROL and drag to copy a component.   |
| Form Designer                | Form Designer in different project | Copies the component.                                                                 |

## Using a customizer to configure a component on a form

```
{button
Concepts,AL('Projects_overview;GUI_development_with_Visual_Caf;Understanding_Containers;How_is_my_Work_Kept_In_Sy
nc_overview;Component_Properties_overview;Arranging_Objects_with_Layout_Managers',0,'','')} {button See
Also,AL('Form_Designer_F1;Creating_a_Form_howto;Forms_adding_objects;Drag_and_Drop_Behavior_FormD_overview;Ren
aming_an_Object_howto;Deleting_Objects_from_a_Project_howto;Tabbing_Between_Fields_overview;Displaying_Invisible_Co
mponents_howto;Property_Inspector_using_F1;Connecting_Form_components_howto;Deleting_Files_from_a_Project_howto;D
esigning_and_Building_GUIs_with_Visual_Caf;Using_the_Menu_Editor_F1',0,'','')}}
```

Visual Cafe allows you to call a customizer to configure the characteristics or behavior of a bean. Use a customizer when you want more guidance to configuring a bean's behavior than the Property list provides.

If Visual Cafe detects a `bd.SetValue("hidden-state", Boolean.True)` statement in the BeanInfo of a bean, you will not be able to access the customizer. Properties exposed in the Property List can still be edited. If a bean has a hidden state set to true, it may be designed to work with serialization.

If Visual Cafe cannot detect whether a bean has a hidden state set to true, any changes made in the customizer that do not correlate to an item on the Property List will be lost.

**Note** Customizers will vary from bean to bean since each bean has a unique customizer created by the bean developer. Not all beans may have a customizer.

### To access a customizer

1. Right click any component in the Form Designer.
2. Choose Customizer from the pop-up menu.  
The customizer menu item is not available unless the component has a customizer.

3. Make any necessary changes in the customizer.



## Overlapping components in applets

```
{button  
Concepts,AL('Projects_overview;GUI_development_with_Visual_Caf;Understanding_Containers;How_is_my_Work_Kept_In_Sy  
nc_overview;Component_Properties_overview;Arranging_Objects_with_Layout_Managers',0,'')} {button See  
Also,AL('Form_Designer_F1;Creating_a_Form_howto;Forms_adding_objects;Drag_and_Drop_Behavior_FormD_overview;Ren  
aming_an_Object_howto;Deleting_Objects_from_a_Project_howto;Tabbing_Between_Fields_overview;Displaying_Invisible_Co  
mponents_howto;Property_Inspector_using_F1;Connecting_Form_components_howto;Deleting_Files_from_a_Project_howto;D  
esigning_and_Building_GUIs_with_Visual_Caf;Using_the_Menu_Editor_F1',0,'')}
```

Different Web browsers use a different “z-order” when determining how components overlap in an applet. The project window displays the order, and the browser can read it from top to bottom or from bottom to top. For example, if an InvisibleHTMLLink is on top of an image, you need to make sure it ends up on top for users to be able to click it. To ensure compatibility with different browsers, it is a good idea to “sandwich” the InvisibleHTMLLinks on top and beneath lightweight components they overlap. Use Layout ▶ Send to Back or Send to Front.

You need to pay attention to whether heavyweight and lightweight components overlap, because heavyweight components always overlap lightweight components. See [Using lightweight components](#) for more information.

## ▶ **Tabbing between fields**

```
{button  
Concepts,AL('Projects_overview;GUI_development_with_Visual_Caf;Understanding_Containers;How_is_my_Work_Kept_In_Sy  
nc_overview;Component_Properties_overview;Arranging_Objects_with_Layout_Managers',0,',';')} {button See  
Also,AL('KeyPressManagerPanel;Form_Designer_F1;Creating_a_Form_howto;Forms_adding_objects;Drag_and_Drop_Behavi  
or_FormD_overview;Renaming_an_Object_howto;Deleting_Objects_from_a_Project_howto;Displaying_Invisible_Components_  
howto;Property_Inspector_using_F1;Connecting_Form_components_howto;Overlapping_components_overview;Deleting_Files_  
from_a_Project_howto;Designing_and_Building_GUIs_with_Visual_Caf;Using_the_Menu_Editor_F1',0,',';')}
```

You can allow users to tab between fields on a [form](#) by placing the fields in a `KeyPressManagerPanel` container. The tab order of the [components](#) contained by the panel is listed in the Project window. To change the tab order, change the order of components in the Project window list.

To tab out of the panel to the next traversable component in the Java application, press CTRL+TAB.



## Displaying invisible components

```
{button  
Concepts,AL('Projects_overview;GUI_development_with_Visual_Caf;Understanding_Containers;How_is_my_Work_Kept_In_Sy  
nc_overview;Component_Properties_overview;Arranging_Objects_with_Layout_Managers',0,';')} {button See  
Also,AL('Form_Designer_F1;Creating_a_Form_howto;Forms_adding_objects;Drag_and_Drop_Behavior_FormD_overview;Ren  
aming_an_Object_howto;Deleting_Objects_from_a_Project_howto;Tabbing_Between_Fields_overview;Property_Inspector_usin  
g_F1;Connecting_Form_components_howto;Overlapping_components_overview;Deleting_Files_from_a_Project_howto;Designi  
ng_and_Building_GUIs_with_Visual_Caf;Using_the_Menu_Editor_F1',0,';')}
```

An *invisible component* is not visible at run time, such as a Timer, or displays in a different way in the Form Designer and at run time, such as a MenuBar. It does not extend from the Java Component class. In the Form Designer, an invisible component is represented by an icon that does not effect the [form](#) layout.

Turning off the display of invisible components can make form development easier.

### To toggle the display of invisible components

- While the Form Designer is the active window, choose Layout ► Invisibles.

**Note** When you add an invisible component to a form, all invisible components display automatically.

## Menu Designer



## Menu creation with the Menu Designer

```
{button How  
To,AL('Popup_menu_MenuEditor_F1;Editing_Menus_howto;Adding_a_Menu_to_a_Form_howto;Adding_a_Menu_to_a_MenuB  
ar_howto;Adding_a_MenuItem_to_a_Menu_howto;Adding_a_Submenu_howto;Adding_menu_command_keys_howto;Editing_m  
enu_structure_howto;Binding_Code_to_a_Menu_Command_howto;Property_Inspector_using_F1;Object_Library_F1',0,'')}  
{button See Also,AL('Form_Designer_F1;Component_Properties_overview',0,'')}
```

You can add menu bars to frames and dialogs (they inherit from MenuContainer); applets do not support menu bars. To create a menu bar, you can do the following:

- Add a MenuBar component to a frame or dialog.
- Add one or more Menu components to the MenuBar container.
- Add one or more MenuItem components to a Menu container. You can also add CheckboxMenuItem components.
- Add one or more submenus to a menu item.
- Add command key equivalents to menu items.
- Add [interactions](#) between menu items and other components in your project. For example, specifying that a menu item open a dialog within the same project.
- Bind [custom code](#) to menu items.

The Frame component in the Basic Application template already has a menu bar, which you can modify and enhance.

The Menu Designer makes it easier to create a menu bar by letting you edit a visual representation of the menu bar. You can move items in the Menu Designer to visually change the menu structure.

### To open the Menu Designer

- Double-click a MenuBar component in the Project window or Form Designer.
- In the Project window, select the MenuBar component, then choose Object ► Edit MenuBar or right-click and choose Edit MenuBar.

## Using the Menu Designer pop-up menu

```
{button Concepts,AL('Using_the_Menu_Editor_F1',0,'','')} {button See  
Also,AL('Menus_F1;Editing_Menus_howto;Adding_a_Menu_to_a_Form_howto;Adding_a_Menu_to_a_MenuBar_howto;Adding_  
a_MenuItem_to_a_Menu_howto;Adding_a_Submenu_howto;Adding_menu_command_keys_howto;Editing_menu_structure_ho  
wto;Binding_Code_to_a_Menu_Command_howto;Property_Inspector_using_F1;Object_Library_F1',0,'','')}
```

When you right mouse click in the Menu Designer, Visual Cafe displays a pop-up menu with these commands:

### **Cut/Copy/Paste**

These edit commands perform standard Windows functions.

### **Insert Menu**

Inserts a menu in the menu bar; you can then add menu items to the menu. Also lets you create a submenu for the selected menu item.

### **Insert Menu Item**

Inserts a menu item into the selected menu that is in a menu bar.

### **Insert Checkbox Menu Item**

Inserts a checkbox menu item into the selected menu that is in a menu bar.

### **Edit Source**

Opens the source file for the menu bar so you can bind code to menu items.

### **Add Interaction...**

Opens the Interaction Wizard so you can define an interactive behavior between the selected menu item and another component in the same project.

### **Properties**

Displays the list of properties for the selected menu component.

## ▶ **Creating menu bars and menus**

```
{button Concepts,AL('Using_the_Menu_Editor_F1;Component_Properties_overview',0,','')} {button See  
Also,AL('Popup_menu_MenuEditor_F1;Adding_a_Menu_to_a_Form_howto;Adding_a_Menu_to_a_MenuBar_howto;Adding_a  
MenuItem_to_a_Menu_howto;Adding_a_Submenu_howto;Adding_menu_command_keys_howto;Editing_menu_structure_howt  
o;Binding_Code_to_a_Menu_Command_howto;Property_Inspector_using_F1;Object_Library_F1',0,','')}
```

You can add menu bars to frames (they inherit from `MenuContainer`); applets and dialogs do not support menu bars. The Menu Designer makes it easier to create a menu bar by letting you edit a visual representation of the menu bar.

In general, to design your menu bar and menus, you follow these basic steps:

1. Add a menu bar to a frame or dialog.

If you used the Basic Application project template, you already have a menu bar in the frame it created for you.

### ▶ Details on this step

2. Add menus to your menu bar.

### ▶ Details on this step

3. Add menu items to your menus.

### ▶ Details on this step

You can also add menu items that can have submenus.

### ▶ Details on this step

4. Edit the menu structure as needed.

### ▶ Details on this step

5. Associate command keys with menu items, as needed.

### ▶ Details on this step

6. Add [interactions](#) between menu items and other components in your project, as needed. For example, specifying that a menu item open a dialog within the same project.

### ▶ Details on this step

7. Bind [custom code](#) to menu items, as needed.

### ▶ Details on this step

**Tip** You can save time by copying menu bars and menus from other projects. See [Copying a component in a project](#) for more information. You can also add commonly used menu bars and menus to the Component Library and Palette. See [Using the Component Library](#).



## Adding a menu bar to a frame or dialog

```
{button Concepts,AL('Using_the_Menu_Editor_F1;Component_Properties_overview',0,'')} {button See  
Also,AL('Popup_menu_MenuEditor_F1;Editing_Menus_howto;Adding_a_Menu_to_a_MenuBar_howto;Adding_a_MenuItem_to_  
a_Menu_howto;Adding_a_Submenu_howto;Adding_menu_command_keys_howto;Editing_menu_structure_howto;Binding_Cod  
e_to_a_Menu_Command_howto;Property_Inspector_using_F1;Object_Library_F1',0,'')}
```

You can add the MenuBar component to a frame or dialog in the following ways:

- Drag a MenuBar component from the Component Library or Palette into the Project window or Form Designer.
- Use an Insert menu item:
  - While the Project window or Form Designer is active, choose Insert ► Component.
  - Right-click the frame or dialog in the Project window and choose Insert Component.
- Copy and paste it within the same project or between projects.

### ► [Details on this step](#)

To open the Menu Designer:

- Double-click a MenuBar component in the Project window or Form Designer.
- In the Project window, select the MenuBar component, then choose Object ► Edit MenuBar, or right-click and choose Edit MenuBar.



## ▶ Adding menus to a menu bar

```
{button Concepts,AL('Using_the_Menu_Editor_F1;Component_Properties_overview',0,'')} {button See  
Also,AL('Popup_menu_MenuEditor_F1;Editing_Menus_howto;Adding_a_Menu_to_a_Form_howto;Adding_a_MenuItem_to_a  
Menu_howto;Adding_a_Submenu_howto;Adding_menu_command_keys_howto;Editing_menu_structure_howto;Binding_Code_t  
o_a_Menu_Command_howto;Property_Inspector_using_F1;Object_Library_F1',0,'')}
```

You can add a Menu component to a MenuBar component.

1. Add a Menu component to a MenuBar component in one of the following ways:
  - Drag a Menu component from the Component Library or Palette into its position in the Project window or Menu Designer.
  - Use an Insert menu item:
    - While the menu bar is selected in the Menu Designer, right-click and choose Insert Menu.
    - Right-click the menu bar in the Project window and choose Insert Component.
    - While the menu bar is selected in the Project window or Menu Designer, choose Insert ▶ Component.
  - Copy and paste it within the same project or between projects.

### ▶ Details on this step

2. In the Property List, set the menu properties, including the menu name in the Label property.

The Help Menu property lets you integrate the menu item into an existing Help menu that is part of the operating system, for example.



## Adding menu items to menus

```
{button Concepts,AL('Using_the_Menu_Editor_F1;Component_Properties_overview',0,',')} {button See  
Also,AL('Popup_menu_MenuEditor_F1;Editing_Menus_howto;Adding_a_Menu_to_a_Form_howto;Adding_a_Menu_to_a_Menu  
Bar_howto;Adding_a_Submenu_howto;Adding_menu_command_keys_howto;Editing_menu_structure_howto;Binding_Code_to  
_a_Menu_Command_howto;Property_Inspector_using_F1;Object_Library_F1',0,',')}
```

You can add a MenuItem or CheckboxMenuItem component to a Menu component. To create a menu item that can have submenus, see [Adding submenus](#).

1. Add a MenuItem or CheckboxMenuItem component to a Menu component in one of the following ways:
  - Drag a component from the Component Library or Palette into its position in the Project window or Menu Designer.
  - Use an Insert menu item:
    - While a menu item is selected in the Menu Designer, right-click and choose Insert ► Menu Item or Checkbox Menu Item.
    - Right-click the menu in the Project window and choose Insert Component.
    - While a menu is selected in the Project window or Menu Designer, choose Insert ► Component.
  - Copy and paste it within the same project or between projects.

### ► [Details on this step](#)

2. In the Property List, set the menu item properties, including the menu item name in the Label property.

**Tip** To add more menu items, you can now select the empty bottom menu item in the list and enter its properties.



## Adding submenus

```
{button Concepts,AL('Using_the_Menu_Editor_F1;Component_Properties_overview',0,','')} {button See  
Also,AL('Popup_menu_MenuEditor_F1;Editing_Menus_howto;Adding_a_Menu_to_a_Form_howto;Adding_a_Menu_to_a_Menu  
Bar_howto;Adding_a_MenuItem_to_a_Menu_howto;Adding_menu_command_keys_howto;Editing_menu_structure_howto;Bindi  
ng_Code_to_a_Menu_Command_howto;Property_Inspector_using_F1;Object_Library_F1',0,','')}
```

You can add a MenuItem or CheckboxMenuItem component to a Menu component that is within another Menu component.

1. In the Menu Designer, right-click a menu item and choose Insert Menu.  
A menu that can have submenus appears.
2. While the new menu is selected, in the Property List set the menu properties, including the name of the menu in the Label field.
3. Click the submenu box, then add a menu item.



### Details on this step

**Tip** To add more submenu items, you can now select the empty bottom submenu item in the list and enter its properties.



## Associating command keys and menu items

```
{button Concepts,AL(^Using_the_Menu_Editor_F1;Component_Properties_overview',0,',')} {button See  
Also,AL(^Popup_menu_MenuEditor_F1;Editing_Menus_howto;Adding_a_Menu_to_a_Form_howto;Adding_a_Menu_to_a_Menu  
Bar_howto;Adding_a_MenuItem_to_a_Menu_howto;Adding_a_Submenu_howto;Editing_menu_structure_howto;Binding_Code_  
to_a_Menu_Command_howto;Property_Inspector_using_F1;Object_Library_F1',0,',')}
```

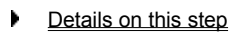
You can quickly add command keys to menu items.

1. Select a menu item in the Project window or Menu Designer.
2. In the Property List, expand the Menu Shortcut property and specify the command key(s) in the Key Code and Use Shift Key fields.

The Key Code field lets you specify what keys you want to use, for example, VK\_P selects CTRL+P. In the Menu Designer and Project window, this key sequence displays as "CTRL+Kanji."

If you want the SHIFT key to be part of the command key sequence, choose true; otherwise, choose false.

3. Verify your command keys by running your Java program.



[Details on this step](#)



## Editing a menu structure

```
{button Concepts,AL('Using_the_Menu_Editor_F1;Component_Properties_overview',0,'')} {button See  
Also,AL('Popup_menu_MenuEditor_F1;Editing_Menus_howto;Adding_a_Menu_to_a_Form_howto;Adding_a_Menu_to_a_Menu  
Bar_howto;Adding_a_MenuItem_to_a_Menu_howto;Adding_a_Submenu_howto;Adding_menu_command_keys_howto;Binding  
_Code_to_a_Menu_Command_howto;Property_Inspector_using_F1;Object_Library_F1',0,'')}
```

You can change the menu structure as needed.

### To move items in the menu structure

- Move items in the Menu Designer or Project window to visually change it.

### To delete a menu or menu item

- Select the component in the Menu Designer or Project window, then press DELETE or choose Edit ► Delete.

**Note** If you delete a component from a container, you must manually delete any [custom code](#), [interactions](#), and [event bindings](#) involving that component.

## ▶ Binding code to a menu item

```
{button  
Concepts,AL(`Visual_Caf_Tools_for_Working_with_Classes_and_Components;Using_the_Menu_Editor_F1;Component_Propert  
ies_overview',0,',';')} {button See  
Also,AL(`Popup_menu_MenuEditor_F1;Editing_Menus_howto;Adding_a_Menu_to_a_Form_howto;Adding_a_Menu_to_a_Menu  
Bar_howto;Adding_a_MenuItem_to_a_Menu_howto;Adding_a_Submenu_howto;Adding_menu_command_keys_howto;Editing_  
menu_structure_howto;Property_Inspector_using_F1;Object_Library_F1',0,',';')}
```

Code can be bound to a menu item just as it can be bound to a component. Menu items respond to one event: `ActionEvent`. This event occurs when the user selects the menu command.

1. Open the menu bar in the Menu Designer or Project window.
2. Select the menu item.
3. Choose Edit Source from the pop-up menu.
4. In the Source window, select the Action event from the Event/Method drop-down list.
5. Add the appropriate Java code to the [event handler](#).

## Property List



## Working with component properties

```
{button How To,AL('Property_Inspector_using_F1',0,'')} {button See  
Also,AL('Form_Designer_F1;Properties_summary;Object_Library_F1;Projects_overview;Arranging_Objects_with_Layout_Managers;Arranging_Components_on_a_Form_howto',0,'')}
```

Each component has a set of properties that define its look and behavior. Visual Cafe provides a Property List from which you can directly modify these properties. When you change a property, the source code and Form Designer are immediately updated.

The Property List displays properties and values for the currently selected component or components. You can select a component from the Form Designer, Project window, Component Library, or the Property List pull-down menu. When multiple components are selected, only their common properties are shown and editable.

Properties with multiple values are marked with a plus sign (+); for example, the Font property. Properties that are defined using a dialog box are marked with the ellipsis button (...).

If you change the properties for a component in a project, only that project is affected. If you change the properties of a component in the Component Library, the change appears anytime you add the component to a project. Projects that already contained the component before the change are not affected.

Components may also have a customizer, a wizard-like interface bean developers use to help guide you through changing a component. See [Using a customizer to configure a component on a form](#) for more information.

### To display the Property List

- Choose View (or Window) ► Property List.



## Viewing and changing component properties

```
{button Concepts,AL('Component_Properties_overview;Arranging_Objects_with_Layout_Managers',0,'')} {button See  
Also,AL('Form_Designer_F1;Properties_summary;Object_Library_F1;Projects_overview;Arranging_Components_on_a_Form_h  
owto',0,'')}
```

Each component has a set of properties that define its look and behavior. Visual Cafe provides a Property List from which you can directly modify these properties. When you change a property, the source code and Form Designer are immediately updated.

To view or change the properties of components in a project, select one or more components in the Form Designer or Project window.

To view or change the properties of components in the Component Library and Palette, select one or more components in the Component Library. Remember that if you change the properties of a component in the Component Library, the change now appears every time you add that component to a project. Any projects that already contain the component before the change are not affected.

1. To display the Property List, choose View (or Window) ► Property List.
2. Select a component in the Form Designer, Project window, Component Library, or from the Property List pull-down menu. To select multiple components, CONTROL-click in the Form Designer, Project window, or Component Library, or Shift-click or drag in the Form Designer.

When multiple components are selected, only their common properties are shown and editable. In the Property List, you see the heading title "Multiple Selection."

3. To edit a property, click the right column, double-click the left column, or use TAB in the Property List.

The right column displays a list of valid values or makes the text string editable.

Properties with multiple values are marked with a plus sign (+); for example, the Font property. Click the + to expand the list.

Properties that are defined using a dialog box are marked with the ellipsis button (...). Click the ... button to get the dialog box.

4. Press ENTER or click somewhere else to make the change.

**Note** Press ESCAPE to cancel an edit and return the property to its previous value.

## Layout Managers

## Working with layout managers

```
{button How To,AL('Property_Inspector_using_F1;arranging_components_on_a_form_howto',0,'')} {button See  
Also,AL('Form_Designer_F1;Creating_Interactions;Projects_overview;Overview_of_Visual_Caf;Object_Library_F1;Differences_  
between_Applets_and_Applications;Understanding_Visual_Components;Layout property',0,'')}
```

When you do not use a layout manager, components are placed by exact pixel positions in a layout. In the Form Designer, you can do the following:

- Drag components on the Form Designer to position them.
- Explicitly set x and y coordinates in the Property List.
- Arrange objects with the Align, Center, Space Evenly, Make Same Size, Bring to Front, and Send to Back menu items of the Layout menu.
- Use the Form Designer grid, which you can set by choosing Layout ► Grid Options.
- Move a component pixel-by-pixel by selecting the component on the Form Designer and pressing the right, left, up, and down arrow keys as needed.

Java also provides layout managers that help you arrange [components](#) inside a [container](#) so the appearance adjusts automatically across platforms and Web browsers, and at varied screen sizes and resolutions:

### BorderLayout

Arranges the components in a center, north, south, east, and west orientation. It positions components based on their preferred sizes and the constraints of the container size.

### CardLayout

Arranges the components on several cards. Only one card is visible at a time, which allows you to flip through the cards. A component will be sized to take up an entire card; if you want multiple components on a card, place components on panels. That way, the panel will take up the entire card.

### FlowLayout

Arranges components in a row from left to right until there is no more room, then it starts the next row. You can specify center, left, or right alignment, as well as the horizontal and center gaps.

### GridLayout

Arranges components in definable rows and columns. This layout is similar to FlowLayout except each component is in an area of equal size. You can specify the number of rows and columns, as well as the horizontal and center gaps between components.

### GridBagLayout

Arranges objects by size and space. Like GridLayout, GridBagLayout treats the form or panel as a grid of cells. Unlike GridLayout, however, a component can occupy more than one cell.

You specify a layout for a container by setting the Layout property. You can arrange components in a layout by dragging and dropping to a new location in the Form Designer, changing the component order in the Project window, or changing properties for a component or the container — depending on the layout manager you are using.

## Arranging components in the Form Designer

```
{button Concepts,AL('Arranging_Objects_with_Layout_Managers;GUI_development_with_Visual_Caf',0,','')} {button See Also,AL('Layout property;Forms_adding_objects;Layout_Menu_F1;Form_Designer_F1;Using_the_Grid_Options_Dialog_F1;Arranging_Components_on_a_Form_howto;Property_Inspector_using_F1;Form_Designer_F1',0,','')}
```

Visual Cafe provides [layouts](#) (also called layout managers) to help you organize components on a [form](#) or in a [panel](#). You can group components in panels on your form and use different layout managers to suit the components contained by the panel.

### To choose a layout manager

1. Open the Property List for a form or panel.
2. Select a layout for the Layout property.

The Form Designer immediately reflects the layout by rearranging the components based on the order in which they appear in the Project window. Or, you might have to position components first.

3. Rearrange the components in the Form Designer, if needed.

### To arrange components in a layout manager of None

When you choose a layout of None, components are placed by exact pixel positions on a form or panel. In the Form Designer, you can do the following:

- Drag components on the Form Designer to position them.
- Explicitly set x and y coordinates in the Property List.
- Arrange objects with the Align, Center, Space Evenly, Make Same Size, Bring to Front, and Send to Back menu items of the Layout menu.
- Use the Form Designer grid, which you can set by choosing Layout ► Grid Options. See [Manipulating the Form Designer grid](#) for more information.
- Move a component pixel-by-pixel by selecting the component on the Form Designer and pressing the right, left, up, and down arrow keys as needed.

You should test your layout by running it on different operating systems and screens, as applicable. For maximum portability, it is sometimes best to not overlap components in your layout.

### To arrange components in BorderLayout

Use BorderLayout to arrange components in a center, north, south, east, and west orientation. It positions components based on their preferred sizes and the constraints of the container size.

1. Choose BorderLayout for the Layout property of a form or panel.
2. If components are already on the form or panel, rearrange components, as needed. Set the Placement property for each component you want to position.

**Note** In the BorderLayout, no components should have the same Placement value.

3. In the Property List, choose the form or panel component, then set the Horizontal Gap and Vertical Gap properties to adjust the layout.
4. For each component you want to add, add the new component, then set its Placement property to place it on the form or panel.

When you first add a component, its Placement property is blank (which is the same as CENTER).

5. Test your layout by running it at different form sizes and resolutions. For example, you can resize the form when you run it from Visual Cafe.

### To arrange components in CardLayout

Use CardLayout to arrange components on several cards. Only one card is visible at a time, which allows you to flip through the cards. A component will be sized to take up an entire card; if you want multiple components on a card, place components on panels. That way, the panel will take up the entire card.

1. Choose CardLayout for the Layout property of a form or panel.

If components are already on the form or panel, each component directly subordinate to the form or panel becomes a separate card. The cards are placed in the order they appear in the Project window.

2. In the Property List, choose the form or panel component, then set the Horizontal Gap and Vertical Gap properties to adjust

the layout.

3. If components are already on the form or panel, rearrange components in the Form Designer or Project window, as needed:
  - To change the card order, change the component order in the Project window.
  - To flip between cards in the Form Designer, right-click then choose Previous Card or Next Card.
4. Add components as needed and rearrange them.
5. Test your layout by running it at different form sizes and resolutions. For example, you can resize the form when you run it from Visual Cafe.

#### **To arrange components in FlowLayout**

Use FlowLayout to arrange components in rows from left to right. You can specify center, left, or right alignment, as well as the horizontal and center gaps between components.

1. Choose FlowLayout for the Layout property of a form or panel.

The Form Designer immediately reflects the layout by rearranging the components based on the order in which they appear in the Project window.
2. In the Property List, choose the form or panel component, then set the Alignment, Horizontal Gap, and Vertical Gap properties to adjust the layout.
3. If components are already on the form or panel, rearrange components in the Form Designer or Project window, as needed.
4. Add components as needed and rearrange them.
5. Test your layout by running it at different form sizes and resolutions. For example, you can resize the form when you run it from Visual Cafe.

#### **To arrange components in GridLayout**

Use GridLayout to arrange components in definable rows and columns. This layout is similar to FlowLayout except each component is in an area of equal size. You can specify the number of rows and columns, as well as the horizontal and center gaps between components.

1. Choose GridLayout for the Layout property of a form or panel.

The Form Designer immediately reflects the layout by rearranging the components based on the order in which they appear in the Project window.
2. In the Property List, choose the form or panel component, then set the Rows, Columns, Horizontal Gap, and Vertical Gap properties to adjust the layout.

If you set either Rows or Columns to zero, GridLayout computes the other value for you. If both Rows and Columns are nonzero, the Rows value is used.
3. If components are already on the form or panel, rearrange components in the Form Designer or Project window, as needed.
4. Add components as needed and rearrange them.
5. Test your layout by running it at different form sizes and resolutions. For example, you can resize the form when you run it from Visual Cafe.

#### **To arrange components in GridBagLayout**

Use GridBagLayout to arrange components by size and space. Like GridLayout, GridBagLayout treats the form or panel as a grid of cells. Unlike GridLayout, however, a component can occupy more than one cell.

1. Choose GridBagLayout for the Layout property of a form or panel.

The Form Designer immediately reflects the layout by rearranging the components based on the order in which they appear in the Project window.
2. Rearrange and add components as needed. In the Property List, choose a component, then set the Grid Bag Constraints properties to adjust its place in the layout. You can think of these properties as “suggestions” that GridBagLayout uses.

Press F1 on a Grid Bag Constraints property to get a description of it. Insets specify how much space to leave between the borders of a component and its display area.
3. Test your layout by running it at different form sizes and resolutions. For example, you can resize the form when you run it from Visual Cafe.



## Manipulating the Form Designer grid

```
{button Concepts,AL(^Arranging_Objects_with_Layout_Managers;GUI_development_with_Visual_Caf,0,','')} {button See  
Also,AL(^Form_Designer_F1;Property_Inspector_using_F1;Arranging_Components_on_a_Form_howto;Layout_Menu_F1',0,','')  
}
```

While designing a [form](#), the Form Designer grid is useful in laying out the form components.

### To open the Grid Options dialog box

- While a Form Designer is the active window, choose Layout ► Grid Options.

### To enable or disable grid display

- In the Grid Options dialog box, select or deselect Show Grid.

### To enable or disable the snap-to-grid capability

This option automatically aligns components to the grid when moving, sizing, and creating them.

- In the Grid Options dialog box, select or deselect Snap to Grid.

### To set the grid spacing

- In the Grid Options dialog box, type the amount of space between grid points, both horizontally and vertically.

## Obsolete Topics

## Changing component properties

```
{button Concepts,AL('Component_Properties_overview;Property_Inspector_using_F1')} {button See  
Also,AL('Properties_summary;Property_Inspector_using_F1;Arranging_Components_on_a_Form_howto',0,',')} }
```

Within the Property List you can modify the [properties](#) of top-level components. When multiple components are selected, only common properties of the selected objects are shown and editable.

1. Select an object in the Form Designer or from the drop-down list box.
2. Click the appropriate property in the left column.

The right column activates and displays a list of valid values or the text string is made editable. Properties that have the "+" symbol next to their name are multiple value properties. When you edit these properties, either a dialog box displays or the individual property list expands.

3. Make the desired changes.
4. Press ENTER or select another property to save the changes.

**Note** Pressing the ESC key cancels any edits and returns the property to its previous value setting.

Property changes are immediately effective. If you change the properties of an object in the Component Library, you see the changes the next time that you use the object.





## Changing the component displayed in the Property List

```
{button Concepts,AL('Component_Properties_overview',0,'')} {button See Also,AL('Property_Inspector_using_F1',0,'')}
```

Within the Property List you can change the current component by selecting the component's name for the Property List's drop-down list.

If the Form Designer is open, any changes that you make are dynamically reflected.

To select multiple components, you must select them in the Form Designer by CONTROL-clicking the desired components, SHIFT-clicking, or dragging to select.



## Viewing multiple property sets simultaneously

```
{button Concepts,AL('Property_Inspector_using_F1',0,'')} {button See Also,AL('Property_Inspector_using_F1',0,'')}
```

You can view the properties of multiple components at the same time. Only a subset of the properties common to all selected components displays.

1. In the Form Designer, CONTROL-click the components that you want to edit as a group.  
In the Property List, you see the heading title "Multiple Selection."
2. Change properties as needed.  
The change is applied to all selected components.



## Modifying an object's properties

```
{button Concepts,AL('Property_Inspector_using_F1',0,'')} {button See  
Also,AL('Connecting_Form_components_howto;Forms_adding_objects',0,'')}
```

Property values are changed in the Property List.

1. In the Form Designer, select an object.
2. Choose View (or Window) ► Property List.
3. In the Property List, click the property that you want to modify.
4. Edit the value directly in the property field or change the value by using the dialog box that displays when you click the ... button.

## Understanding the Component Library

```
{button How  
To,AL('binding_code_to_a_form_component_howto;deleting_objects_from_the_object_library_howto;Adding_Bean_to_Library_  
howto;adding_objects_to_the_palette_howto;deleting_objects_from_the_palette;Palette_F1',0,','')} {button See  
Also,AL('Form_Designer_F1;Projects_overview;Overview_of_Visual_Caf;Understanding_Visual_Components;Using_Visual_Caf_  
_as_Your_Development_Environment',0,','')}
```

The Component Library window contains all the [components](#) in the Component Library. The Component Library can be used to add items to projects, [forms](#), and to the palette. Components defined in a [.class file](#) can be dragged and dropped from the File Manager onto the Component Library to make them permanent components in the library. The default Component Library is installed in the Visual Cafe library directory.

### Adding components to the Component Library

Forms and applets, as well as menu bars and other types of components, can be saved and reused. To save a form as a reusable component, you activate the form window and choose Add to Library from the Object menu. This opens a dialog box where you can enter a name and description and select an icon for the form template.

The Add to Library command adds the component to the Visual Cafe Component Library. When you add a component to the library, all aspects of the component are saved, including any child components such as a form, code, and current property settings.

## Creating and adding components to forms

```
{button How  
To,AL('form_designer_f1;Adding_Code_to_a_Java_Source_File_howto;binding_code_to_a_form_component_howto;displaying_  
invisible_components_howto;creating_a_form_howto',0,'')} {button See  
Also,AL('Creating_Interactions;Layout_Managers;Projects_overview;Understanding_Visual_Components;Understanding_Works  
paces;Working_Visually_with_Visual_Caf;The_Development_Life_Cycle_A_Two_Step_Process',0,'')}
```

Forms are the basis for creating a user interface to your applets and applications. With forms, you can create and add [components](#) like windows, dialog boxes, graphics, and sound to your applets and applications. You can also use forms as [containers](#) for items that are not visible components in a user interface. For example, you can have a form in an application that serves as a container for other components that will be used in other programs. Or, you can have a container with code that handles [events](#) like mouse interactions.

Forms are also windows that display information and can receive user input. A form can contain labels that display text, or can contain components that provide interaction with the program. Some examples of components are:

- Check Boxes
- Radio Buttons
- Text Boxes
- Scroll Bars

To add a component to a form, select the component from the Component Palette and drag it into the Form Designer. The Component Palette contains a variety of components that you can add to forms including standard Java window components. Visual Cafe also includes an extensive list of custom and third-party components.



## Copying components

```
{button Concepts,AL('Form_Designer_F1',0,'')} {button See  
Also,AL('Forms_adding_objects;Connecting_Form_components_howto',0,'')}
```

You can copy components and menu bars to another form, within the same form, or to another project by:

- dragging and dropping the component to the target form
- copying and pasting the component with menu commands and the toolbar
- selecting the component and using the Copy and Paste pop-up menu commands

### Notes

- The object's bound events are not moved to the new location.
- You must manually move any code to the new form.
- Forms and components must have unique names. If necessary, an object is renamed when pasted.



## Moving components between forms

```
{button Concepts,AL('Form_Designer_F1;Projects_overview',0,','')} {button See  
Also,AL('Forms_adding_objects;Property_Inspector_using_F1;Connecting_Form_components_howto;Copying_a_component_h  
owto;Form_Designer_F1',0,','')}
```

You can move a component to another form by either of these methods:

- In the Project window, drag the component on top of the new form.
- In the Form Designer, cut and paste the component.

### Notes

- Moving a component to another form does not move the associated code. You need to delete any code that references the component and add it to the new form's source code.
- In the Form Designer, dragging a component from one form window to another moves the component.
- The object's bound events are not moved to the new location. You must manually move the code to the new class.
- Forms cannot be moved into another form.



## Deleting components from a form

```
{button Concepts,AL('Form_Designer_F1',0,'')} {button See  
Also,AL('Forms_adding_objects;Deleting_a_connection_howto',0,'')}
```

Components are deleted using one of these methods:

- Select the component and press DELETE
- From the Project window, expand the object listing of the form that you want to edit, select the component, and press DELETE





## Editing a form

```
{button Concepts,AL('Form_Designer_F1',0,'')} {button See Also,AL('Deleting_Objects_from_a_Project_howto',0,'')}
```

All form editing is done in the Form Designer. Some editing tasks that you may want to perform are:

[Adding components to a form](#)

[Deleting components from a form](#)

[Modifying a component's properties](#)

[Adding a connection between two components](#)

[Adding a component to the Visual Cafe library](#)

[Arranging components on a form](#)

[Enabling and disabling the grid](#)

[Enhancing an object's Java code](#)

[Displaying invisible components](#)



## Copying a menu

```
{button Concepts,AL('Form_Designer_F1',0,'')} {button See  
Also,AL('Adding_a_Menu_to_a_Form_howto;Copying_a_component_howto;Forms_adding_objects;Connecting_Form_compon  
ents_howto;Property_Inspector_using_F1',0,'')}
```

Copying menus allows you to reuse menus that are common among forms and projects.

1. To open the Menu Designer, double-click the menu bar component on a form or in the Project window.
2. In the Menu Designer, click the menu that you want to copy.
3. Choose Edit ► Copy.
4. Open the target form and double-click the target menu bar component.  
The component displays in the Menu Designer.
5. Select a location for the new menu. You can paste a menu to the top-level or within a menu to create a hierarchical menu.
6. Choose Edit ► Paste.

**Importing foreign files into Visual Cafe (Adding an existing file to a project and Adding packages to Visual Cafe are in project.doc)**



## Importing Cafe projects into Visual Cafe

```
{button Concepts,AL('Projects_overview',0,'','concept')} {button See  
Also,AL('Closing_a_project_howto;Opening_a_Project_howto;Creating_a_Project_howto',0,'','visual')}
```

Your Cafe project is converted automatically when you open it with Visual Cafe.

**Warning** Converted projects cannot be saved back into Cafe format. However, you can move Java source files between Cafe and Visual Cafe.

## Importing Visual J++ projects into Visual Cafe

{button Concepts,AL('Considerations\_import\_J++\_concept;Projects\_overview',0,'','concept')} {button See Also,AL('Closing\_a\_project\_howto;Opening\_a\_Project\_howto;Creating\_a\_Project\_howto;Saving\_Renaming\_Copying\_a\_Project\_howto',0,'','')} }

Your Visual J++ project is converted automatically when you open the workspace (**dsw**) or project (**dsp**) file with Visual Cafe. If you open the workspace file, some of your workspace options (stored in an **opt** file) are preserved; these settings might be lost if you open the project file directly.

For a more complete list of considerations, see [Considerations when importing Visual J++ projects](#).

### To import a project through the dsw workspace file

When Visual Cafe converts a project through the workspace file, it gives the project the same name as the workspace and saves it immediately in the same directory as the workspace. So if multiple projects are in your workspace, you should convert the projects that are in their own directories first, then convert the project in the same directory as the workspace file. It is best to work from a copy of your Visual J++ files instead of the originals.

1. Choose File ► Open.  
The Open dialog box displays.
  2. Navigate to the directory with the **dsw** file for the project you want to import.
  3. Choose Visual J++ Workspace Files in the Files of type field.  
The **dsw** and **dsp** files display.
  4. Select the **dsw** file from the list. Then click Open.
  5. If there is more than one project in the workspace, a dialog box appears that asks what project you want to convert. Select the project, then click OK.
  6. If you have more than two configurations defined for the project, or if you have two configurations and neither of them are named "Debug," a dialog box appears that asks what configuration you want to use for the Visual Cafe Debug and Final option sets. Select the configuration and click OK in each dialog box.  
The project is converted and opens in a Visual Cafe Project window.
  7. Review the Visual Cafe project options and change them as needed.
- [Details on this step](#)
8. If the Visual Cafe project was in a different directory than the **dsw** file, choose File ► Save As to save your new project to the directory where the project **dsp** file is. If you want, you can rename the project at the same time.
- [Details on this step](#)
- If you save the project to another directory, you could delete the Visual Cafe project files in the same directory as the workspace. Or you can just let them be overwritten when you import the next project.

### To import a project through the dsp project file

It is best to work from a copy of your Visual J++ files instead of the originals.

1. Choose File ► Open.  
The Open dialog box displays.
  2. Navigate to the directory with the **dsp** file for the project you want to import.
  3. Choose Visual J++ Workspace Files in the Files of type field.  
The **dsw** and **dsp** files display.
  4. Select the **dsp** file from the list. Then click Open.
  5. If you have more than two configurations defined for the project, or if you have two configurations and neither of them are named "Debug," a dialog box appears that asks what configuration you want to use for the Visual Cafe Debug and Final option sets. Select the configuration and click OK in each dialog box.  
The project is converted and opens in a Visual Cafe Project window.
  6. Review the Visual Cafe project options and change them as needed.
- [Details on this step](#)
7. Save your new project.

► [Details on this step](#)

## Considerations when importing Visual J++ projects

```
{button How To,AL('Importing_VJ++_howto',0,'')} {button See  
Also,AL('Closing_a_project_howto;Opening_a_Project_howto;Creating_a_Project_howto;Projects_overview',0,'')}
```

Your Visual J++ project is converted automatically when you open a workspace file (**dsw**) or project file (**dsp**) with Visual Cafe. While Visual Cafe has projects, Visual J++ has workspaces that contain projects. A workspace is made of a workspace file and an **opt** options file. Information about the projects a workspace contains is stored in a project file (one per project) and the options file. Because the name of the options file is not stored in the project file, it is usually better to import projects through the workspace file rather than the project file.

The following options are preserved from the Visual J++ **opt** file when:

- you import a project through the **dsw** file or
- you import a **dsp** file that has the same name as the **opt** file and the **opt** file is in the same directory.

| <u>Visual Cafe project option...</u>            | <u>Visual J++ configuration that sets it...</u>                                                                                                                              |
|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Project type</b> field in Project tab        | The <b>Debug/Execute project under Browser</b> and <b>Standalone interpreter</b> options determine the setting.                                                              |
| <b>Start with Web page</b> field in Project tab | The <b>Use parameters from HTML page</b> value is used; or the <b>Enter parameters below</b> option tells Visual Cafe to use Automatic.                                      |
| <b>Main class</b> field in Project tab          | The <b>Class for debugging/executing</b> value is used.                                                                                                                      |
| <b>Runtime arguments</b> field in Project tab   | The <b>Program arguments</b> value is used.                                                                                                                                  |
| <b>Class Files</b> list in Directories tab      | The <b>Class path directories</b> setting is used. Note that in Visual Cafe the <b>Append class path</b> and <b>Autogenerate class path</b> options are selected by default. |

The following options are preserved from the **dsp** project file, whether you open a workspace or project file.

| <u>Visual Cafe project option...</u>                     | <u>Visual J++ configuration that sets it...</u>                                                                        |
|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| <b>Output directory</b> field in Directories tab         | The <b>Output directory</b> value is used.                                                                             |
| <b>Show compiler warnings</b> option in Compiler tab     | A <b>Warning Level</b> of None tells Visual Cafe to deselect the option; any other value means the option is selected. |
| <b>Generate debug information</b> option in Compiler tab | The <b>Generate Debug info</b> value is used.                                                                          |

Here are some more considerations when importing Visual J++ projects:

- If you want to maintain your Visual J++ workspace and projects, you should copy the files to another directory before conversion.
- Converted projects cannot be saved back into Visual J++ format.
- Only Visual J++ version 1.1 workspace and project files can be imported. However, you can add Java source files created in another product to a Visual Cafe project. For instructions, see [Adding an existing file to a project](#).
- Visual Cafe can read Visual J++ **java** files that are 100% pure Java, without proprietary Java extensions implemented by Microsoft.
- **class** files compiled with Visual Cafe might not be compatible with Visual J++, so you probably want to make sure your output directories are different for each product.
- You cannot import projects that use variable persistence, such as having the location of a file be stored as `d:\mysource\$(SRCDIR)a.java`, where `SRCDIR` is an environment variable and `a.java` is the file. In Visual Cafe, you cannot use environment variables to control where Visual Cafe looks for a **java** file. If you want to import a project that uses variable persistence, you

need to remove variable persistence before importing the project into Visual Cafe.

- While Visual J++ lets you specify a different project type, applet or application, for different configurations, Visual Cafe supports one project type per project. If the project type is different for the debug and final option sets, Visual Cafe uses the project type specified for debug.

**Note** In Visual Cafe Professional edition, you can choose to use Visual J++ keyboard shortcuts by specifying them in your Visual Cafe Environment Options. See [Mapping Visual Cafe commands to key sequences](#) for more information.

**Tip** In Visual Cafe, when you close the Project window, the project closes. Whereas in Visual J++, when you close the Workspace (a project), just the window closes.



## Top of ctaskpro.doc

This is the top of the ctask.doc file. This file contains procedures for working with components from the Component Library. This file is new to the help project for release 1.01d

11/97: Rewrote for JDBC subprotocols ODBC and dbAW. Also corrected some display and naming problems, and added browse sequences.

**Main index entry**

Please click on a sub index entry for topic information.

**Main index entry**

Please click on a sub index entry for topic information.

## Grids

## Adding a Grid component

```
{button Concepts,AL('Database Development Edition_Extension_Overview;dbNAVIGATOR_window',0,','')} {button See  
Also,AL('Grid_component;RelationView_component;dbAWARE_Binding_property;dbAWARE_Join_property;Adding_a_Grid_co  
mponent_to_a_form_as_a_detail_view;Changing_Grid_Cell_Attributes;Changing_Grid_column_attributes;Defining_automatic_G  
rid_row_numbering;Defining_automatic_Grid_redraw;Modifying_the_Grid_toolbar')}
```

To add a Grid component, follow these steps:

1. Drag the table icon, from the dbNAVIGATOR window, onto the form.  
Visual Cafe then automatically creates all other components that are needed to define the database connection; such as the [ConnectionManager](#) and [JdbcConnection](#) components or the [Session](#) and [ConnectionInfo](#) components.  
The columns display in the Grid, from left to right, in the same order that they appear in dbNAVIGATOR .
2. Drag the Grid component from the Component Library or Palette to add it to your form.  
The Grid is empty. You do not see the actual data until run time.
3. Size the Grid as appropriate.  
If query columns do not fit within the Grid component, a scroll slider is provided.
4. Adjust the column widths by positioning the cursor on the column heading until a double-edge arrow displays. Then drag the column border line left or right.  
**Note** Column heading text can be customized in code only.
5. Set the Grid component's Data Binding property, which includes the [QueryNavigator](#) alias name or [RelationView](#) object name of the component that was created in step 1. You can leave the Field Name blank to get all fields, or specify one or more fields delimited with a comma (,).  
**Note** The Alias Name is a property in the Property List; it might not match the object name. You can enter a name that does not exist yet. The QueryNavigator you enter does not have to be contained by the same form as the component.
6. To run the form, choose Project ► Execute.  
The Grid component uses the database column names as the Grid column headings.  
You can narrow the query by adjusting the SELECT statement. See [Specifying SQL SELECT statements](#) for more information.

## Changing Grid cell attributes

```
{button Concepts,AL('Database Development  
Edition_Extension_Overview;Customizing_Database_Development_Edition_code',0,'')} {button See  
Also,AL('Grid_component;Adding_a_Grid_component_to_a_form_as_a_detail_view;Changing_Grid_column_attributes;Changin  
g_Grid_column_attributes;Defining_automatic_Grid_row_numbering;Defining_automatic_Grid_redraw;Modifying_the_Grid_toolb  
ar;Adding_Code_to_a_Java_Source_File_howto',0,'')}
```

You may want to change the visual attributes, such as color, font, and row highlight color, of grid cells. To change these attributes, you modify the component's source code. Place any custom source code after the INIT\_CONTROLS code block.

### Foreground and background colors

The Property List does not provide a property to control the foreground and background colors of Grid cells. You must specify these attributes in code.

Following is a code sample that changes the cell background and foreground colors. The setCellBgColor and setCellFgColor methods take as arguments a row number, a column number, and a new color.

**Note** Cell row and cell column numbers are one-based, not zero-based.

```
grid1.setCellBgColor(1, 1, Color.blue);  
grid1.setCellFgColor(1, 1, Color.white);
```

You can also change the color of an entire row or column of cells. The method arguments are a row (or column) number and a color:

```
grid1.setColBgColor(1, Color.blue);  
grid1.setColFgColor(1, Color.white);  
grid1.setRowBgColor(1, Color.red);  
grid1.setRowFgColor(1, Color.white);
```

### Fonts

You may want to change the font of a cell or range of cells for emphasis. Following are some examples that illustrate how to change cell, column, and row fonts:

```
grid1.setCellFont(2, 2, new Font ("Helvetica", Font.PLAIN, 14));  
grid1.setColFont(1, new Font ("TimesRoman", Font.ITALIC, 18));  
grid1.setRowFont(1, new Font ("Courier", Font.BOLD, 16))
```

The arguments are the column number (columns are one-based, not zero-based) and a color as defined in the java.awt.Color class.

## Changing Grid column attributes

```
{button Concepts,AL('Database Development  
Edition_Extension_Overview;Customizing_Database_Development_Edition_code',0,,'')} {button See  
Also,AL('Grid_component;Adding_a_Grid_component_to_a_form_as_a_detail_view;Changing_Grid_Cell_Attributes;Protecting_a  
_Grid_column;Defining_automatic_Grid_row_numbering;Defining_automatic_Grid_redraw;Modifying_the_Grid_toolbar;Adding_  
Code_to_a_Java_Source_File_howto',0,)}
```

You can change attributes of Grid columns, such as heading names, column alignments, heading colors, and heading fonts, by enhancing the Grid component's Java code. Place any custom source code after the INIT\_CONTROLS code block.

### Changing column headings

You can change column headings by adding custom code, as follows:

```
grid1.setHeading ("Last Name", 1, 15);  
grid1.setHeading ("First Name", 2, 15);
```

The third setHeading argument specifies the width of the column in average character widths.

### Changing the column alignment

You can also modify column alignment. The method arguments are the column number and the alignment type. The alignment can be specified by static final int values attached to the Grid class:

```
grid1.setColumnAlignment (1, grid1.LEFT);  
grid1.setColumnAlignment (2, grid1.CENTER);  
grid1.setColumnAlignment (3, grid1.RIGHT);
```

### Changing column heading colors and fonts

You can modify column heading and font attributes. The setHeadingColor method changes the foreground and background colors of a column heading. The setHeadingFont method changes the font of a column heading:

```
grid1.setHeadingColors (1, Color.black, Color.white);  
grid1.setHeadingFont (new Font("TimesRoman", Font.BOLD, 18), 1);
```

## Defining automatic Grid redraw

```
{button Concepts,AL('Database Development  
Edition_Extension_Overview;Customizing_Database_Development_Edition_code',0,,'')} {button See  
Also,AL('Grid_component;Adding_a_Grid_component_to_a_form_as_a_detail_view;Changing_Grid_Cell_Attributes;Protecting_a  
_Grid_column;Changing_Grid_column_attributes;Defining_automatic_Grid_row_numbering;Modifying_the_Grid_toolbar;Adding_  
Code_to_a_Java_Source_File_howto',0,)}
```

Each time a grid component is updated, it is automatically redrawn. If you are going to make several changes to your grid (column headings, cell color changes, and so on) it is a good idea to turn off the automatic redraw capability. Once you have made all your changes, you can turn it back on again:

```
grid1.setAutoRedraw (false); // turns off auto-redraw  
// make changes to the grid here  
grid1.setAutoRedraw (true); // turns on auto-redraw
```

Place any custom source code after the INIT\_CONTROLS code block.

## Defining automatic Grid row numbering

```
{button Concepts,AL('Database Development  
Edition_Extension_Overview;Customizing_Database_Development_Edition_code',0,','')} {button See  
Also,AL('Grid_component;Adding_a_Grid_component_to_a_form_as_a_detail_view;Changing_Grid_Cell_Attributes;Protecting_a  
_Grid_column;Changing_Grid_column_attributes;Defining_automatic_Grid_redraw;Modifying_the_Grid_toolbar;Adding_Code_to  
_a_Java_Source_File_howto',0,)}
```

Automatic row numbering can be turned on or off. When activated, the starting row number can be set by using the `setupAutonumbering` method, for example:

```
grid1.setupAutonumbering (1); // begins auto-row numbering at 1  
grid1.setupAutonumbering (5); // begins auto-row numbering at 4  
grid1.setupAutonumbering (0); // turns off auto-row numbering
```

Place any custom source code after the `INIT_CONTROLS` code block.



## Modifying the Grid toolbar

```
{button Concepts,AL('Database Development  
Edition_Extension_Overview;Customizing_Database_Development_Edition_code',0,','')} {button See  
Also,AL('Grid_component;Adding_a_Grid_component_to_a_form_as_a_detail_view;Changing_Grid_Cell_Attributes;Protecting_a  
_Grid_column;Changing_Grid_column_attributes;Defining_automatic_Grid_row_numbering;Adding_Code_to_a_Java_Source_F  
ile_howto',0,')}
```

You can add additional functionality to a Grid toolbar by

- creating a customized Grid [event handler](#) with the added functionality
- then informing the Grid about the new event handler

Each grid component has a DefaultTvEventHandler object that provides the standard functionality of the Grid: Insert, Go To, Undo, Restart, Delete, Undelete, and Save. Additional functions are made through a custom EventHandler object that extends from the DefaultTvEventHandler.

Place any custom source code after the INIT\_CONTROLS code block.

### Adding search capability

The following example adds a few components to the toolbar and implements a standard search capability within a column. New features include a search field, a forward and backward search direction radio button, and a Go button (to start the search).

1. Create a basic project with a Grid.
2. When the Grid is functional and displays data, add import statements at the top of the Grid source code:

```
import symantec.itools.db.awt.Grid;  
import symantec.itools.db.awt.Coordinate;  
import symantec.itools.db.awt.DataNotAvailable;  
import symantec.itools.db.awt.DefaultTvEventHandler;
```

These import statements provide the necessary classes to create the custom event handler.

3. Add the following code for a custom event handler. Code notes follow the code sample.

```
1: class MyEventHandler extends DefaultTvEventHandler {  
2:     TextField tfSearch;  
3:     Checkbox  cbNext, cbPrev;  
4:     Button    btnGo;  
5:     Grid      grid;  
6:  
7:     public void setupView (Grid gr) {  
8:         super.setupView(gr);  
9:         grid = gr;  
10:  
11:         gr.addToToolbar (tfSearch = new TextField(15));  
12:         CheckboxGroup cbg = new CheckboxGroup();  
13:         gr.addToToolbar (cbNext = new Checkbox("Next", cbg,  
true));  
14:         gr.addToToolbar (cbPrev = new Checkbox("Prev", cbg,  
false));  
15:         gr.addToToolbar (btnGo = new Button("Search"));  
16:     }  
17:  
18:     public boolean handleToolbarEvent (Event e) {  
19:         if (e.target == tfSearch && e.id == e.ACTION_EVENT) {  
20:             findSubstring(tfSearch.getText(), 1,  
cbNext.getState());  
21:             return true;  
22:         } else if (e.target == btnGo && e.id == e.ACTION_EVENT) {  
23:             findSubstring(tfSearch.getText(), 1,  
cbNext.getState());  
24:             return true;  
25:         }  
26:         return super.handleToolbarEvent(e);  
27:     }  
28:  
29:     void findSubstring(String query, int col, boolean forward) {  
30:         if (col < 0 || col >= grid.getNumberOfCols()) {
```

```

31:         throw new IllegalArgumentException ("col="+col+1)+"
is not
32:         in view");
33:     }
34:     int start, stop = grid.getNumberOfVisibleRows() - 1;
35:     query = query.toUpperCase();
36:
37:     int step = forward ? 1 : -1;
38:     Coordinate curr = grid.getCurrentCellCoordinates();
39:     if (curr != null) {
40:         start = curr.row() + step;
41:     } else if (forward) {
42:         start = 0;
43:     } else {
44:         start = grid.getNumberOfVisibleRows() - 1;
45:         stop = 0;
46:     }
47:     int stringAt = -1;
48:     try {
49:         int index = -1;
50:         for (int row=start; row <=stop; row +=step) {
51:             String currText = grid.getCellText(row+1,
52:                 col+1).toUpperCase();
53:             index = currText.indexOf(query);
54:
55:             if (index != -1) {
56:                 stringAt = row + 1;
57:             }
58:         }
59:     } catch (DataNotAvailable ex) {
60:         ex.printStackTrace();
61:     }
62:
63:     if (stringAt != -1) {
64:         grid.setCurrentCell (stringAt, 2);
65:     } else {
66:         System.out.println("Did not find "+query);
67:     }
68: }
69: }

```

## Code Notes

Lines 11 through 15 add the new components to the toolbar.

Lines 18 through 27 act as the new `handleEvent` method for the Grid. While most of the standard grid events are dealt with internally, the `handleEvent` method deals with a Return key action even from the Search TextField or a press of the Search Go button. In both cases, the `findSubString` method is being called on to perform the search.

Lines 29 through 68 make up the `findSubString` method. The arguments to `findSubString` are:

- the text to search for
- the column to search within
- the direction to search (forward or backward)

This method searches through the specified column to find a cell containing a string that matches the search string (after conversion to uppercase).

Lines 30 through 33 assure that the column to search is within the range of actual columns in the grid. If the column to search is not within the actual columns within the grid, the `IllegalArgumentException` is thrown.

Line 34 declares the start and stop position variables for the search based on the number of rows available to search.

Line 35 converts the query to uppercase for the search.

Line 37 determines the step for the search depending on the direction of the search. If the search is a forward search, the step is set to positive value of 1. If the search is a backwards search, the step is set to a value of negative 1.

Lines 38 through 46 determine the starting and stopping point of the search.

Lines 47 through 61 start to check each cell in the given column to see if the cell contains a match to the search string. If not, the

next cell is selected and searched, and so on, until the search is successful or the search range has been exhausted.

Lines 62 through 67 either send a message to the console saying the search was unsuccessful or select the cell that contained the match.

### Plugging in the new capability

Once you have constructed the new `MyEventHandler` object, you must connect it to the existing `Grid` object. Use the `installEventHandler` method with an instance of the `MyEventHandler` object as a parameter, as shown here.

```
1:      . . .
2:      try {
3:          grid1 = new symantec.itools.db.awt.Grid(DBA_employee);
4:          grid1.addUndoButton();
5:          grid1.addDeleteButton();
6:          grid1.addUndeleteButton();
7:      } catch (symjava.sql.SQLException e) {
8:          System.out.println(e.getMessage());
9:          return;
10:     }
11:     grid1.reshape(24,12,528,327);
12:     keyPressManagerPanel1.add(grid1);
13:     //}}
14:     grid1.installEventHandler(new MyEventHandler());
15: }
```

### Code Notes

After adding the `Grid` to a project, lines 1 through 13 and 15 already exist. Line 14 was added to install the new `MyEventHandler` object to the grid component.

The line on which the `installEventHandler` method is placed is important. Notice that it is just below the line with the `//}}` tag. This tag declares the end of an area of code that is automatically maintained by Visual Cafe.

Any manual code placed inside the matching `//{{` and `//}}` tags may be removed by the Visual Cafe two-way development system when Visual Cafe does code maintenance. Placing the `installEventHandler` method outside the tags ensures that Visual Cafe does not remove or change your code.

## Protecting a Grid column

```
{button Concepts,AL('Database Development  
Edition_Extension_Overview;Customizing_Database_Development_Edition_code',0,,'')} {button See  
Also,AL('Grid_component;Adding_a_Grid_component_to_a_form_as_a_detail_view;Changing_Grid_Cell_Attributes;Changing_  
Grid_column_attributes;Defining_automatic_Grid_row_numbering;Defining_automatic_Grid_redraw;Modifying_the_Grid_toolbar;  
Adding_Code_to_a_Java_Source_File_howto',0,)}
```

You can protect cells, so that the user cannot modify the data, by enhancing the component's Java code. Like Grid cell colors, you can protect specific cells, a whole row, or a whole column. Place any custom source code after the INIT\_CONTROLS code block.

Following are some examples:

```
grid1.setCellEditable(1, 1, false);  
grid1.setColEditable(2, false);  
grid1.setRowEditable(2, false);
```

In the above syntax, the first argument is the column number and the second argument is Boolean, where false is read-only and true is read-write.

Obsolete



## Adding a Grid component to a form as a detail view

```
{button See Also,AL('Grid_component;dbAWARE_Join_property;dbAWARE_Binding_property',0,'','')}
```

You can define a [master/detail relationship](#) by adding a Grid component to a form as the detail view. Remember that you can get help on properties in the Property List by selecting a property and pressing F1. <<dbANYWHERE API only?>>

1. While the form is selected in the Project window, choose Insert ► Add Table Wizard.
2. Complete the wizard using only TextField components.  
Press F1 to get help on any wizard page.
3. In the Form Designer, delete all labels and fields that were automatically created for the table.
4. Drag a Grid component from the Component Library or Palette onto the form and size it appropriately.
6. Define the Grid's RelationView property. <<Doesn't work for JDBC API, right?>>



## Entering timestamp data

Timestamp data uses a 24-hour format.

If you enter

```
1997-02-05 11:00:00.000000000
```

then the value is interpreted by dbANYWHERE as 11:00am.

If you want the value of 1:00pm, enter

```
1997--02-05 13:00:00.000000000
```

Note that nine digits are used in the nanosecond position of the timestamp data, this is due to the java.sql.Timestamp class use of nine digits. Therefore, to enter 123 nanoseconds, you must pad the value with zeros. The value is:

```
000000123
```

**Native application, DLL, and library help topics (Project Options are in project.doc)**



## Creating native executables and DLLs

```
{button How  
To,AL('SNJREG_howto;Applications_native_step_overview;Applications_native_console_step_overview;DLLs_native_step_over  
view;Form_Designer_F1;Project_Options_dialog_F1;Deploying_Native_Applications_howto;Deploying_DLLs_howto',0,'')}  
{button See  
Also,AL('Projects_overview;Native_libraries_and_DLLs_overview;Linking_native_overview;Using_OPTLINK_and_SMAKE_over  
view',0,'')}
```

Visual Cafe Professional edition lets you create native Win32 Windows applications that run like any other application on a Windows computer. You do not need java.exe to run the application. You can also create native Win32 libraries (**lib** files) and Dynamic Link Libraries (DLLs).

Native libraries and DLLs are provided with Visual Cafe to help you develop and deploy native applications and DLLs. See [Native libraries and DLLs included with Visual Cafe](#) for more information.

Visual Cafe also has project templates to help you get started quickly with these tasks:

- [Assembling native GUI applications](#)
- [Assembling native console applications](#)
- [Assembling native DLLs](#)

Be sure to look in the Samples directory for detailed examples and instructions on how to create the examples.

## Native libraries and DLLs included with Visual Cafe

```
{button How  
To,AL('SNJREG_howto;Applications_native_step_overview;Applications_native_console_step_overview;DLLs_native_step_over  
view;Form_Designer_F1;Project_Options_dialog_F1;Deploying_Native_Applications_howto;Deploying_DLLs_howto',0,'')}  
{button See  
Also,AL('Projects_overview;Creating_native_overview;Linking_native_overview;Using_OPTLINK_and_SMAKE_overview',0,'')}
```

Visual Cafe Professional edition includes libraries and DLLs to support native application and DLL development.

| <b>Library</b> | <b>DLL</b>     | <b>Description</b>               |
|----------------|----------------|----------------------------------|
| Snjrt.LIB      | Snjrt11.DLL    | Core API                         |
| Snjbeans.LIB   | Snjbeans11.DLL | Beans                            |
| Snjres.LIB     | Snjres11.DLL   | Resource support including audio |
| Snjnet.LIB     | Snjnet11.DLL   | Networking and Internet support  |
| Snjmath.LIB    | Snjmath11.DLL  | Math                             |
| Snjzip.LIB     | Snjzip11.DLL   | Compression                      |
| Snjsec.LIB     | Snjsec11.DLL   | Security                         |
| Snjrmi.LIB     | Snjrmi11.DLL   | RMI                              |
| Snjawt.LIB     | Snjawt11.DLL   | AWT                              |
| Symbeans.LIB   | Symbeans.DLL   | Visual Cafe components           |
| Snjsql.lib     | Snjsql11.DLL   | Standard JDBC support            |

## ▶ Linking native Win32 applications

```
{button How  
To,AL('SNJREG_howto;Applications_native_step_overview;Applications_native_console_step_overview;DLLs_native_step_over  
view;Form_Designer_F1;Project_Options_dialog_F1;Deploying_Native_Applications_howto;Deploying_DLLs_howto',0,'')}  
{button See  
Also,AL('Projects_overview;Creating_native_overview;Native_libraries_and_DLLs_overview;Linking_native_overview;Using_OP  
TLINK_and_SMAKE_overview',0,'')}
```

For a native project to link, there may be extra steps you need to perform that you do not need to perform for a bytecode project. In bytecode programs, Java uses the classpath to dynamically and automatically resolve references to classes. However, in native applications, the Java classpath is not used to resolve these references. They must be resolved by static linking, which means they are resolved when the application is built.

Resolution by static linking occurs in the traditional compile/link mechanism. The object (**obj**) files, which are generated by the SJ compiler for each Java class, are linked together by the linker which resolves the references. The project system supplies the linker with the object files and libraries necessary to build your native Java executable. Linker errors will occur if the linker was unable to resolve some reference made to a class in your project. Typically, this means an object file corresponding to a class that your project uses did not get passed to the linker by the project system. Standard Java run-time libraries and Visual Cafe components are automatically supplied by the project system.

You need to get these symbols resolved by making them known to the linker. The simplest way to do this is to add the Java source file for any missing classes to your project. Other possible mechanisms include adding appropriate object files or import libraries to your project. Any symbols in source files, object files, or import libraries that are in your project will be passed to the linker and used to resolve references when you build an application. Various ways to do this are discussed in the linking examples in the Visual Cafe Samples directory.

As for bytecode programs, native Java applications allow programs to dynamically load arbitrary classes at runtime, without requiring them to be statically linked. However, classes that are not statically linked into your application at build time must exist in a separately compiled Dynamic Link Library (DLL) and be registered in the Windows registry by using the SNJREG tool.

## Registering DLLs with SNJREG

```
{button
Concepts,AL('Projects_overview;Creating_native_overview;Native_libraries_and_DLLs_overview;Linking_native_overview;Using_OPTLINK_and_SMAKE_overview',0,','')} {button See
Also,AL('Applications_native_step_overview;Applications_native_console_step_overview;DLLs_native_step_overview;Form_Designer_F1;Project_Options_dialog_F1;Deploying_Native_Applications_howto;Deploying_DLLs_howto',0,','')}
```

Unlike bytecode Java applications, native Win32 Java applications cannot use the classpath to find classes and packages. Instead, the Windows PATH is searched to locate classes and packages in DLLs. Classes that are dynamically loaded must be stored in the Symantec registry. Some packages are already stored in the registry.

If you create a DLL whose classes or packages are not stored in the registry, the packages or classes stored in the DLL will not be found by the Symantec registry and you receive an error message. SNJREG allows you to enter the package or class name and which **dll** or **exe** files contain the package or class.

SNJREG has the following options:

| Option        | Description                                                                                                                       |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------|
| -class        | DLLs register individual classes, not packages. Using -class will erase any previous DLLs assigned to a class already registered. |
| -noprompt     | Disables the prompt before making changes to existing entries                                                                     |
| -nowarn       | Turns off all warnings                                                                                                            |
| -verbose      | Reports all registrations made                                                                                                    |
| -reg:file.reg | Creates a registry file                                                                                                           |

To register a package in a **dll** or **exe** file by using SNJREG:

1. Open a DOS Window.
2. Change to the directory where the DLL files are located.
3. Enter:

```
SNJREG [ options ] { file.dll }
```

*options* can be any of the parameters in the previous table. *file.dll* is the name of a DLL containing the classes or packages you want to register. You can specify as many DLLs as you want, delimited by a space.



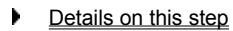
## Assembling native GUI applications

```
{button  
Concepts,AL('Projects_overview;Creating_native_overview;Native_libraries_and_DLLs_overview;Linking_native_overview;Using_OPTLINK_and_SMAKE_overview',0,'')} {button See  
Also,AL('SNJREG_howto;Applications_native_console_step_overview;DLLs_native_step_overview;Form_Designer_F1;Project_Options_dialog_F1;Deploying_Native_Applications_howto;Deploying_DLLs_howto',0,'')}
```

Visual Cafe Professional edition provides powerful tools for assembling a native, Win32 application quickly. In general, the development cycle is made of these basic steps:

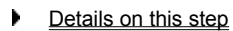
1. Create a new project.

To get started quickly, you can use the Basic Win32 GUI Application project template.



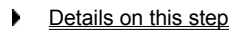
[Details on this step](#)

2. Design the user interface.



[Details on this step](#)

3. Enhance Java source code.



[Details on this step](#)

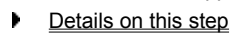
4. Set project options.

If you started with the Basic Win32 GUI Application project template, you probably do not need to set project options.



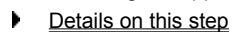
[Details on this step](#)

5. Test run the application in Visual Cafe.



[Details on this step](#)

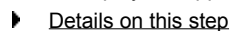
6. Debug the application, if needed.



[Details on this step](#)

7. Test run the application outside of Visual Cafe.

8. Deploy the application.



[Details on this step](#)

**Note** Look in the samples directory for examples of creating and using native applications.



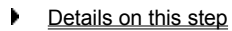
## Assembling native console applications

```
{button  
Concepts,AL('Projects_overview;Creating_native_overview;Native_libraries_and_DLLs_overview;Linking_native_overview;Usin  
g_OPTLINK_and_SMAKE_overview',0,'')} {button See  
Also,AL('SNJREG_howto;Applications_native_step_overview;DLLs_native_step_overview;Form_Designer_F1;Project_Options_  
dialog_F1;Deploying_Native_Applications_howto;Deploying_DLLs_howto',0,'')}
```

Visual Cafe Professional edition provides powerful tools for assembling a native, Win32 application quickly. In general, the development cycle is made of these basic steps:

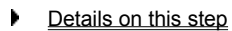
1. Create a new project.

To get started quickly, you can use the Basic Win32 Console Application project template.



[Details on this step](#)

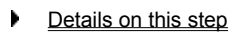
3. Enhance Java source code.



[Details on this step](#)

4. Set project options.

If you started with the Basic Win32 Console Application project template, you probably do not need to set project options.



[Details on this step](#)

5. Test run the application in Visual Cafe.



[Details on this step](#)

6. Debug the application, if needed.



[Details on this step](#)

7. Test run the application outside of Visual Cafe.

8. Deploy the application.



[Details on this step](#)

**Note** Look in the samples directory for examples of creating and using native applications.



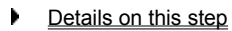
## Assembling native DLLs

```
{button  
Concepts,AL('Projects_overview;Creating_native_overview;Native_libraries_and_DLLs_overview;Linking_native_overview;Usin  
g_OPTLINK_and_SMAKE_overview',0,'')} {button See  
Also,AL('SNJREG_howto;Applications_native_step_overview;Applications_native_console_step_overview;Form_Designer_F1;P  
roject_Options_dialog_F1;Deploying_Native_Applications_howto;Deploying_DLLs_howto',0,'')}
```

Visual Cafe Professional edition provides powerful tools for assembling a native, Win32 DLL quickly. In general, the development cycle is made of these basic steps:

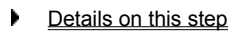
1. Create a new project.

You can start with the Basic DLL project template.



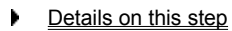
[Details on this step](#)

2. Design the user interface.



[Details on this step](#)

3. Enhance Java source code.



[Details on this step](#)

4. Set project options.

If you started with the Basic DLL project template, you probably do not need to set project options.



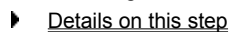
[Details on this step](#)

5. Test run the DLL in Visual Cafe.



[Details on this step](#)

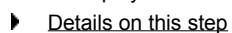
6. Debug the DLL, if needed.



[Details on this step](#)

7. Test run the DLL outside of Visual Cafe.

8. Deploy the DLL.



[Details on this step](#)

**Note** Look in the samples directory for examples of creating and using DLLs.

## Deploying native applications

```
{button  
Concepts,AL('Projects_overview;Creating_native_overview;Native_libraries_and_DLLs_overview;Linking_native_overview;Using_OPTLINK_and_SMAKE_overview',0,'')} {button See  
Also,AL('SNJREG_howto;Applications_native_step_overview;Applications_native_console_step_overview;DLLs_native_step_overview;Form_Designer_F1;Project_Options_dialog_F1;Deploying_DLLs_howto',0,'')}
```

To deploy your native Win32 application, you need the DLLs the program requires.

Visual Cafe comes with the standard DLLs you need to run your Java programs. The redistributable Visual Cafe DLLs are in the `redist` directory. You only need `snjrmiregistry.exe` if you have a remote method invocation (RMI) executable that is like one of the samples, which does not start the naming server itself. (The other RMI sample does not require `snjrmiregistry.exe`.) See [Native libraries and DLLs included with Visual Cafe](#) for a list of DLLs included with Visual Cafe.

You also need any DLLs you wrote yourself.

You need to register the DLLs on the computer where the executable will run. To do so, you can use the SNJREG tool. See [Registering DLLs with SNJREG](#) for more information.



## Deploying DLLs and libraries

```
{button  
Concepts,AL('Projects_overview;Creating_native_overview;Native_libraries_and_DLLs_overview;Linking_native_overview;Using_OPTLINK_and_SMAKE_overview',0,','')} {button See  
Also,AL('SNJREG_howto;Applications_native_step_overview;Applications_native_console_step_overview;DLLs_native_step_overview;Form_Designer_F1;Project_Options_dialog_F1;Deploying_Native_Applications_howto',0,','')}
```

To deploy your DLL, you need the required DLLs.

Visual Cafe comes with the standard DLLs you need to run your Java programs. The redistributable Visual Cafe DLLs are in the `redist` directory. You only need `snjrmregistry.exe` if you have a remote method invocation (RMI) executable that is like one of the samples, which does not start the naming server itself. (The other RMI sample does not require `snjrmregistry.exe`.) See [Native libraries and DLLs included with Visual Cafe](#) for a list of DLLs included with Visual Cafe.

You also need any other DLLs that your DLL requires.

You need to register the DLL on the computer where the DLL is used. To do so, you can use the SNJREG tool. See [Registering DLLs with SNJREG](#) for more information.

To create a program that uses your custom DLL, you need to provide the class files, the library file (which is created when the DLL is created), and the DLL. The class files must be on the class path and the library should be specified in the compiler options for the project. To run a program that uses a DLL, all you need is the DLL, and you need to register it.

## Using OPTLINK and SMAKE with Java programs

```
{button How  
To,AL('Running_a_Project_howto;OU_COMM_LINE_INTERACTIVE_OPERA_JT;SK_SMAKE_COMM_LINE_SYNTAX_COMM_  
OPS_JT;SNJREG_howto;Applications_native_step_overview;Applications_native_console_step_overview;DLLs_native_step_ov  
erview;Form_Designer_F1;Project_Options_dialog_F1;Deploying_Native_Applications_howto;Deploying_DLLs_howto',0,'; visu  
al')} {button See  
Also,AL('OI_OPTLINK_OVERVIEW_JT;SK_SMAKE_OVERVIEW_JT;Projects_overview;Creating_native_overview;Native_librari  
es_and_DLLs_overview;Linking_native_overview;Using_OPTLINK_and_SMAKE_overview',0,';concept')}
```

Most Java programmers do not need to directly use OPTLINK and SMAKE to create native Java programs with Visual Cafe Professional edition.

OPTLINK is a tool for linking object files into executables. The Java compiler provided with Visual Cafe compiles and links native applications for you automatically. You need to use OPTLINK directly only if you need more flexibility while linking your programs.

SMAKE is a make tool for command-line users. It is recommended that you instead use Visual Cafe projects, which are a lot easier to use. Only very complicated programs, such as those that include multiple languages, might require the use of makefiles.

Keep in mind that while OPTLINK and SMAKE run under both MS-DOS and Windows95/NT, and that OPTLINK can link both 16-bit and 32-bit executables, native Java applications are 32-bit Windows applications that will run only on Windows 95 or Windows NT.

## ▶ Displaying the contents of binary files: OPTDUMP

```
{button  
Concepts,AL('Using_OPTLINK_and_SMAKE_overview;OI_OPTLINK_OVERVIEW_JT;SK_SMAKE_OVERVIEW_JT;Projects_ov  
erview;Creating_native_overview;Native_libraries_and_DLLs_overview;Linking_native_overview',0,',';concept')}} {button See  
Also,AL('Running_a_Project_howto;OU_COMM_LINE_INTERACTIVE_OPERA_JT;SK_SMAKE_COMM_LINE_SYNTAX_COM  
M_OPS_JT;SNJREG_howto;Applications_native_step_overview;Applications_native_console_step_overview;DLLs_native_step  
_overview;Form_Designer_F1;Project_Options_dialog_F1;Deploying_Native_Applications_howto;Deploying_DLLs_howto',0,',';v  
isual')}}}
```

OPTDUMP displays the contents of **obj** (both omf and coff), **lib**, **exe**, and **dll** files. Any debug information in these files is also displayed. Any files of unknown type are binary dumped.

Following is the format:

**OPTDUMP** [ *options* ] *infile* [ *outfile* ]

/B[SeekOffset[,length]] Force binary dump

/C Disable CodeView display

/N No logo

/P Enable PharLap # RVA's

/H Disable **exe** header display

/V Verbose PE object display

## ▶ Displaying the component version: Cafever

```
{button  
Concepts,AL('Using_OPTLINK_and_SMAKE_overview;OI_OPTLINK_OVERVIEW_JT;SK_SMAKE_OVERVIEW_JT;Projects_ov  
erview;Creating_native_overview;Native_libraries_and_DLLs_overview;Linking_native_overview',0,',','concept')}} {button See  
Also,AL('Running_a_Project_howto;OU_COMM_LINE_INTERACTIVE_OPERA_JT;SK_SMAKE_COMM_LINE_SYNTAX_COM  
M_OPS_JT;SNJREG_howto;Applications_native_step_overview;Applications_native_console_step_overview;DLLs_native_step  
_overview;Form_Designer_F1;Project_Options_dialog_F1;Deploying_Native_Applications_howto;Deploying_DLLs_howto',0,',','v  
isual')}}}
```

CafeVer is a command line utility that prints version information for certain components in Visual Cafe. It reads a text file Cafever.dat to determine which components to report version information for. It is intended to be invoked from the Visual Cafe Bin directory.

Following is the format:

```
C:\vcafe\bin> cafever [ component_name ]
```

## ▶ Converting coff object files to omf: coff2omf

```
{button  
Concepts,AL('Using_OPTLINK_and_SMAKE_overview;OI_OPTLINK_OVERVIEW_JT;SK_SMAKE_OVERVIEW_JT;Projects_ov  
erview;Creating_native_overview;Native_libraries_and_DLLs_overview;Linking_native_overview',0,',';concept')}} {button See  
Also,AL('Running_a_Project_howto;OU_COMM_LINE_INTERACTIVE_OPERA_JT;SK_SMAKE_COMM_LINE_SYNTAX_COM  
M_OPS_JT;SNJREG_howto;Applications_native_step_overview;Applications_native_console_step_overview;DLLs_native_step  
_overview;Form_Designer_F1;Project_Options_dialog_F1;Deploying_Native_Applications_howto;Deploying_DLLs_howto',0,',';v  
isual')}}}
```

coff2omf converts coff object (**obj**) files to omf format. Visual Cafe uses omf for the format of object files. Some other vendors  
coff format **obj** files.

Following is the format:

**coff2omf** *filenames.obj*

It converts the file(s) in place. The **obj** extension is optional.

## Interactions

## Understanding component interactions

```
{button How
To,AL('Form_Designer_F1;Class_Browser_using_F1;Source_Window_F1;Using_the_Interaction_Wizard_F1;Connecting_Form_
components_howto;Deleting_a_connection_howto;connecting_classes_howto;binding_code_to_a_menu_command_howto;bindi
ng_code_to_a_form_component_howto;adding_an_event_to_component_howto;Changing_a_connection_howto',0,'')}
{button See
Also,AL('Understanding_Visual_Components;Using_Visual_Caf_as_Your_Development_Environment;Projects_overview;Visual
_Caf_Tools_for_Working_with_Classes_and_Components',0,'')}
```

One of the most powerful features of Visual Cafe is the ability to quickly build a relationship between two [components](#). In Visual Cafe, this is called an [interaction](#). Interactions are implemented as methods and imply an event notification.

Anytime a button is pushed, or a box is checked, a program action called an [event](#) is generated. To link those events to a corresponding action in your program, you need an [event handler](#) that responds to that event.

Visual Cafe lets you specify these high-level interactions between components and events. As you create interactions by visually connecting components, Visual Cafe automatically generates code for the relationship. So, you can assemble interactive applets and applications without writing code.

The key elements of an interaction are the trigger event and the action component. The trigger event is the originator of the interaction and is associated with a component. The trigger event determines when the interaction happens. The action component is the component on which a defined "action" happens. The action specifies what to do when a condition is met.

For example, you can connect a button (the trigger component) to a text box (the action component) so that when the user clicks the button (the trigger event), the associated text box is enabled for data input (the action).

An interaction does not have to contain two components. You can create an interaction where the trigger and action component are the same. For example, you can create an interaction on an animation component where a mouse click anywhere within the boundaries of a component starts an animation in that component; another click ends the animation.

In the JDK 1.1 event model, when an interaction is created, code for the event handler, listener registration, and [adapter/listener](#) class with a call is automatically generated. If you want to delete an interaction, you need to delete this code.

Visual Cafe changes the source code in five ways when you create an interaction:

- First, Visual Cafe generates an adapter or listener implementation for the event. If one was already generated, it is used with the new interaction.
- Second, in the adapter/listener class, Visual Cafe generates a check for the object requesting the handling of the event and a call to the event handler.
- Third, Visual Cafe instantiates this adapter/listener class and generates the registration (specifically, `object.addTypeListener`) after the REGISTER\_LISTENERS tag. If the adapter/listener class has already been instantiated, it is used.
- Fourth, an event handler is generated. If the event handler already exists, it is used.
- Fifth, the interaction specified in the wizard is generated in the event handler.

For example, if you have a button, called NextButton, that displays the next image of a slide show, called VacationSlides, the event handler could look like this and appear toward the end of the Java source file:

```
void NextButton_Action(java.awt.event.ActionEvent event)
{
    // to do:  code goes here.

    //{{CONNECTION
    // Go to the SlideShow's next image
    VacationSlides.nextImage();
    //}}
```

More toward the middle of the Java source file would be the listener registration:

```
//{{REGISTER_LISTENERS
SymAction lSymAction = new SymAction();
NextButton.addActionListener(lSymAction);
//}}
```

Toward the end of the Java source file would be the adapter/listener class with a call to the event handler:

```
class SymAction implements java.awt.event.ActionListener
{
```

```

public void actionPerformed(java.awt.event.ActionEvent event)
{
    Object object = event.getSource();
    if (object == NextButton)
        NextButton_Action(event);
}
}

```

If you then add an interaction between VacationSlides and a Label component, Visual Cafe would generate a new event handler for VacationSlides, and the listener registration code would change:

```

//{{REGISTER_LISTENERS
SymAction lSymAction = new SymAction();
NextButton.addActionListener(lSymAction);
VacationSlides.addActionListener(lSymAction);
//}}

```

And the adapter/listener class code would change:

```

class SymAction implements java.awt.event.ActionListener
{
    public void actionPerformed(java.awt.event.ActionEvent event)
    {
        Object object = event.getSource();
        if (object == NextButton)
            NextButton_Action(event);
        else if (object == VacationSlides)
            VacationSlides_SlideChanged(event);
    }
}

```

## Using the Interaction Wizard

{button Concepts,AL('Understanding\_Component\_Connections\_overview',0,'')} {button See Also,AL('Deleting\_a\_connection\_howto;Changing\_a\_connection\_howto;Connecting\_Form\_components\_howto;connecting\_classes\_howto;binding\_code\_to\_a\_menu\_command\_howto;binding\_code\_to\_a\_form\_component\_howto;adding\_an\_event\_to\_component\_howto',0,'')}

One of the most powerful features of Visual Cafe is the ability to create **interactions** between **components**. The Interaction Wizard lets you graphically build relationships between components, or between a component and itself (for example, double-clicking an item in a list box could remove the item from the list box and add it to another list box). These relationships specify the actions to take when an **event** is triggered on a component. For example, in a slide show, a button click could cause the next image to be displayed. Visual Cafe automatically generates the necessary code for the specified relationship.

You can perform these tasks related to interactions:

[Creating a component interaction](#)

[Changing an existing interaction](#)

[Deleting an interaction](#)



## Creating a component interaction


```
{button Concepts,AL(^Understanding_Component_Connections_overview;Projects_overview',0,',')} {button See  
Also,AL(^Changing_a_connection_howto;Deleting_a_connection_howto;Using_the_Interaction_Wizard_F1;Palette_F1;Form_De  
signer_F1;connecting_classes_howto;binding_code_to_a_menu_command_howto;binding_code_to_a_form_component_howto;  
adding_an_event_to_component_howto',0,',')}
```

With the Interaction Wizard, you can create an [interaction](#):

- by connecting two [components](#) on a [form](#) in the Form Designer
- by connecting two components in the Project window
- by connecting two components across the Project window and Form Designer (such as a button in the Form Designer and a dialog component in the Project window)
- by connecting a component to itself
- by connecting a form and a component contained by the form

The components must be within the same project.

### To visually connect components

1. In the Form Designer or Project window, click the Interaction tool icon , then drag a line from the trigger component to the action component within the same project. To connect a component to itself, click the component.

The action component is highlighted to help you identify which component you selected. If a component will not highlight, the interaction could be inappropriate.

After you release the mouse button, the Interaction Wizard appears.

**Tip** Before you release the mouse button, you can press ESCAPE to cancel the interaction, or move the interaction line to another component.

2. In the Interaction Wizard, verify that the component names are correct.

The trigger component should appear in the Start an interaction field title; if it is wrong, you need to start over.

The action component should appear in the Select the item you want to interact with field; if it is wrong, choose another component.

3. In the Start an interaction field, select the [event](#) that activates the interaction.
4. In the Choose what you want to happen field, select an action to invoke when the interaction event occurs.
  - If the action takes no parameters, the interaction is finished.
  - If the action takes parameters, the Next button is enabled. When you click Next, a second window displays allowing you to fill in those parameters.
5. If you see a Next button, click it. In the second window, specify the interaction condition.

**Tip** A variable must be of the type listed for the bottom radio button, A *type* constant or expression, for it to appear. If you define a variable of this type and the variable is in scope, it will appear in the variable list.


6. Click Finish.

In the Java source file, code is generated for the call handler, listener registration, and adapter/listener class.

In the source code, Visual Cafe performs five edits:

- First, Visual Cafe generates an adapter or listener implementation for the event. If one was already generated, it is used with the new interaction.
- Second, in the adapter/listener class, Visual Cafe generates a check for the object requesting the handling of the event and a call to the event handler.
- Third, Visual Cafe instantiates this adapter/listener class and generates the registration (specifically, *object.addtypeListener*) after the REGISTER\_LISTENERS tag. If the adapter/listener class has already been instantiated, it is used.
- Fourth, an event handler is generated. If the event handler already exists, it is used.
- Fifth, the interaction specified in the wizard is generated in the event handler.

### To connect components within the Interaction Wizard

1. Select a component in the Form Designer or Project window.
2. Choose Object  Add Interaction.
3. Complete the Interaction Wizard as described in the previous procedure.



## Changing an existing interaction

```
{button
Concepts,AL('Understanding_Component_Connections_overview;Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,',';')} {button See
Also,AL('Connecting_Form_components_howto;Deleting_a_connection_howto;Using_the_Interaction_Wizard_F1;Class_Browser_using_F1;Source_Window_F1;connecting_classes_howto;binding_code_to_a_menu_command_howto;binding_code_to_a_form_component_howto;adding_an_event_to_component_howto',0,',';')}
```

[Interactions](#) are implemented as methods in the [container](#) class of a [component](#). The interaction methods are called [event handlers](#).

1. Make the project active by clicking the Project window.
2. Choose View (or Window) ► Class Browser  
You should see a listing of project classes in the Classes pane.  
**Note** If the class you want is not displayed in the pane, you might need to change what classes are displayed by choosing Classes ► Options.
3. In the Classes list, click the container class that contains the trigger component.  
In the Members pane, you should see a list of methods and variables associated with the container class.
4. Identify the appropriate event handler. Event handlers are named using a combination of the component name and the trigger event; for example, `NextButton_Action`.  
**Note** If you rename a component after an event handler is created, the method is not renamed.
5. Display the method's source code by clicking the event handler. The interaction code is marked by the `//{{CONNECTION` comment and a comment that explains the interaction.

For example:

```
void NextButton_Action(java.awt.event.ActionEvent event)
{
    // to do: code goes here.

    //{{CONNECTION
    // Go to the SlideShow's next image
    VacationSlides.nextImage();
    //}}
```

6. In the editing pane, make any source code changes you need.

► [Details on this step](#)

## Deleting an interaction

```
{button
Concepts,AL('Understanding_Component_Connections_overview;Visual_Caf_Tools_for_Working_with_Classes_and_Compone
nts',0,',';')} {button See
Also,AL('Connecting_Form_components_howto;Changing_a_connection_howto;Using_the_Interaction_Wizard_F1;Class_Brow
ser_using_F1;Source_Window_F1;connecting_classes_howto;binding_code_to_a_menu_command_howto;binding_code_to_a_
form_component_howto;adding_an_event_to_component_howto',0,',';')}
```

When deleting an [interaction](#) or [event binding](#), the following code is involved:

- the [event handler](#)
- the listener registration
- the event handler call in the [adapter/listener](#) class

For example, if you have a button, called NextButton, that displays the next image of a slide show, called VacationSlides, the event handler could look like this and appear toward the end of the Java source file:

```
void NextButton_Action(java.awt.event.ActionEvent event)
{
    // to do:  code goes here.

    //{{CONNECTION
    // Go to the SlideShow's next image
    VacationSlides.nextImage();
    //}}
}
```

The event handler contains the interaction, which is marked by the CONNECTION tag.

More toward the middle of the Java source file would be the listener registration:

```
//{{REGISTER_LISTENERS
SymAction lSymAction = new SymAction();
NextButton.addActionListener(lSymAction);
//}}
```

Toward the end of the Java source file would be the adapter/listener class with a call to the event handler:

```
class SymAction implements java.awt.event.ActionListener
{
    public void actionPerformed(java.awt.event.ActionEvent event)
    {
        Object object = event.getSource();
        if (object == NextButton)
            NextButton_Action(event);
    }
}
```

If you then add an interaction between VacationSlides and a Label component, Visual Cafe would generate a new event handler for VacationSlides, and the listener registration code would change:

```
//{{REGISTER_LISTENERS
SymAction lSymAction = new SymAction();
NextButton.addActionListener(lSymAction);
VacationSlides.addActionListener(lSymAction);
//}}
```

And the adapter/listener class code would change:

```
class SymAction implements java.awt.event.ActionListener
{
    public void actionPerformed(java.awt.event.ActionEvent event)
    {
        Object object = event.getSource();
        if (object == NextButton)
            NextButton_Action(event);
        else if (object == VacationSlides)
            VacationSlides_SlideChanged(event);
    }
}
```

}

#### To delete the event handler by using the Source window

1. In the Source window, open the source file containing the event handler.
- ▶ Details on this step
2. In the Objects drop-down list of the Source window, choose an object.
3. In the Event/Methods drop-down list, choose the event.  
Existing events and methods are shown in bold.
4. Manually remove the interaction in the event handler code, or remove the entire event handler if it only handles one interaction.

#### To delete the event handler by using the Class Browser

1. Make the project active by moving focus to the project's Project window.
2. Choose View (or Window) ▶ Class Browser.  
A listing of project classes displays in the Classes pane.
3. In the Classes pane, click the container class that contains the trigger component.  
In the Members pane is a list of methods associated with the container class.  
**Note** If the class you want is not displayed in the pane, you might need to change what classes are displayed by choosing Classes ▶ Options.
4. Select the appropriate event handler for the interaction. An event handler is named using a combination of the component's name and the trigger event; for example, `NextButton_Action`.  
**Note** If you rename a component after an event handler is created, the method is not renamed.
5. Remove the interaction in the event handler code. Or remove the entire event handler if it only handles one interaction.  
To delete the event handler, right-click the event handler and choose Delete Member.

#### To manually delete the applicable portions of the listener registration and the call in the adapter/listener class

1. Open the Source window.
- ▶ Details on this step
2. Delete the applicable portions of code.  
Consult a Java book for more information. In general, these are the edits you need to make:
  - In the adapter/listener class, if there is only one call to an event handler, delete the adapter/listener class. If there is more than one call to an event handler, delete the check for the object requesting the handling of the event and the call to the event handler. This is an **if** or **else if** statement; make sure the code you are left with is syntactically correct.
  - In the listener registration (marked by the `REGISTER_LISTENERS` comment), delete the `object.addtypeListener` call for that component, if the listener registration is not used by another event tied to that component.

**Obsolete**

## Working with interactions

```
{button How  
To,AL('connecting_form_components_howto;connecting_classes_howto;binding_code_to_a_menu_command_howto;binding_c  
ode_to_a_form_component_howto;adding_an_event_to_component_howto',0,','')} {button See  
Also,AL('Form_Designer_F1;Differences_between_Applets_and_Applications;Understanding_Visual_Components;Understandin  
g_Workspaces;Using_Visual_Caf_as_Your_Development_Environment',0,','')}
```

Anytime a button is pushed, or a box is checked, a program action called an [event](#) is generated. To link those events to a corresponding action in your program, you need an [event handler](#) that responds to that event.

One of the most powerful features in Visual Cafe is the ability to specify these high-level interactions between [components](#) and events. The key elements of any interaction are the trigger event and the action. The trigger event is the originator of the action; the interaction determines when to execute the code. You can add conditions to an interaction just like you would add an `IF` statement in code. The action element is the meat of the interaction; it specifies what to do when the condition is satisfied.

The Interaction Wizard allows you to graphically build relationships between components: Visual Cafe automatically generates code for the specified relationship.



With Visual Cafe, you use the Interaction Wizard to create the interaction between the visual component and a corresponding event. The Interaction Wizard automatically updates your source code for you.



## Creating an interaction between a form and component

```
{button  
Concepts,AL(^Understanding_Component_Connections_overview;Palette_F1;Form_Designer_F1;Projects_overview',0,',')}  
{button See  
Also,AL(^Connecting_Form_components_howto;Changing_a_connection_howto;Deleting_a_connection_howto;Using_the_Interaction_Wizard_F1',0,',')}
```

An [interaction](#) is created by connecting two [components](#). The most common interaction is one between two components on a [form](#). You may also want to create an interaction between a component and a form.

1. In the Project window, double-click the target form to open it.
  2. Click the Interaction tool icon  on the Palette.
  3. In the Project window, double-click the component that you want to initiate the action.
  4. Define the interaction in the Interaction Wizard. This step is the same as defining an interaction between two components.
-  [Details on this step](#)



**Running, compiling, executing**



## Running a project

```
{button  
Concepts,AL('Understanding_the_Visual_Caf_Debugger;The_Debugging_Workspace_and_Tools;Debugging_Applets_and_App  
lications',0,'')} {button See Also,AL('Debugging Your  
Program;Controlling_Compiler_Information_F1;Setting_the_release_type;Project_Options_dialog_F1',0,'')}
```

You can compile and run a project any time during its development cycle. Visual Cafe automatically saves files in the project before running.

- Choose Project ► Execute to run the project without the debugger.
- Choose Project ► Run in Debugger to run the project and start the debugger.

**Important** Before running in the debugger, make sure your project options are set to debug. When you are ready to compile your final program, make sure the project options are set to final. See [Specifying whether builds are debug or final](#) for more information.

## The main class in bytecode and native applications

{button How To,AL('Project\_Options\_dialog\_F1;Running\_a\_Project\_howto',0,'')} {button See Also,AL('Projects\_overview;The\_Differences\_between\_Applets\_and\_Applications',0,'')}

The *main class* is the name of the class with a **main** method. For both a bytecode Java application and a native Win32 Java application, the main class is the starting point of execution. However, you should note these differences between bytecode and native applications:

- When you run a bytecode application from the command line, you type the name of the Java file that contains the **main** method as the first argument to java.exe. For a native Win32 application, you run the application outside the Visual Cafe environment as you would any other executable and use the application name, not the main class name. See [Specifying the main class to run for an application](#) and [Specifying the name of a native application or DLL](#) for more information.
- An application must have a main class containing a **main** method with this signature:

```
static public void main(String args[])
```

For a bytecode application, if it does not have a method of this format, the application can compile but will not run. For a native application, the application cannot compile or run.

## Compiling from the command line

{button Concepts,AL('Projects\_overview',0,','concept')} {button See Also,AL('Project\_Options\_dialog\_F1;F1\_Messages\_Window;Running\_a\_Project\_howto',0,','visual')}

You can compile using the SJ command line:

```
sj { { file.java } { @file } { switches } }
```

The braces ( { } ) mean "repeated zero or more times." The only required parameter is a Java source file. For native Win32 applications or DLLs (available with the Professional edition only), you also need to specify either the **obj** or **link** switch.

SJ takes arguments in any order; if any arguments conflict, the rightmost argument takes precedence. SJ with no arguments prints a short help file to stdout.

*@file* means that *file* is searched for as an environment variable name, and if not found, as a file name. If it is found, the text of the environment variable or file name is inserted in the command line as if it were part of the command line. In this way, you can give command line arguments from a file, for example, if you need to circumvent the command line length limit of an operating system. If *file* is not found, no text is inserted.

### Switches

SJ takes the following switches.

| Switch                  | Description                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -cdb <i>file.cdb</i>    | Generate compilation database <i>file.cdb</i> . This database stores dependency information and is needed by the make switch.                                                                                                                                                                                                                                                         |
| -make[:r]:w]            | Build out-of-date files only by checking dependencies between all files that were passed on the command line. You must supply a <b>cdb</b> file with the cdb switch.                                                                                                                                                                                                                  |
| -make:r                 | Check dependencies on all imported files and rebuild them as needed.                                                                                                                                                                                                                                                                                                                  |
| -make:w                 | Check dependencies on all imported files and warn if they are out-of-date.                                                                                                                                                                                                                                                                                                            |
| -classpath <i>path</i>  | Use <i>path</i> instead of the setting of the environment variable CLASSPATH.                                                                                                                                                                                                                                                                                                         |
| -d <i>outputdir</i>     | Set the output directory. The default is to put <b>class</b> files with their respective <b>java</b> files.                                                                                                                                                                                                                                                                           |
| -debug                  | When the compiler is Sun's compiler, javac, using this option causes the compiler to report diagnostic messages about its own execution. When the compiler is SJ, the switch is ignored.                                                                                                                                                                                              |
| -depend <i>file.dep</i> | Generate dependencies into <i>file.dep</i> . You can read it to see what classes your files need to deploy.                                                                                                                                                                                                                                                                           |
| -g                      | Add debug information to output files so they can be debugged.                                                                                                                                                                                                                                                                                                                        |
| -help                   | Print help on compiler switches.                                                                                                                                                                                                                                                                                                                                                      |
| -j <i>codepage</i>      | Override the system codepage default. Asian language character sets include double-byte characters, where certain prefix bytes mean that the following byte forms part of the character. Asian language characters can appear in "" strings, in " character literals, and in comments. The codepage guides the compiler in converting from the ASCII character set used in the source |

**java** files into Unicode.

The compiler normally uses the system default codepage as a guide for translating double-byte character sets. But this can be overridden with the `j` switch. Some common values are:

```
no -j    Use system default locale and
codepage
-j .932  Japanese
-j .936  Chinese
-j .949  Korean
-j C     Use "C" locale
```

|           |                                                                                                                                                                                                                                                                                                                                                                          |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -noinline | The <code>O</code> switch (optimize) will normally enable function inlining. To have optimization without function inlining, use the <code>noinline</code> switch. Inlining means that Visual Cafe takes a function's code and imbeds it in the calling function instead of calling the function. Inlining increases execution speed but also increases executable size. |
| -nowarn   | Turn off warnings.                                                                                                                                                                                                                                                                                                                                                       |
| -nowrite  | Compile to look for errors, but do not write out any files.                                                                                                                                                                                                                                                                                                              |
| -O        | Optimize.                                                                                                                                                                                                                                                                                                                                                                |
| -verbose  | Display progress reports as compilation progresses.                                                                                                                                                                                                                                                                                                                      |
| -xdepend  | Generate dependency information to stdout that is compatible with <code>javac</code> .                                                                                                                                                                                                                                                                                   |

#### Native Win32 switches

Here are the command line options that apply only to native applications and DLLs (available in Professional edition only). Either the `obj` or `link` switch is required; the rest are optional.

| Option                       | Description                                                                                                                                                                                                                                 |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -obj                         | Generate native x86 object files.                                                                                                                                                                                                           |
| -link <i>outputname</i>      | Link generated object files into <i>outputname</i> . [exe dll]. This command supplies the same functionality as the <code>obj</code> switch, plus runs the linker.                                                                          |
| -main <i>mainclass</i>       | Specify the main class for the native executable. <i>mainclass</i> is a fully qualified class name. (If no main switch is specified, it will default to <i>outputname</i> .)                                                                |
| -W                           | Generate Windows-only executable (no console).                                                                                                                                                                                              |
| -g                           | Add debug information to output files so that the result can be debugged. Debug information is in CV4 format, so you can use it with debuggers other than the Visual Cafe debugger.                                                         |
| -export <i>package class</i> | Specify classes or packages to be exported from the DLL, so they are accessible from other executables. <i>package class</i> can be either a fully qualified class name or a package specification (for example, <code>java.awt.*</code> ). |
| -g6 <i>file.tdb</i>          | Add debug information to output files so that                                                                                                                                                                                               |

the result can be debugged. Use *file.tdb* as the debug "type database" file. This is the format required to debug in the Symantec Visual Cafe environment.

|                   |                                                                                    |
|-------------------|------------------------------------------------------------------------------------|
| -5 -6             | Generate Pentium (p5) or Pentium Pro (p6) code.                                    |
| -profile          | Do performance profiling.                                                          |
| -L/ <i>switch</i> | Pass <i>/switch</i> to the linker. To see the valid options, type <b>link /?</b> . |
| <i>file.lib</i>   | Link in the library file. Used with the link switch.                               |
| <i>file.res</i>   | Link in the resource file. Used with the link switch.                              |
| <i>file.def</i>   | Link in the module definition file. Used with the link switch.                     |

### Environment variables

SJ uses the following environment variables, either set at the console command line prompt or in the file SC.INI:

| Variable  | Description                                                                                                                                                                                                   |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CLASSPATH | A semicolon-separated list of paths (similar to the PATH environment variable) where SJ looks for classes. The default CLASSPATH is the current directory. This can be overridden using the classpath switch. |
| PATH      | Search path for executable files if they are not found in the same directory where SJ resides.                                                                                                                |

### How SJ searches for programs

SJ first searches in the directory where SJ.EXE was found. If the programs are not found there, then the PATH is searched.

### How SJ searches for imports in SC.INI

SJ looks for the imports your program requires through the CLASSPATH or PATH settings. It is important that SJ find the correct imports if you want your build to be correct.

SJ looks in the directory where sj.exe resides for file SC.INI. SC.INI is a text file, containing environment variable settings in a similar manner as they might be set in AUTOEXEC.BAT:

```
;Comments are lines where the first non-blank character
; is a ';'
[Environment]
CLASSPATH=C:\CAFE\BIN

;Note that %PATH% gets replaced by the previous value of
; the environment variable PATH.
PATH=C:\CAFE\BIN;%PATH%
```

The special environment variable @P gets replaced with the path to where the SC.INI file resides. For example, the previous lines can be replaced with the following if SC.INI is in C:\SC\BIN:

```
[Environment]
CLASSPATH=%@P%\LIB
PATH=%@P%\BIN;%PATH%
```

This makes the settings in SC.INI independent of where the SJ directory tree is installed.

If SC.INI is not there, no error results. This feature is useful for avoiding cluttering up AUTOEXEC.BAT with environment variable settings. It also makes running SJ independent of any existing environment variables set for other tools.

The environment settings in SC.INI do not prefix, augment, or append any existing settings in the environment. They replace the environment settings for the duration of running the IDDE or the compiler. For example, to use SC.INI to append a CLASSPATH

path to the existing CLASSPATH path, you can use:

```
[Environment]
```

```
CLASSPATH=%CLASSPATH%;C:\CAFE\LIB
```

## Deployment



## Deploying applets

```
{button Concepts.AL('Using_JAR_files_overview;Object_Library_F1;Projects_overview',0,'')} {button See  
Also.AL('Deploying_Applications_how_to;Determining_What_Class_Files_an_Applet_or_Application_Needs_how_to;Configurin  
g_UNIX-based_Web_Servers_how_to',0,'')}
```

After you complete an applet in Visual Cafe, you are ready to deploy it on a Web site. You need to know how your particular Web site is set up to get your applet up and running. However, here are some guidelines. Because your project can contain more than one applet that appears in related Web pages, these guidelines are for setting up a project that contains one or more applets.

**IMPORTANT** The classes needed by Visual Cafe components are stored in `symbeans.jar`. You do not want to deploy using `symbeans.jar`, because it will affect the performance of your applets. Instead, you want to deploy using just the classes needed by the components in your applets. These classes can be packaged in a [JAR file](#) or not.

### To deploy your applets in a JAR

1. Use the Project ► JAR command to create a [JAR file](#) containing your applets and all supporting files, including Symantec class files.

#### ► [Details on this step](#)

**Tip** Your applets should use relative URLs for graphics files so you can easily move your applets to different computers.

2. Add the variable `ARCHIVE="name.jar"` to the applet tags in your HTML files. You can specify multiple JAR files by delimiting them with a comma (,).

**Note** Not all browsers support multiple JARs.

**Tip** Remember that the applet tags specify where your applets are relative to the location of the HTML files. So you must place the JAR file in the same relative location.

3. On your local computer, test your Web pages by opening them in a Web browser from outside of the Visual Cafe environment.
4. Put your JAR file and HTML files in a directory on the Web server, as they appeared in your Visual Cafe project directory.
5. After completing the setup of your Web site, test your Web pages from remote computers.

You can also test it with different operating systems and Web browsers.

### To deploy your applets outside of a JAR

Here is one way:

1. Use the Project ► JAR command to create a [JAR file](#) containing your applets and all supporting files, including Symantec class files.

#### ► [Details on this step](#)

**Tip** Your applets should use relative URLs for graphics files so you can easily move your applets to different computers.

2. Create a new directory for your deployment files.
3. Expand the JAR file into the new directory.

#### ► [Details on this step](#)

**Note** If you want to put the class files your applets use into a JAR file, create the JAR file then add the variable `ARCHIVE="name.jar"` to the applet tags in your HTML files. You can specify multiple JAR files by delimiting them with a comma (,). Not all browsers support multiple JARs.

4. Copy the HTML files for your Web pages into the new directory.  
**Tip** Remember that the applet tags specify where your applets are relative to the location of the HTML files.
5. On your local computer, test your Web pages by opening them in a Web browser from outside of the Visual Cafe environment.
6. Put your files in a directory on the Web server, as they appeared in the directory on your local computer.
7. After completing the setup of your Web site, test your Web pages from remote computers.

You can also test it with different operating systems and Web browsers.

Here is another way:

1. Create a deployment directory on your local computer.
2. Put all of your applet class files, HTML files, and other supporting files (such as graphics files) in the deployment directory, as they appeared in your Visual Cafe project directory.

**Tip** Your applets should use relative URLs for graphics files so you can easily move your applets to different computers.

3. Enable your applet to access the class files it needs, including the Symantec class files. (Remember that the Web browser should provide access to standard Java class files.)

► Details on this step

If you want to put the class files your applets use into a JAR file, create the JAR file then add the variable `ARCHIVE="name.jar"` to the applet tags in your HTML files. You can specify multiple JAR files by delimiting them with a comma (,), but most browsers do not consistently support this.

If the class files are not in a JAR file, you can place the files in the deployment directory, preserving the directory structure and case of the class names

4. On your local computer, test your Web pages by opening them in a Web browser from outside of the Visual Cafe environment.
5. Put your files in a directory on the Web server, as they appeared in the directory on your local computer.
6. After completing the setup of your Web site, test your Web pages from remote computers.

You can also test it with different operating systems and Web browsers.

## Deploying applications

{button Concepts,AL(^Using\_JAR\_files\_overview;Object\_Library\_F1;Projects\_overview',0,','')} {button See Also,AL(^Deploying\_Applets\_how\_to;Determining\_What\_Class\_Files\_an\_Applet\_or\_Application\_Needs\_how\_to;Configuring\_UNIX-based\_Web\_Servers\_how\_to',0,','')}

After you complete an application in Visual Cafe, you are ready to deploy it. Requirements for different applications vary. However, here are some guidelines.

### To deploy your application in a JAR

1. Use the Project ► JAR command to create a [JAR file](#) containing your application and all supporting files, including Symantec **class** files.

#### ► [Details on this step](#)

**Tip** Your application should use relative URLs for graphics files so you can easily move your application to different computers.

2. On your local computer, test your application by running it from outside of the Visual Cafe environment.

To start your application, the JAR file must be in the class path. For example, you could type at a DOS prompt:

```
set classpath=%classpath%;name.jar
```

Then you can run your application:

```
java application-name
```

**java** invokes java.exe and, if needed, includes the complete path, for example, \visualcafe\java\bin\java. Your application name is the same as the name of the frame for the main application window without the **class** extension; it is case-sensitive and you might need to include the complete path.

For example:

```
set classpath=%classpath%;Amazing.jar
\visualcafe\java\bin\java AmazingTour
```

3. Test your application from remote computers.

You can also test it with different operating systems.

**Note** Your users need to obtain or you need to provide the [Java virtual machine](#) and standard Java class files. The Symantec Java virtual machine must be licensed from Symantec.

### To deploy your application outside of a JAR

Here is one way:

1. Use the Project ► JAR command to create a [JAR file](#) containing your application and all supporting files, including Symantec **class** files.

#### ► [Details on this step](#)

**Tip** Your application should use relative URLs for graphics files so you can easily move your application to different computers.

2. Create a new directory for your deployment files.
3. Expand the JAR file into the deployment directory.

#### ► [Details on this step](#)

**Note** You can put the class files your application uses into a JAR file, but remember that the JAR file must be added to the class path on the computer the application runs on.

4. On your local computer, test your application by running it from outside of the Visual Cafe environment.

To run your application:

```
java application-name
```

**java** invokes java.exe and, if needed, includes the complete path, for example, \visualcafe\java\bin\java. Your application name is the same as the name of the frame for the main application window without the **class** extension; it is case-sensitive and you might need to include the complete path.

For example:

**\\visualcafe\java\bin\java AmazingTour**

5. Test your application from remote computers.

You can also test it with different operating systems.

**Note** Your users need to obtain or you need to provide the [Java virtual machine](#) and standard Java class files. The Symantec Java virtual machine must be licensed from Symantec.

Here is another way:

1. Create a deployment directory on your local computer.
2. Put all of your application class files and other supporting files (such as graphics files) in the deployment directory, as they appeared in your Visual Cafe project directory.

**Tip** Your application should use relative URLs for graphics files so you can easily move your application to different computers.

3. Enable your application to access the class files it needs, including the Symantec class files. (Remember that the [Java virtual machine](#) should come with the standard Java class files.)

► [Details on this step](#)

You can put the class files your application uses into a JAR file, but remember that the JAR file must be added to the class path on the computer the application runs on.

If the class files are not in a JAR file, you can place the files in the deployment directory, preserving the directory structure and case of the class names

4. On your local computer, test your application by running it from outside of the Visual Cafe environment.

To run your application:

**java** *application-name*

**java** invokes java.exe and, if needed, includes the complete path, for example, \\visualcafe\java\bin\java. Your application name is the same as the name of the frame for the main application window without the **class** extension; it is case-sensitive and you might need to include the complete path.

For example:

**\\visualcafe\java\bin\java AmazingTour**

5. Test your application from remote computers.

You can also test it with different operating systems.

**Note** Your users need to obtain or you need to provide the [Java virtual machine](#) and standard Java class files. The Symantec Java virtual machine must be licensed from Symantec.

## Determining what class files an applet or application needs

{button Concepts,AL('Using\_JAR\_files\_overview;Object\_Library\_F1;Projects\_overview',0,'')} {button See Also,AL('Deploying\_Applets\_how\_to;Deploying\_Applications\_how\_to;Configuring\_UNIX-based\_Web\_Servers\_how\_to',0,'')}

You can learn what class files you need by creating a [JAR file](#) with the Visual Cafe JAR utility or by using SJ.

Remember that when you deploy you need to keep the class directory structure intact and you must use the same case in the class names. (Class names are case-sensitive.)

### To use the JAR command to get the class files your Java program needs

When you create a JAR file by choosing Project ► JAR, Visual Cafe adds the class files your Java programs require. You can use the JAR file to deliver your Java programs, or expand the JAR file with jar.exe to extract the class files from the JAR file. For more information, see [Creating a JAR file](#) and [Expanding a JAR file](#).

### To use SJ to determine what class files your Java program needs

The sj.exe utility enables you to easily figure out which class files are used by your applet or application. After your Java applet or application is finished, enter the following command at the DOS prompt (make sure that \visualcafe\bin is in your path):

```
sj.exe -make -cdb mainclass.cdb -depend listname.dep mainclass.java
```

*mainclass.java* is the name of the main class Java file in your project.

*listname.dep* is the file where the list of classes used by your applet or application will be generated. sj.exe also lists the name of the ZIP file (if any) where the class file was found. This helps you figure out what class files you would need to unzip from each class zip file used by your applet or application. The filename must have a .dep extension.

Even though the standard java.\* class files are logged in this file, you are not actually required to copy those to your Web server for your applets, as they are usually available with most Web browsers. For applications, the standard Java class files are part of Java Runtime Environment, which you can download from JavaSoft.

sj.exe takes additional command line options, so you can add additional class paths, and so on. See [Compiling from the command line](#) for more information.

## ▶ **Configuring UNIX-based Web servers**

{button Concepts,AL(^Using\_JAR\_files\_overview;Object\_Library\_F1;Projects\_overview',0','')} {button See Also,AL(^Deploying\_Applications\_how\_to;Deploying\_Applets\_how\_to;Determining\_What\_Class\_Files\_an\_Applet\_or\_Application\_Needs\_how\_to',0','')}

The following instructions for system administrators are guidelines only; they have been tested with Apache. After this is set up, all applets in the user's home HTML directory would have access to the Visual Cafe classes.

**IMPORTANT** The classes needed by Visual Cafe components are stored in symbeans.jar. You do not want to deploy using symbeans.jar, because it will affect the performance of your applets when it is downloaded. Instead, you want to deploy using just the classes needed by the components in your applets.

1. Create a UNIX directory, such as /home/symantecclasses. Make sure all users have read access to the directory.
2. Expand symbeans.jar, preserving the directory structure, and copy it to this UNIX directory.

### ▶ Details on this step

3. Create a symbolic link from /home/symantecclasses/symantec to the user's home HTML directory. For example:

**In -s /home/symantecclasses/symantec /home/joeuser/public\_html**

joeuser can now run applets from Web pages without the need to copy the full Symantec class structure to his public\_html directory.

## HTML and VC

## Using HTML files in the Visual Cafe environment

```
{button How  
To,AL("viewing_html_files_howto;Applets_step_overview;Adding_an_Applet_to_an_HTML_page_howto;Adding_Files_to_a_Proj  
ect_howto;Deleting_Files_from_a_Project_howto;Specifying_what_applets_to_run;Making_applets_run_in_viewer_or_browser;  
Adding_a_new_file_to_the_project_howto",0,"")} {button See  
Also,AL("Projects_overview;Overview_of_Visual_Caf;Differences_between_Applets_and_Applications;Using_Visual_Caf_as_Yo  
ur_Development_Environment;Working_Visually_with_Visual_Caf;The_Development_Life_Cycle_A_Two_Step_Process;Java_H  
TML_and_Visual_Caf",0,"")}
```

[Applets](#) run within another program, usually a Web browser. You add an [applet tag](#) to HTML code in a Web page to add that applet to the page.

Visual Cafe lets you run and debug applets within its environment without supplying an HTML file. However, to test your applet within an HTML page, you can specify an HTML file in which to run and debug the applet.

You can run and debug your applet in the Applet Viewer or a Web browser. A Web browser lets you view the HTML page and applet at the same time.

You can add the HTML files to a project as a useful organizational tool, but it is not required. Once an HTML file is added to the project, you can view it in the Object and Files view, open it quickly from the Project window, and see it in the project options.

If Visual Page is on your computer and the software has been set up properly, double-clicking an HTML file in the Project window (Objects view) launches Visual Page and visually displays the HTML file in Visual Page window. You can also view and edit an HTML file directly in the Source window of Visual Cafe; for example, you can double-click the HTML files in the Project window (Files view).

To add an applet to an HTML page, you can either manually add an applet tag to the file or drag the applet from the Visual Cafe Project window to an HTML page displayed in Visual Page.



## The relationship between Java and HTML

```
{button How  
To,AL('viewing_html_files_howto;Applets_step_overview;Adding_an_Applet_to_an_HTML_page_howto;Adding_Files_to_a_Proj  
ect_howto;Deleting_Files_from_a_Project_howto;Specifying_what_applets_to_run;Making_applets_run_in_viewer_or_browser;  
Adding_a_new_file_to_the_project_howto',0,',')} {button See  
Also,AL('HTML_and_Visual_Cafe_overview;Projects_overview;Overview_of_Visual_Caf;Differences_between_Applets_and_Ap  
plications;Using_Visual_Caf_as_Your_Development_Environment;Working_Visually_with_Visual_Caf;The_Development_Life_C  
ycle_A_Two_Step_Process',0,',')}
```

HTML stands for HyperText Markup Language. A markup language is a system of tags that preserve a document's structure so it can be disassembled, moved electronically, and reassembled when it reaches its final destination. The "Markup" part of HTML refers to tags that affect the way information in a document will be displayed. By using different HTML tags, you control text editing, formatting, and how graphics and animations are displayed.

Java is a programming language that allows you to design, build, and execute [applications](#) and [applets](#). Before they can be used, Java programs must be coded, compiled, and debugged similar to development with any other computer programming language.

Java is an [interpreted](#), object-oriented programming language with a syntax and structure similar to C++; it was designed specifically for the [Internet](#) by Sun. One of the fundamental features about the Java programming language is that it is [platform-independent](#). Java applets and applications will run on any computer platform that has Java installed on it.

An HTML document can contain links to Java programs so that you can display a Java program next to regular text in a [Web page](#). Because HTML now supports Java, users get the best of both worlds. Visual Cafe can provide the necessary HTML you need to run and view your applet within Visual Cafe. You can also create and edit HTML in Visual Cafe. However, for features specifically designed to assist you in writing HTML documents, you can use Symantec Visual Page, a visual HTML editing application.

### How HTML and Java work together: the applet tag

Applets are designed to be embedded in Web pages. Basic operations such as starting, stopping, and displaying the applet are all handled by the [Web browser](#). To tell the Web browser to display the applet, you have to put certain information about the applet in the HTML file.

For the Web browser to be able to display an applet, it requires some basic information, provided through the use of the [applet tag](#). Within the applet tag you specify where to find the **class** file, and how large to make the display space within the Web page. Like most HTML tags, the applet tag has an opening tag, `<APPLET>`, and a closing tag, `</APPLET>`. The applet tag is a link to a **class** file that contains [bytecode](#). The Web browser interprets the bytecode and displays the applet in the Web page.

In addition, there are three required attributes for the applet tag: [CODE](#), [WIDTH](#), and [HEIGHT](#).

Using the applet tag, you specify (at a minimum) the location of the Applet subclass and the dimensions of the applet's onscreen display area. When a Java-capable browser encounters an applet tag, it reserves onscreen space for the applet, loads the Applet subclass onto the computer the browser is executing on, and creates an instance of the Applet subclass. Next, the browser initializes the applet, and the applet is off and running.

The following listing shows the applet tag that includes the "Hello World" applet in an HTML page:

```
<HTML>  
<HEAD>  
<TITLE> A Simple Program </TITLE>  
</HEAD>  
<BODY>  
Here is the output of my program:  
<APPLET CODE="HelloWorldApplet.class" WIDTH=150 HEIGHT=25>  
</APPLET>  
</BODY>  
</HTML>
```

`<APPLET CODE="HelloWorldApplet.class" WIDTH=150 HEIGHT=25>` specifies that the browser load the applet whose compiled code is in the file named HelloWorldApplet.class. The browser looks for this file in the same directory as the HTML document that contains the tag.

When the browser finds the class file of the applet, it loads, creates, and displays an instance of the class. If you include an applet tag twice in one HTML page, the browser loads the class file once and creates and displays two instances of the class.

The WIDTH and HEIGHT attributes are like the same attributes in an `<IMG>` tag: they specify the size of the applet's display area in pixels. Most browsers do not let the applet resize itself to be larger or smaller than this display area.

To specify a JAR file in an HTML file, add the variable `ARCHIVE="name.jar"` to the applet tags. You can specify multiple JAR files by delimiting them with a comma (,). You can use `CODEBASE` variable to specify the location of class files and the `ALT` variable to specify text that will appear if a Web browser understands applet tags but cannot display an applet.

To ensure that the required Symantec custom classes are available to your applets, you need to supply them on your Web site. For instructions on deployment, see [Deploying applets](#).

### Passing parameters to applets from an HTML file

It is often helpful to have an applet receive information from an HTML document. This lets you customize how applets appear in Web pages. To pass information from an HTML document to a Java applet, use the `<PARAM>` tag.

The `<PARAM>` tag can appear between the HTML `<APPLET>` and `</APPLET>` tags. The `<PARAM>` tag has two attributes, [NAME](#) and [VALUE](#) tags, which are used to pass data to a Java applet:

```
<APPLET CODE="MyApplet.class" WIDTH=100 HEIGHT=100>
<PARAM NAME="Color" VALUE="red">
<PARAM NAME="Number" VALUE="81">
</APPLET>
```

The HTML file can pass multiple parameters. After the parameters are set in the HTML file, they can be retrieved by an applet with the [getParameter method](#):

```
String x=getParameter("Color");
```

In the example above, variable `x` is declared as type `String` to hold the `Color` parameter retrieved from the HTML document. It is necessary to specify the name of the parameter to retrieve from the HTML file.

The parameter is named `Color`:

```
<PARAM NAME="Color" VALUE="red">
```

The parameter name is specified as the argument passed to `getParameter` in the applet code:

```
getParameter("Color");
```

This results in the `getParameter` method returning the value `red` from the HTML file.



## Viewing and editing HTML files

```
{button Concepts,AL('HTML_and_Visual_Cafe_overview;Java_HTML_and_Visual_Caf;Projects_overview',0,'')} {button See  
Also,AL('Applets_step_overview;Adding_an_Applet_to_an_HTML_page_howto;Adding_Files_to_a_Project_howto;Deleting_File  
s_from_a_Project_howto;Specifying_what_applets_to_run;Making_applets_run_in_viewer_or_browser;Adding_a_new_file_to_th  
e_project_howto',0,'')}
```

If HTML files are included in your project, you can view the file and edit its HTML code from within Visual Cafe, and if installed, Visual Page.

1. Open the file by using one of these methods:
  - In the Project window (Object or Files view), double-click the HTML file name.
  - In the Project window (Object or Files view), right-click and choose Edit Source.
  - Choose File ► Open, then select the file and click Open.

The HTML file appears in the Source window. If you have installed Visual Page from the Visual Cafe software package, opening a file from Objects view opens the file in Visual Page; opening a file from the Files view opens it in the Source window.

2. View the file and make your edits in the Source window or Visual Page.

► [Details on using the Source window](#)

3. Save the file by choosing File ► Save.

## Adding an applet to an HTML page

```
{button Concepts,AL('HTML_and_Visual_Cafe_overview;Java_HTML_and_Visual_Caf;Projects_overview',0,'')} {button See  
Also,AL('Applets_step_overview;Adding_Files_to_a_Project_howto;Deleting_Files_from_a_Project_howto;Viewing_HTML_Files  
_howto;Specifying_what_applets_to_run;Making_applets_run_in_viewer_or_browser;Adding_a_new_file_to_the_project_howto',  
0,'')}
```

You can add an applet to an HTML page by:

- Adding an applet tag to the HTML code
- Dragging an applet from the Project window into an HTML page displayed in Visual Page

An applet tag is HTML code that causes an applet to appear in a Web page. It has the following basic format:

```
<APPLET code="applet.class" width=pixw height=pixh></APPLET>
```

*applet* is the name of the applet.

*pixw* is the number of pixels for the width.

*pixh* is the number of pixels for the height.

If you drag an applet to an HTML page displayed in Visual Page, Visual Page adds the applet tag for you.

Here are some additional parameters you might find useful:

*codebase=codebaseURL*

This optional attribute specifies the directory that contains the applet class file(s). The default is the location of the HTML file.

*archive=archiveList*

This optional attribute describes one or more archives, delimited by a comma (,), that contain classes and other resources that will be preloaded. The classes are loaded with the codebase, if specified. You can specify archives that are [JAR files](#).

*alt=alternateText*

This optional attribute specifies any text that should be displayed if the browser understands the APPLETTAG tag but cannot run Java applets.

Consult an HTML book for more information on the applet tag.

Source code

## Tools for working with source code

```
{button How
To,AL('Adding_Code_to_a_Java_Source_File_howto;binding_code_to_a_form_component_howto;class_browser_using_f1;hier
archy_editor_f1;Source_Window_F1;Editing_SearchReplace_overview;Migrating_10_to_11_event_model_howto',0,',')}
{button See
Also,AL('visual_Cafe_tools_overview;Form_Designer_F1;Object_Library_F1;Understanding_Workspaces;Working_with_Basic_
User_Interface_Components;Understanding_Component_Connections_overview;How_is_my_Work_Kept_In_Sync_overview',0
,',')}}}
```

Visual Cafe provides the Source Editor (available in the Source window and pane), Class Browser, and Hierarchy Editor to assist you in viewing and editing your Java source code and class hierarchy.

### Working with the Source Editor

The Visual Cafe Source Editor helps you create, examine, and modify your project source files. It is also designed to work with other Visual Cafe tools. You can access the Source Editor from the Source window, or from the Source pane of the Class Browser.

The Visual Cafe Source window is where you can create, display, and edit code. It is a full-featured text editor with many options and features particularly useful when editing Java source code. It provides for full Java [syntax](#) highlighting and flexible navigation tools. The Source window also plays an important role in [debugging](#) your project. You can use the Source window for monitoring program execution while debugging, and for setting breakpoints at design time.

Source windows are tied to individual [components](#) and [class](#) files. All methods in a single component are displayed in one Source window. The active component and a complete list of its [events](#) are displayed at the top of the window. If the event has not yet been bound to an [event handler](#), selecting an event name creates an event handler for that event. Events that have been bound to an event handler appear in bold text. When you select a bound event, the event handler associated with that event name is displayed in the Source window text box.

The Visual Cafe Source window and the Class Browser Source pane both share the same editing functionality. The editor uses standard Windows editing commands and has special features that make working with Java files easier. For example, the editor can automatically indent or unindent after braces and can check delimiters.

In addition, the Source Editor can display keywords and comments in special font styles and colors. This technique helps track errors in source code while you are editing. For example, an unmatched comment (`/*` without a matching `*/`) turns a large part of the code a different color, making it obvious where the problem lies. Also, keywords are easier to spot when they are in a different color or font style. Misspelled keywords can be caught immediately when they remain displayed in the default font.

Source windows are an integral part of the Visual Cafe environment and work together with other Visual Cafe windows to make application development easier. For example, Visual Cafe automatically saves all files open in Source windows when you rebuild your project. During compilation, error messages are displayed in the Messages window; when you double-click an error message, Visual Cafe opens a Source window on the corresponding source file, if necessary, and then jumps to the line in the source code that caused the error.

The Source Editor supplies standard Windows functions for cutting, copying, pasting, and deleting text. These functions can be accessed through either the Edit menu or the pop-up menu.

- ▶ [Click here for guidelines on adding custom code](#)

### Working with the Class Browser

[Classes](#) are the foundation of object-oriented programming. To make working with classes easier, Visual Cafe provides this powerful tool for working with classes.

The Class Browser is a three-pane window that lists all of the classes, methods, and data items contained in your program. This tool provides abstraction from the underlying source files by letting you navigate and edit your classes and members quickly. In the Class Browser you are free from the clutter of other member implementations in the same source file. The Class Browser helps you work with your source code in an organized way. It's not very easy to read a 27 page source file filled with references to multiple classes. You need to be able to keep track of what each of the classes does, what data is in each class, and how the methods within the classes work.

The Class Browser window shows the class hierarchy in your project and allows you to add classes, modify extension relationships, and view and edit class member [declarations](#) and definitions. The Class Browser window shows [data](#) and [methods](#) for each class and an edit area for working directly with the body of a method.

There are three panes in the Class Browser: the Classes, Members, and Source panes.

#### The Classes pane

The Classes pane displays all the classes that are part of the current project. By default the classes are displayed by [package](#). Your [project](#) files will be displayed as part of the default package when you start Visual Cafe because you have not created a package structure yet. In this case, the default package represents the entire project.

The classes may be listed alphabetically, by package, or hierarchically. You can choose to display your classes either alphabetically, or by package.

### **The Members pane**

The data and methods in a class are called members of that class. The Members pane of the Class Editor gives you an organized look at the data and methods the selected class is made of. The color of the icon indicates level of access for a class. A yellow icon indicates protected, green indicates it is a public class, and blue indicates it is a package.

Clicking a method or variable displays the source code for that member in the Source pane. You can drag and drop a member into the source pane; the member declaration is inserted into the source.

Right-clicking in the Members pane allows you to add new members to the class. You are presented with a dialog box where you can type the declaration of the method or data. You can also choose from a list of methods that can be overridden. The new members are automatically added to the source code for the class.

### **The Source pane**

The Source pane displays the source code for the member data or method that is selected in the Members pane. You can edit the code for your programs in the Source pane. All changes made to the class using the Class Browser will automatically be added to the associated source file.

### **Working with the Hierarchy Editor**

The Hierarchy Editor is a visual tool that provides you with a visual representation of the classes in your project, and their [inheritance](#) relationships.

All Java programs have a hierarchical structure. You can use the Hierarchy Editor to directly manipulate the class relationships of your projects, by simply dragging and dropping from one class to another.

**Note** Any changes made to classes or inheritance relationships in the Hierarchy Editor are automatically changed in the underlying source code. For that reason, you should be careful when making changes with the Hierarchy Editor. Visual Cafe does not allow you to change the structure of the existing Java hierarchy.

You can extend existing classes just by clicking and dragging. You can also create a new parent-child relationship by clicking a class and dragging to the desired parent class. If you double-click a class, that class is displayed in the Class Editor so you can view its data and methods.

## Source Editor



## Using the Source window

```
{button How  
To,AL('Customizing_your_enviro_appearance_Display_tab_F1_howto;Defining_auto_filetype_formatting_F1_howto;Adding_Cod  
e_to_a_Java_Source_File_howto',0,','')} {button See_Also,AL('Debugging_Your  
Program;Form_Designer_F1;Projects_overview;Property_Inspector_using_F1;Insert_class_dialog_F1;Visual_Caf_Tools_for_We  
orking_with_Classes_and_Components;Hierarchy_Editor_F1;Class_Browser_using_F1;How_is_my_Work_Kept_In_Sync_overvi  
ew',0,','')}
```

The Source window is the primary window for viewing, writing, and editing source code and for debugging. This window allows you to create, display, and edit Java and HTML code, and text files. Navigation aids help you move through your code and full Java syntax highlighting makes it easy to find code areas.

The Object field displays the name of the current active object. You can use the drop-down list to select other objects in the source file.

In the Events/Methods drop-down box, Visual Cafe displays all [events](#) that are associated with the active component's class. Events that have code associated with them appear in boldface text. You can select an [event handler](#) from this list to edit or create it, and the associated code displays in the window.

Keywords, comments, and Java commands are colored for easy editing. By default, comments are dark green, Java language keywords are blue, and standard code text is black.

```
{button ,JI('VCAFE.HLP','Adding_Code_to_a_Java_Source_File_howto')} Click here for coding guidelines
```

### To display the Source window

- Select a file in the Project window, then choose Object ► Edit Source, or right-click and choose Edit Source.
- Double-click a file in the Packages or Files view of the Project window. (If Visual Page is not installed, double-clicking an HTML file in the Objects view opens a Source window.)
- While the Form Designer is the active window, choose Object ► Edit Source, or right-click and choose Edit Source.
- Double-click in the Form Designer.
- In the Classes pane of the Class Browser, select a class then choose Classes ► Go to Source, or right-click a class and choose Go to Source.
- In the Hierarchy Editor, select a class then choose Hierarchy ► Go to Source, or right-click a class and choose Go to Source.
- Open a file by choosing File ► Open.

### To cut, copy, or paste source code

You can copy and move text within the same window, or between Source Editor windows, including the Source window and the Class Browser Source pane.

- Select code, then choose Edit ► Cut or Copy, or right-click and choose Cut or Copy.
- Position the cursor where you want to paste, then choose Edit ► Paste, or right-click and choose Paste.
- Drag a block of selected text to move it.
- Press CONTROL while dragging a block of selected text to copy the text. (A + appears over the cursor when a copy operation is being performed.)

### To create or go to an event or method

1. In the Objects drop-down list of the Source window, choose an object.
2. In the Events/Methods drop-down list, choose the event or method.  
Existing events and methods are shown in bold. If you choose an event or method that is not bold, it is created for you.  
**Note** If you choose an event, Visual Cafe adds the [event handler](#) and other code. See [Adding an event handler to a component](#) for more information.

### To go to a definition

1. Select or click in a class or member, then choose Search ► Go to Definition, or right-click and choose Go to Definition.
2. If a Members window displays, select the member you want to view.  
A Class Browser window appears.

### ► [Details on using the Class Browser](#)

### To search or replace in a file

- While the Source window is active, choose a command from the Search menu.

▶ [Details on this task](#)

**To search in multiple files**

- While the Source window is active, choose Search ▶ Find in Files.

▶ [Details on this task](#)

**To get help on a Java keyword or method**

- Position the cursor on a keyword or method, then press F1 to display a list of associated topics in the Java Reference help.
- To add help files, see [Defining the help file set](#).

**To set format options for all Source windows**

- Choose Tools ▶ Environment Options
- ▶ Format and select the options you want.
- ▶ [Details on this step](#)

**To set format options for the current file**

- While the file is displayed in the Source window, choose Source ▶ Format Options, or right-click and choose Format Options. Complete the dialog box.
- ▶ [Details on this step](#)

**To set editing options for all Source windows**

- Choose Tools ▶ Environment Options
- ▶ Edit and select the options you want.
- ▶ [Details on this step](#)

**To set edit-key assignments for all Source windows**

- Choose Tools ▶ Environment Options
- ▶ Keyboard and set the options you want.
- ▶ [Details on this step](#)

**To set display options for all Source windows**

- To change the source code text display, such as colors for comments, choose Tools ▶ Environment Options
- ▶ Display. The Editing tab also has options that apply to the Source window.
- ▶ [Details on this step](#)

**To indent or unindent code**

- Select the lines of code, then choose Source ▶ Indent or Unindent.  
The code is moved one tab position.

**To convert tabs to spaces or spaces to tabs**

- Select the code, then choose Source ▶ Tabs to Spaces or Spaces to Tabs.  
All tab characters in the selected text become spaces, or spaces become tabs. The number of spaces for each tab character depends on the Tab width value for the format options (which were described previously).

**To change text to all uppercase or lowercase letters**

- Select the code, then choose Source ▶ Uppercase or Lowercase.

**To set a breakpoint for debugging**

- Select a line of code, then choose Source ▶ Set Breakpoint, or right-click and choose Set Breakpoint.

**To set a conditional breakpoint for debugging**

- Select a line of code, then choose Source ▶ Set Conditional Breakpoint and complete the dialog box.
- ▶ [Details on this step](#)

**To clear a breakpoint**

- Select a line of code with a breakpoint, then choose Source ▶ Clear Breakpoint, or right-click and choose Clear Breakpoint.

**To evaluate an expression during debugging**

- Select an expression, then choose Source ▶ Evaluate Expression, or right-click and choose Evaluate Expression. Complete the dialog box.
- ▶ [Details on this step](#)



## Using the Format Options dialog box

```
{button Concepts,AL('Debugging Your Program;Source_Window_F1',0,'')} {button See  
Also,AL('GoTo_Buffer_Dialog_F1',0,'')}
```

### Source ▶ Format Options Source

#### ▶ Go to Buffer ▶ Options

The options in this window allow you to define a format style for the current editing window/buffer. Options are active until the associated source window/buffer closes.

1. Set the standard format options.

The formatting style options on this dialog box are the same as on the Environment Options, Format Tab. See [Defining Automatic File Type Formatting](#) for complete option information.

2. Set the remaining options as needed.

Option	Description
Use as Default for .java	Assign the current settings as the default setting.
Read only	The buffer can not be changed.
Keep file in memory	No prompts are given for saving on close or changes. Permanently stores file in memory.

## Class Browser

## Using the Class Browser

```
{button
Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components;Adding_Code_to_a_Java_Source_File_howto',0,
',';')} {button See
Also,AL('Popup_menu_Class_Pane_F1;Popup_menu_Member_Pane_F1;Source_Window_F1;Hierarchy_Editor_F1;How_is_my
_Work_Kept_In_Sync_overview',0,',';')}
```

The Class Browser is a three-pane window that lists the Java classes in your project and the methods and data members contained within each class.

The Class Browser allows you to quickly navigate, edit, and add classes. You only see the methods and data members for the selected class, and only the Java code for the selected member. The isolation of member source code provides an extra degree of security by ensuring that you do not unintentionally change code outside of the object's scope. Each member has a color-coded icon to indicate its access privileges (green is public, yellow is protected, blue is package, and red is private).

Both the Classes and Members panes support keyboard incremental searches. As you type the name of a class or member, the list of matching items is refined until the class or member you want is automatically selected.

You can display classes and members in a variety of views and filter the items that are displayed. When you are showing classes by a hierarchical view and a class implements one or more interfaces, the class displays below each interface.

Whereas when you work in the Source window you are asked if you want to save changes when you close the window, in the Class Browser you are not prompted. Any changes you make to classes or inheritance relationships modify the source code immediately as you move between members or classes.

The Source pane provides the same editing features as the Source window.

**Note** Visual Cafe does not allow you to change the structure of the standard Java hierarchy or the source code of standard Java classes.

### To display the Class Browser

- While the project you want to view is active, choose View (or Window) ► Class Browser.

### To locate a class in the Classes pane

- Click in the Classes pane, then type the class name. For example, to locate `java.awt.FlowLayout`, type **flo**. Press TAB to go to the next entry with that letter sequence.

As you type, selections are made to match the text you enter. As you continue typing, the search is refined.

The class you are searching for is highlighted.

#### Note

- In the Class Browser, the search is conducted by package and only expanded packages are searched. So if you want to locate a class in a particular package, you need to expand the package by clicking the +, then start typing. If you want to exclude a package from a search, then collapse the package (click the -).
- If the class you want is not displayed in the pane, you might need to change what classes are displayed, as described next.

### To change what classes are displayed in the Classes pane

1. In the Classes pane, choose Classes ► Options, or right-click and choose Options.
2. In the Class Options dialog box, set the options you want:
  - In the Group/Sort tab, specify whether you want to group classes alphabetically, hierarchically, or by package.
  - In the Filter tab, specify where you want to show imported classes.

### To create a new class with the Class Wizard

1. In the Classes pane, optionally select a class you want the new class to extend.
2. Right-click in the Classes pane and choose Insert Class.  
By the default in the Environment Options, you can also press INSERT.  
The Insert Class Wizard appears.
3. Complete the Insert Class Wizard.

#### ► Details on this step

The new class appears in the Class Browser display and is added to the project.

### To edit an existing class with the Class Wizard

1. In the Classes pane, select a class you want view or edit.
2. Choose Classes ► Edit Class, or right-click in the Classes pane and choose Edit Class.  
The Edit Class Wizard appears.
3. Complete the Edit Class Wizard.

#### ► [Details on this step](#)

### To view or edit the source code for a class

You can view source code in the Source pane of the Class Browser or in a Source window. The Source pane has the same editing options as the Source window.

- To display source code in the Source pane, select a class in the Classes pane then a member in the Members pane.
- To display source code in a Source window, from the Classes pane, select a class then choose Classes ► Go to Source, or right-click a class and choose Go to Source.

#### ► [Details on using the Source window](#)

### To delete a class inheritance

1. In the Classes pane, choose Classes ► Options, or right-click and choose Options.
2. In the Group/Sort tab, specify a Class Grouping of Hierarchically, then click OK.

When you are showing classes by a Hierarchical view and a class implements one or more interfaces, it displays below each interface.

3. In the Classes pane, select a class, then press DELETE.

If you delete a class that is specified below an interface, that interface is deleted from the class. If you delete a class below a class, the class now inherits directly from java.lang.Object.

### To delete a class

- In the Classes pane, select a class, then press DELETE.

### To locate a method or data variable in the Members pane

1. Select a class in the Classes pane.

**Note** If the class you want is not displayed in the pane, you might need to change what classes are displayed, as described previously.

2. Click in the Members pane, then type the method or data variable name. For example, to locate the CENTER data variable for the FlowLayout class, type `cen`. Press TAB to go to the next entry with that letter sequence.

The method or data variable you are searching for is highlighted. The source code is displayed in the Source pane.

Each member has a color-coded icon to indicate its access privileges (green is public, yellow is protected, blue is package, and red is private).

**Note** If the method or data variable you want is not displayed in the pane, you might need to change what members are displayed, as described next.

### To change what members are displayed in the Members pane

1. In the Members pane, right-click and choose Options. Or while the Class Browser is the active window, choose Classes ► Options.
2. In the Class Options dialog box, set the options you want:
  - In the Group/Sort tab, specify whether you want to sort members by access (public, private, protected, and package), alphabetically, or not at all.
  - In the Group/Sort tab, specify whether you want to group members by kind or by access.
  - In the Filter tab, specify what members you want to show (choose from public, private, protected, package, final, static, and regular) and if you want to display their types.
  - In the Inheritance tab, specify whether you want to show inherited methods, and if so, if you want to display full method names or show overridden methods.

### To create a new member from the Members pane

1. In the Class pane, select a class you want to add a method or data variable to.

**Note** If the class you want is not displayed in the pane, you might need to change what classes are displayed, as described previously.

2. Right-click in the Members pane and choose Insert Member. Or while the Class Browser is the active window, choose Insert ► Member.

By default in the Environment Options, you can also press INSERT.

The Insert Member dialog box appears.

3. Type the declaration and choose the access type, then click OK.

For example, `int myVar ()` is a valid declaration you could type. The member appears in the Members pane.

4. Select the member in the Members pane to view and edit source code in the bottom editing window.

#### To view attributes of a member from the Members pane

1. In the Class pane, select a class that contains the member.

**Note** If the class you want is not displayed in the pane, you might need to change what classes are displayed, as described previously.

2. Select the member in the Members pane.

**Note** If the method or data variable you want is not displayed in the pane, you might need to change what members are displayed, as described previously.

3. Right-click in the Members pane and choose Member Attributes. Or while the Class Browser is the active window, choose Classes ► Member Attributes.

The Member Attributes dialog box displays.

4. Change the access type if needed, then click OK.

#### To delete a member from the Members pane

1. In the Class pane, select a class the contains the member.

**Note** If the class you want is not displayed in the pane, you might need to change what classes are displayed, as described previously.

2. Select a member or shift-click multiple members in the Members pane.

**Note** If a method or data variable you want is not displayed in the pane, you might need to change what members are displayed, as described previously.

3. Right-click in the Members pane and choose Delete Member. Or while the Class Browser is the active window, choose Classes ► Delete Member.

The member is deleted from the class.

#### To view or edit the source code of a member

You can view source code in the Source pane of the Class Browser or in a Source window. The Source pane has the same editing options as the Source window.

- To display source code in the Source pane, select a class in the Classes pane then a member in the Members pane.
- To display source code in a Source window, from the Classes pane, select a class then choose Classes ► Go to Source, or right-click a class and choose Go to Source.

#### ► [Details on using the Source window](#)

#### To rename a class or member

1. Select the class or member in the Classes or Members pane. Then click it again.

2. When an edit box appears, type the new name or edit the existing name.

The constructor is renamed for you.

#### To add a class or member by dragging it into source code

- Select the class or member in the Classes or Members pane, then drag it into the Source pane or a Source window.

The full class name, full method signature, or data variable is added at the location you drop it.



## Using the Member Attributes dialog box

```
{button Concepts,AL('Class_Browser_using_F1',0,'')} {button See Also,AL('Insert_class_dialog_F1',0,'')}
```

### Classes ▶ Member Attributes

Use this window to change the [access type](#) of selected members.

The class declaration is modified and the Members display is updated to reflect the change.

If you are editing several members simultaneously and the original access specifiers are not identical, a Don't Change option displays. This option lets you change member attributes without affecting the original access of each member.

# Hierarchy Editor



## Using the Hierarchy Editor

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components;Adding_Code_to_a_Java_Source_File_howto',0,'')} {button See Also,AL('Class_Browser_using_F1;Source_Window_F1;How_is_my_Work_Kept_In_Sync_overview',0,'')}
```

The Hierarchy Editor shows a visual representation of the classes in the inheritance hierarchy. It shows the classes that the objects in your project inherit from; you can optionally show imports as well.

From the Hierarchy Editor, you can do the following:

- Change the inheritance hierarchy by selecting an inheritance line and dragging it to a different class.
- Remove an inheritance.
- Create a new class or edit an existing class with the Class Wizard.
- Select a class and view its source in a Source window or the Class Browser.
- Locate a class in the display by typing its name.

Changes made to classes or inheritance relationships are automatically changed in the underlying source code and in all open windows in the Visual Cafe environment.

**Note** Visual Cafe does not allow you to change the structure of the standard Java hierarchy or the source code of standard Java classes.

### To display the Hierarchy Editor

- While the project you want to view is active, choose View (or Window) ► Hierarchy Editor.

### To enable and disable viewing imports

- While the Hierarchy Editor is the active window, choose Hierarchy ► View Imports or right-click and choose View Imports to toggle the display.

### To locate a class in the display

- While the Hierarchy Editor is the active window, type the class name. For example, to locate `java.awt.FlowLayout`, type **flo**. As you type, selections are made to match the text you enter. As you continue typing, the search is refined. The class you are searching for is highlighted.

### To change the inheritance hierarchy

- Click the line between two classes, then drag the line by its anchor to another class. The class on the right now derives from the class you connected it to. This changes its source code.

### To remove an inheritance

- Select the line between a parent and base class, then right-click and choose Remove Inheritance. The class now extends directly from `java.lang.Object`.

### To create a new class

1. Optionally select a class you want the new class to extend.
2. Drag from the class into the background space, or right-click and choose Insert Class. The Insert Class Wizard appears.
3. Complete the Insert Class Wizard.

#### ► Details on this step

The new class appears in the Hierarchy Editor display and is added to the project.

### To edit an existing class

1. Select a class you want view or edit.
2. Right-click and choose Edit Class. Or choose Hierarchy ► Edit Class. The Edit Class Wizard appears.
3. Complete the Edit Class Wizard.

#### ► Details on this step

### To view a class in a Source window

- Select a class then choose Hierarchy ► Go to Source, or right-click a class and choose Go to Source.

**To view a class in the Class Browser**

- Double-click a class in the Hierarchy Editor.



## Using ZIP files in Visual Cafe

```
{button How To,AL('Adding_Files_to_a_Project_howto',0,'','concept')} {button See  
Also,AL('Deleting_Files_from_a_Project_howto;Projects_overview',0,'','')}
```

Visual Cafe can locate **class** files placed in a **zip** file. The files must be on your class path, and you must preserve the directory structure of the packages.

## Adding Code to a Java Source File

## Adding code to a Java source file

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL('Binding_Code_to_a_Form_Component_howto;Binding_Code_to_a_Menu_Command_howto',0,','')}
```

Although you can create some applets with Visual Cafe that do not require any custom Java code, you might need to add code for advanced applets and for applications. For example, you can add [custom code](#) for error handling, event control, and complex [component](#) relationships and behavior. You can bind [event handlers](#) to any component and to menu commands.

You can use the Visual Cafe visual environment to quickly create your form layouts. If you do not want to use the visual environment, or you are finished using the visual environment and want to stop Visual Cafe from automatically generating Java code, you can turn off the visual environment for a file or for all new files that are added to a project. This RAD on/off feature is available in Visual Cafe Professional edition. See [Enabling and disabling RAD and automatic code generation](#) for more information.

If you are using the visual environment of Visual Cafe, before you add custom code, you should create your project and use Visual Cafe's powerful visual tools to create your [forms](#). You can add components to your project, arrange components in the Form Designer, design menus in the Menu Designer, modify the look of individual components with the Property List, and add [interactions](#) between components or a component and itself with the Interaction Wizard. It is a good idea to do as much as you can with the Visual Cafe tools before you add your custom code.

When you are satisfied with the layout of your project forms, you can then add any necessary code enhancements using the Source window or Class Browser.

Visual Cafe places special comments in the source code to indicate the beginning and end of blocks of code that it needs to manage. These code blocks start with `//{{` and end with `//}}`. For example, if you add a button to a form, Visual Cafe generates the following code:

```
//{{DECLARE_CONTROLS  
java.awt.Button button1;  
//}}  
  
//{{INIT_CONTROLS  
button1 = new java.awt.Button("button");  
button1.setBounds(107,50,61,56);  
add(button1);  
//}}
```

The comment tag `//{{INIT_CONTROLS` is generated by Visual Cafe to mark the location where components are created and initialized. The comment tag `//{{REGISTER_LISTENERS` marks the location where [listeners](#) are registered.

Avoid adding to or modifying custom code within code blocks that are regenerated (between the `//{{` and `//}}` comment tags). To modify the code within these tags, only use code syntax that matches what Visual Cafe can generate, or Visual Cafe might be unable to back parse your Java file into its visual environment.

Also avoid moving these code blocks. But if you do, be sure to move the entire code block, including the special comment tags.

Whenever possible, make object changes using Visual Cafe, versus adding code directly to the source file. For example, adding components, classes or class members, and changing component properties can be done through the Component Library or Palette, using a menu selection, or making a change in the Property List.

**Caution** [Custom code](#), [interactions](#), and [event bindings](#) are not deleted from the source file when you delete a component. You must manually maintain any file that contains custom code.

## ▶ Binding code to a component

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL('Editing_Event_Methods_howto;Connecting_Form_components_howto;Adding_Code_to_a_Java_Source_File_howto',  
0,','')}
```

Every [component](#) has a set of events that users can trigger at runtime. To bind code to an event, you create an [event handler](#) in the source file and add [custom code](#). When the event occurs, the code in your event handler executes.

Visual Cafe changes the source code in four ways when you add an event handler from the Source window:

- First, Visual Cafe generates an [adapter](#) or [listener](#) implementation for the event. If one was already generated, it is used with the new interaction.
- Second, in the adapter/listener class, Visual Cafe generates a check for the object requesting the handling of the event and a call to the event handler.
- Third, Visual Cafe instantiates this adapter/listener class and generates the registration (specifically, `object.addKeyListener` or `object.addKeyListenerAdapter`) after the comment tag REGISTER\_LISTENERS. If the adapter/listener class has already been instantiated, it is used.
- Fourth, an event handler is generated. If the event handler already exists, it is used.

If instead you use the Interaction Wizard to create an [interaction](#), Visual Cafe makes the four modifications mentioned previously, plus the interaction specified in the wizard is generated in the event handler. See [Using the Interaction Wizard](#) for more information.

To add an event handler from the Source window:

1. Open the Source window for the component by using one of these methods:
  - Select the component in the Project window, then choose Object ▶ Edit Source, or right-click and choose Edit Source.
  - While the form with the component is displayed in the Form Designer (which is the active window), choose Object ▶ Edit Source, or right-click and choose Edit Source.
  - Double-click in the Form Designer while the form with the component is displayed.

2. In the Source window, choose the component from the Objects drop-down list.

3. In the Events/Method drop-down list of the Source window, select the event that you want to bind to.

The event handler is added to the source file. The cursor insertion point is positioned inside the event handler. Code is also added to the proper listener so that when an event occurs in the object the event handler gets executed.

4. In the event handler, replace the placeholder text `// to do: code goes here` with appropriate Java code.

## Binding KeyPress events

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,',')} {button See  
Also,AL('Button_component;Editing_Menus_howto;Adding_Code_to_a_Java_Source_File_howto',0,',')}
```

You can configure buttons to accept keyboard input, such as CTRL+C. When certain keys are pressed, it would be the same as clicking the button; these are sometimes called *hot keys*. Here is a code sample:

```
/*  
This simple extension of the java.awt.Frame class  
contains all the elements necessary to act as the  
main window of an application.  
*/  
  
import java.awt.*;  
  
public class Frame1 extends Frame  

```

```

miOpen.addActionListener(lSymAction);
miAbout.addActionListener(lSymAction);
miExit.addActionListener(lSymAction);
SymKey lSymKey = new SymKey();
addKeyListener(lSymKey);
//}}
}

public Frame1(String title)
{
    this();
    setTitle(title);
}

public synchronized void show()
{
    move(50, 50);
    super.show();
}

static public void main(String args[]) {
    (new Frame1()).show();
}

public void addNotify()
{
    Dimension d = getSize();

    super.addNotify();

    if (fComponentsAdjusted)
        return;

    // Adjust components according to the insets
    setSize(insets().left + insets().right + d.width, insets().top + insets().bottom + d.height);
    Component components[] = getComponents();
    for (int i = 0; i < components.length; i++) {
        Point p = components[i].getLocation();
        p.translate(insets().left, insets().top);
        components[i].setLocation(p);
    }
    fComponentsAdjusted = true;
}
//Used for addNotify check.
boolean fComponentsAdjusted = false;

//{{DECLARE_CONTROLS
java.awt.FileDialog openFileDialog1; //}}

//{{DECLARE_MENUS
java.awt.MenuBar mainMenuBar;
java.awt.Menu menu1;
java.awt.MenuItem miNew;
java.awt.MenuItem miOpen;
java.awt.MenuItem miSave;
java.awt.MenuItem miSaveAs;
java.awt.MenuItem miExit;
java.awt.Menu menu2;
java.awt.MenuItem miCut;
java.awt.MenuItem miCopy;
java.awt.MenuItem miPaste;
java.awt.Menu menu3;
java.awt.MenuItem miAbout;
//}}

class SymWindow extends java.awt.event.WindowAdapter
{
    public void windowClosing(java.awt.event.WindowEvent event)

```



```

    {
        Object object = event.getSource();
        if (object == Frame1.this)
            Frame1_WindowClosing(event);
    }
}

void Frame1_WindowClosing(java.awt.event.WindowEvent event)
{
    hide();           // hide the Frame
    dispose();       // free the system resources
    System.exit(0); // close the application
}

class SymAction implements java.awt.event.ActionListener
{
    public void actionPerformed(java.awt.event.ActionEvent event)
    {
        Object object = event.getSource();
        if (object == miOpen)
            miOpen_Action(event);
        else if (object == miAbout)
            miAbout_Action(event);
        else if (object == miExit)
            miExit_Action(event);
    }
}

void miAbout_Action(java.awt.event.ActionEvent event)
{
    //{{CONNECTION
    // Action from About Create and show as modal
    (new AboutDialog(this, true)).show();
    //}}
}

void miExit_Action(java.awt.event.ActionEvent event)
{
    //{{CONNECTION
    // Action from Exit Create and show as modal
    (new QuitDialog(this, true)).show();
    //}}
}

void miOpen_Action(java.awt.event.ActionEvent event)
{
    //{{CONNECTION
    // Action from Open... Show the OpenFileDialog
    openFileDialog1.show();
    //}}
}

class SymKey extends java.awt.event.KeyAdapter
{
    public void keyPressed(java.awt.event.KeyEvent event)
    {
        Object object = event.getSource();
        if (object == Frame1.this)
            Frame1_KeyPress(event);
    }
}

void Frame1_KeyPress(java.awt.event.KeyEvent event)
{
    // to do: code goes here.
    System.out.println("Button Key Press :" + event.getKeyText(event.getKeyCode()));
}
}

```

## Searching in a File


## Searching and replacing in the Source window

```
{button How To,AL('Find_dialog_F1;Replace_dialog_F1',0,','')} {button See  
Also,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components;Source_Window_F1;Customizing_Editing_windows_E  
diting_tab_F1;Defining_auto_filetype_formatting_F1_howto;Find_in_Files_dialog_F1',0,','')}
```

The Source Editor has text-based search and replace functions that let you search the active window for a string and replace one string with another. In addition, the global find feature provides a powerful means of locating a string in any set of files.

You can also jump to specific points in a file by using commands from the Search menu.


### To find a string

1. Optionally select text in the Source window.  
The selected text becomes the "Find what" criteria.
2. While the Source window is active, choose Search ► Find.
3. Type the string you want to search for in the Find what field or choose a previous string from the drop-down list, and select any options you want.  
By checking Regular Expression in the Find dialog box, you can use the wildcard characters in [regular expression syntax](#). Regular expressions permit more powerful text searches. The  button lists all available regular expression syntax. When you select from the list, the regular expression option is automatically checked.
4. Click Next to search forward or Previous to search backward.

### To repeat the search in the same direction

- Choose Search ► Find Again.

### To replace a string with a different string

1. Optionally select text in the Source window.  
The selected text becomes the "Find what" criteria.
2. While the Source window is active, choose Search ► Replace.
3. Type the string you want to search for in the Find what field or choose a previous string from the drop-down list.
4. Type the substitution string in the Replace field or choose a previous string from the drop-down list.
5. Select any options you want.  
If you select Confirm changes, the editor scrolls the display to each occurrence of the search string, selects it, and asks whether you want to replace it by displaying the Confirm Replacement dialog box. If you do not select this option, every occurrence of the string is replaced when you click Replace.  
By checking Regular Expression, you can use the wildcard characters in [regular expression syntax](#). Regular expressions permit more powerful text searches. The  button lists all available regular expression syntax. When you select from the list, the regular expression option is automatically checked.
6. Click Replace.

**Tip** Use Edit ► Undo Search to undo the entire set of replacements of the search string.

### To jump to a matching delimiter

A common problem in source code is parentheses ( ( ) ), brackets ( [ ] ), and braces ( { } ) that do not match. Visual Cafe lets you search for a matching delimiter.

1. In the Source window, position the insertion point in front of one of the delimiters.
2. Choose Search ► Go to Matching Delimiter.  
The insertion point moves to the other half of the pair.

**Tip** If you have chosen the Check delimiters option, which can be set for a file by choosing Source ► Format Options or globally with Tools

#### ► Environment Options

► Format, the Source Editor performs delimiter checking for you automatically, including text in strings and comments. If you type a right parenthesis, right square bracket, or right brace, the editor briefly highlights the corresponding left delimiter. If no matching delimiter is found, an error message is displayed in the status bar of the editor.

### To jump to a specific line

1. While the Source window is active, choose Search ► Go To Line.  
The Go To Line dialog box opens.
2. Type the line number in the text box and click OK.  
The editor moves the insertion point to the beginning of the specified line.

### To jump to a function

1. Choose Search ► Go to Function.  
The Go to Function dialog box opens.
2. Select a function name from the list or type a function name.  
You can change how function names display in the list with the Show member name first option.
3. Click OK.  
The insertion point moves to the beginning of the specified function.

### To jump to an event or method

1. In the Objects drop-down list of the Source window, choose an object.
2. In the Events/Methods drop-down list, choose the event or method.  
Existing events and methods are shown in bold. If you choose an event or method that is not bold, it is created for you.

### To go to a buffer

- Choose Search ► Go to Buffer and complete the dialog box.
- [Details on this step](#)

### To set a bookmark

- Choose Search ► Bookmarks and complete the dialog box.
- [Details on this step](#)

### To search for a string in multiple files

You can choose to search:

- all source files in the current project
  - all files listed in the Find in Files window (which opens after the first search)
  - all files matching the criteria you specify, including filename, directory, date, time, and file attributes
1. Choose Search ► Find in Files.
  2. Choose what files to search.
- [Details on this step](#)
3. Set advanced search options as needed.
- [Details on this step](#)

### To compare two files

- Choose Tools ► Compare Files and complete the dialog box.
- [Details on this step](#)

### To go to a definition

1. Select or click in a class or member, then choose Search ► Go to Definition, or right-click and choose Go to Definition.
  2. If a Members window displays, select the member you want to view.  
A Class Browser window appears.
- [Details on using the Class Browser](#)

## Using the Find dialog box

```
{button See Also,AL('Find_in_Files_dialog_F1',0,'','')}
```

### Search ► Find

Use the Find dialog box to search the current file for a text string.

1. Enter the search pattern in the Find What field.

You can initialize the pattern by selecting text before choosing Find. (The text must not span a line break.) You can also use the drop-down list to select text from previous search strings.

The pattern may also be a [regular expression](#). The Regular Expression option is selected by default.

2. Select appropriate search options. If no options are selected, a match is any string that matches the search criteria of any case.

Option	Description
Match case	Only find text strings that match the search criteria exactly, including case.
Match whole words only	Search for any string that matches the search criteria and is preceded and appended by a blank space. The Source Editor considers text a match only if it appears exactly like the search string, not as a portion of a larger string. For example, <b>in</b> matches <b>in</b> , but not <b>include</b> .
Regular Expression	Accepts regular expression wildcards in the expression syntax. Click the ► button to display a list of valid special characters. <b>Tip</b> Leave Regular Expression deselected (for speed) if you simply want to locate a string.

3. Search the file for matches by using the Next and Previous buttons.

## Using the Replace dialog box

{button See Also,AL('Find\_in\_Files\_dialog\_F1',0,'','')}

### Search ► Replace

Use the Replace dialog box to search the current file for a text string and perform a string replacement.

1. Specify the search criteria in the Find What field.
2. Specify the replacement string in the Replace With field. You cannot use wildcard characters in a replacement string.
3. Click Replace.

The file is sequentially scanned for matching strings and the matching string is replaced with the replacement text.

You can use the Undo command to undo the entire set of replacements of the search string.

You can select these search options:

Option	Description
None	Search for any string matching the search criteria. Case is not considered.
Match-case	Only find text strings that match the search criteria exactly, including case.
Match whole words only	Search for any string that matches the search criteria and is preceded and appended by a blank space.
Regular expression	This option allows you to define a search string using regular expression wildcard syntax. Click the ► button to display a list of valid special characters.
Confirm changes	You are prompted before each replacement is performed. If this option is not selected, the editor replaces all occurrences of the search string without confirmation messages.
Search only in selection	This option is valid if you have a block of text selected in the editing window. This option limits the scope of the search to the text in the selected block.



## Using the Go to Line dialog box

```
{button Concepts,AL(^Debugging Your Program;Source_Window_F1',0','')} {button See  
Also,AL(^Goto_Function_F1;Bookmark_window_F1;Find_dialog_F1;Search_Menu_F1',0','')}
```

### Search ▶ Go to Line

The Go to Line dialog box allows you to specify a line number in the current source file that you want to scroll to.

If any text is currently selected, the selection is extended to include that line.



## Using the Go to Function dialog box

```
{button Concepts,AL('Debugging Your Program;Source_Window_F1',0,'')} {button See  
Also,AL('Goto_Line_Window_F1;Bookmark_window_F1;Find_dialog_F1;Search_Menu_F1',0,'')}
```

### Search ▶ Go to Function

Use the Go to Function dialog box to select a function to go to.

- Type the function name, or select a function name from the list. When you click OK, the insertion point will be moved to the beginning of the specified function.

Select the Show Member Name to change the method display to show the name of the member first. The default is the form name first.



## Using the Go To Buffer dialog box

{button Concepts,AL('Debugging Your Program;Source\_Window\_F1',0,'')} {button See Also,AL('Bookmark\_window\_F1',0,'')}

### Search ► Go to Buffer

The Go to Buffer dialog box allows you to switch to an editing buffer. A buffer is created for each editing window, Source window, and Class Browser.

1. Select the Category of buffers that you want to view:

Option	Description
File Buffer	A Source window to edit an entire file.
Member Buffer	A Source pane to edit a particular member definition.

2. Select a buffer from the list.
3. Perform any appropriate task(s):

To	Click
Make the selected buffer's window current.	Go To
Display the Current Buffer Options dialog box to define automatic buffer formatting and maintenance.	Options
Save the buffer's content with its current file name	Save
Save the buffer's content with a new name.	Save As
Close the selected buffer's window and prompt you if there are unsaved changes.	Close

## Using the Bookmark dialog box

{button Concepts,AL('Debugging Your Program;Source\_Window\_F1',0,'')} {button See Also,AL('Find\_dialog\_F1;Goto\_Function\_F1;Goto\_Line\_Window\_F1',0,'')}

### Search ► Bookmarks

Use the Bookmarks dialog box to view or edit bookmarks. Bookmarks are specific to the text in which the bookmark was dropped. Adding text above the bookmark pushes the line number of the bookmark automatically.

The bookmark list shows the locations of the ten bookmarks, by file, line, and column. Click an entry to select it; double-click to go to it.

Button	Description
Go to	Moves the insertion point to the selected bookmark. You can also double-click the bookmark in the list.
Clear	Clears the current (highlighted) bookmark.
Drop	Sets the selected bookmark to the current insertion point. The entry in the bookmark list is updated to show the file, line, and column.

## Using the Find in Files dialog box

{button See Also,AL('Find\_dialog\_F1',0,'')}

### File ► Find in Files

The Source Editor's global find feature provides a powerful means of locating a string in any set of files.

To start a search, click Find. When the search is finished, Visual Cafe displays the results in the search results window. You can double-click a file to open it.

The result window's pop-up menu allows you to perform another search, go to the selected file source, add the selected item to the project, or add all files that matched the criteria to the project.

**Tasks**

[Specifying the name and location of the files to be searched](#) (Name & Location tab)

[Setting advanced search criteria](#) (Advanced tab)

## Specifying the search files and location

```
{button See Also,AL('Find_in_Files_dialog_F1;Setting_Advanced_Search_Criteria_howto',0,','')}
```

You can specify the search criteria, the type of files to search, and the files location on the Name & Location tab of the Find in Files dialog box.

1. Select the appropriate search criteria options at the bottom of the window.

<u>To</u>	<u>Do</u>
Search using regular expressions	Choose what you want to search for from the pop-up menu of regular expressions. This option is the default.
Search with wildcard symbols	Select the Match Wildcards option.
Search with exact case matching	Select the Match case option.
Search for an exact match to a whole word	Select the Match whole word only option. This option limits matches to files that contain the search criteria string preceded and followed by a space, tab, or punctuation character, or search string that starts or ends a line.

2. Specify the search pattern in the Find what field. The drop-down list displays the previous sixteen search strings. If Regular expression is selected, you can use the more button ▶ to select [valid regular expression characters](#).
3. Specify the types of files to search by entering file extensions or selecting extensions from the drop-down list.
4. Select the scope of the search. You can specify a folder, the current project, or the last set of files found in a previous search.

<u>To</u>	<u>Do</u>
Expand a search into subfolders	Select the Search subfolders option.

## Setting advanced search criteria

```
{button See Also,AL('Find_in_Files_dialog_F1',0,','')}
```

You specify file attribute and modification search criteria from the Find in Files dialog box's Advanced tab.

1. Set attribute criteria by enabling the appropriate attribute options. This narrows the search scope.

File attributes are **Archive**, **Read Only**, **System**, and **Hidden**.

**Note** The Attributes check boxes are three-state check boxes. If an attribute is checked, then files with the given attribute are searched. If an attribute is cleared, then files without the given attribute are searched. If an attribute is grayed, the attribute is ignored when Visual Cafe decides which files to search.

2. Specify modification criteria by enabling the Files created or modified option.

Set the appropriate values in the Date and Time fields. The field value "ignore" disables the associated data or time field.

**Date:** Select Ignore to ignore the date. Otherwise, specify a date and one of the options. For instance, specify "Is" and 11/6/94 to search files last modified on November 6, 1994, or "Greater" and 4/1/90 to search files last modified after April 1, 1990.

**Time:** Select Ignore to ignore the time. Otherwise, specify a time and one of the options.

## Using the Compare Files dialog box

{button See Also,AL('Find\_dialog\_F1;Find\_in\_Files\_dialog\_F1;Replace\_dialog\_F1',0,';')}

### Search ▶ Compare Files

The Compare Files dialog box provides the ability to compare two text files line-by-line. Upon completion of the comparison, the two files display in separate windows where you can scroll through the lines that are different.

1. Select the file to be used as the base text -- File 1.

If either file is currently open, Visual Cafe uses the version that is in memory, rather than reading the file from the disk. If you want to pinpoint recent changes, first save the open file under a different name, then compare it to the file on the disk.

**Tip** Click the down-arrow to show a drop-down list box containing the names of files recently compared. Click the browse button to display an open file dialog box for file selection.

2. Select the file that is mapped against file 1 -- File 2.
3. Specify the line number that the search should start from in both files. These numbers can be different.
4. Specify the arrangement of the source windows that display the results.

Visual Cafe then performs the comparison on a line-by-line basis.

Option	Description
Horizontal	Displays one window above the other.
Vertical	Displays one window next to the other.

When the Source Editor finds a mismatch, the editor highlights the lines in both files and reports where the mismatch was found. Click Next Match to re-synchronize the comparison. The Source Editor then highlights the next set of matching lines and the Compare dialog box reports where the match occurs. Click Next Difference to find the next mismatched line. You can continue the comparison until no more differences are found.

## Editing a File



## Selecting text

{button See

Also,AL(`Visual\_Caf\_Tools\_for\_Working\_with\_Classes\_and\_Components;Source\_Window\_F1;Customizing\_Editing\_windows\_Editing\_tab\_F1;Defining\_auto\_filetype\_formatting\_F1\_howto',0,',';')}

You can select text in any of these standard ways:

- Clicking and dragging the mouse
- Shift-clicking
- ALT-clicking

ALT+click+drag performs a column select.



## Toggle overtype and insert typing modes

```
{button How To,AL('Defining_auto_filetype_formatting_F1_howto',0,'')} {button See  
Also,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components;Source_Window_F1;Customizing_Editing_windows_E  
diting_tab_F1',0,'')}
```

Source windows support two typing modes: overtype, which replaces characters as you type; and insert, which adds new characters to the file.

### To toggle the typing mode

- Press the INSERT key to toggle between overtype and insert modes.

The typing mode is displayed in the status bar.

**Note** A change in typing mode applies to all open Source windows, not just to the active window.



## Indenting code automatically

```
{button How To,AL('Defining_auto_filetype_formatting_F1_howto',0,'')} {button See  
Also,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components;Source_Window_F1;Customizing_Editing_windows_E  
diting_tab_F1;Format_Options_Dialog_F1',0,'')}
```

By default, the Source Editor automatically indents a new line to the same depth as the previous line. You can set several indentation options, such as automatic indentation, tab width, and indent/unindent after braces, from the format options.

### To set format options for a file

- Choose Source ▶ Format Options.

### To set format options for the environment

- Choose Tools ▶ Environment Options
- ▶ Format.





## Wrapping lines of code

{button See

```
Also,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components;Source_Window_F1;Customizing_Editing_windows_E  
diting_tab_F1;Defining_auto_filetype_formatting_F1_howto;Format_Options_Dialog_F1',0,';')
```

Because the editor is designed for source files, word wrap is not enabled by default. You must press the ENTER key to start a new line. When you type past the right edge of the window, the text scrolls horizontally. You can enable word wrap and set a right margin either locally or globally using the text format options.

### To set format options for a file

- Choose Source ▶ Format Options.

### To set format options for the environment

- Choose Tools ▶ Environment Options
- ▶ Format.

## Classes

## Finding a class or class definition

```
{button Concepts.AL('Projects_overview;Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See Also.AL('Source_Window_F1;Class_Browser_using_F1;Hierarchy_Editor_F1;Files_Tab_F1;Adding_Code_to_a_Java_Source_File_howto;Viewing_Imports_Hierarchy_Editor_howto;Class_Display_in_Class_Browser_howto;Deleting_a_Class_Inheritance_howto;Deleting_a_class_howto;Renaming_a_class_howto;Copying_a_class_howto;Insert_class_dialog_F1;Editing_a_class_howto;Adding_a_class_howto',0,','')}
```

You can locate classes in the Source window, Class Browser, Hierarchy Editor, and Project window, and view class definitions.

### To search from the Source window or pane

- While the Source window is active or while your cursor is in the Source pane of the Class Browser, choose Search ► Find to look in the current file.
- Choose Search ► Find in Files to look in multiple files.

#### ► [Details on this task](#)

### To locate a class in the Class Browser

- Click in the Classes pane, then type the class name. For example, to locate java.awt.FlowLayout, type **fl**. Press TAB to go to the next entry with that letter sequence.

As you type, selections are made to match the text you enter. As you continue typing, the search is refined.

The class you are searching for is highlighted.

#### Note

- In the Class Browser, the search is conducted by package and only expanded packages are searched. So if you want to locate a class in a particular package, you need to expand the package by clicking the +, then start typing. If you want to exclude a package from a search, then collapse the package (click the -).
- If the class you want is not displayed in the pane, you might need to change what classes are displayed by choosing Classes ► Options. See [Controlling class display in the Class Browser](#) for more information.

### To locate a class in the Hierarchy Editor

- While the Hierarchy Editor is the active window, type the class name. For example, to locate java.awt.FlowLayout, type **fl**.

As you type, selections are made to match the text you enter. As you continue typing, the search is refined.

The class you are searching for is highlighted.

**Note** If the class you want is not displayed, you might have to enable viewing imports. While the Hierarchy Editor is the active window, choose Hierarchy ► View Imports or right-click and choose View Imports to toggle the display.

### To go to a class definition from the Source window or pane

Perform these steps from a Source window or the Source pane of the Class Browser.

1. Select or click in a class, then choose Search ► Go to Definition, or right-click and choose Go to Definition.
2. If a Members window displays, select the member you want to view.

A Class Browser window appears.

#### ► [Details on using the Class Browser](#)

### To go to a class definition from the Class Browser

You can view source code in the Source pane of the Class Browser or in a Source window. The Source pane has the same editing options as the Source window.

- To display source code in the Source pane, select a class in the Classes pane then a member in the Members pane.
- To display source code in a Source window, from the Classes pane, select a class then choose Classes ► Go to Source, or right-click a class and choose Go to Source.

#### ► [Details on using the Source window](#)

### To go to a class definition from the Hierarchy Editor

- To view a class in the Source window, select a class then choose Hierarchy ► Go to Source, or right-click a class and choose Go to Source.
- To view a class in the Class Browser, double-click a class in the Hierarchy Editor.

### To go to a class definition from the Project window

- Double-click a class in the Packages or Files view.
- Select a class in the Packages or Files view, then choose Object ► Edit Source, or right-click and choose Edit Source.





## Adding a new class

```
{button Concepts,AL(`Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL(`Class_Browser_using_F1;Source_Window_F1;Hierarchy_Editor_F1;Projects_overview;Adding_Code_to_a_Java_Sour  
ce_File_howto;Viewing_Imports_Hierarchy_Editor_howto;Class_Display_in_Class_Browser_howto;Deleting_a_Class_Inheritanc  
e_howto;Deleting_a_class_howto;Renaming_a_class_howto;Copying_a_class_howto;Insert_class_dialog_F1;Editing_a_class_h  
owto;Finding_a_class_howto',0,','')}
```

The Class Wizard makes creating new Java classes and interfaces easier and more foolproof by setting up a complete prototype for you. You can also add classes manually.

### To add a new class with the Class Wizard

- Launch the Class Wizard from the Insert menu, Class Browser, or Hierarchy Editor.



#### [Details on using the Class Wizard](#)

### To manually add a new class from the Source window

- Type the Java code that creates a class.

### To add a class from the Project window

- Adding a [top-level component](#) to the Project window (Objects view) creates a new class and Java source file.



## Editing a class

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL('Class_Browser_using_F1;Source_Window_F1;Hierarchy_Editor_F1;Projects_overview;Adding_Code_to_a_Java_Sour  
ce_File_howto;Viewing_Imports_Hierarchy_Editor_howto;Class_Display_in_Class_Browser_howto;Deleting_a_Class_Inheritanc  
e_howto;Deleting_a_class_howto;Renaming_a_class_howto;Copying_a_class_howto;Insert_class_dialog_F1;Adding_a_class_  
howto;Finding_a_class_howto',0,','')}
```

The Class Wizard makes editing Java classes and interfaces easier and more foolproof. You can also edit classes manually.

### To edit a class with the Class Wizard

- Launch the Class Wizard from the Class Browser or Hierarchy Editor.



[Details on using the Class Wizard](#)

### To manually edit a class in the Source window

- Find the class and edit the Java code.

### To manually edit a class from the Class Browser

- Select a class in the Classes pane then a member in the Members pane, and edit the class in the bottom Source pane.

### To change the inheritance hierarchy from the Hierarchy Editor

- To change the inheritance hierarchy, click the line between a parent and base class, then drag the line by its anchor to another base class.

## Using the Class Wizard

```
{button Concepts.AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also.AL('Class_Browser_using_F1;Source_Window_F1;Hierarchy_Editor_F1;Projects_overview;Adding_Code_to_a_Java_Sour  
ce_File_howto;Viewing_Imports_Hierarchy_Editor_howto;Class_Display_in_Class_Browser_howto;Deleting_a_Class_Inheritanc  
e_howto;Deleting_a_class_howto;Renaming_a_class_howto;Copying_a_class_howto;Editing_a_class_howto;Adding_a_class_h  
owto;Finding_a_class_howto',0,','')}
```

The Class Wizard makes creating new Java classes and interfaces easier and more foolproof by setting up a complete prototype for you. You can also edit existing classes.

1. To define a new class or interface with the Class Wizard, do one of the following:
  - Choose Insert ► Class.
  - Select a class or interface in the Classes pane of the Class Browser, then right-click and choose Insert Class.
  - Select a class or interface in the Hierarchy Editor, then right-click and choose Insert Class.
  - Select a class or interface in the Hierarchy Editor, then drag a line from it.
  - By default in the Environment Options, you can press INSERT from the Class Browser or Hierarchy Editor.

If you select a class, that class becomes the default class to inherit from.

To edit a class or interface with the Class Wizard, do one of the following:

- Select a class or interface in the Classes pane of the Class Browser, then choose Classes ► Edit Class, or right-click and choose Edit Class.
  - Select a class or interface in the Hierarchy Editor, then right-click and choose Edit Class.
2. On the first page of the wizard, specify the options you need:

Option	Description
Type	Select Class if you are creating a <a href="#">class</a> or Interface if you are creating an <a href="#">interface</a> .
Name	Type the name of the class or interface.
Source	Type the complete path to the Java file. Click the Edit button to browse. In the Edit Class File dialog box, you can specify the package and Java file name, and the file path is displayed for you.
Package	Choose a <a href="#">package</a> to add the class or interface to, or None to not add it to an existing package.
Extends	If you are defining a class, choose a class to extend from.
Access	Select whether you want to make access to your class through Package, Public, Private, or Protected. Public is available only if the class name and file name are the same; Protected and Private are for <a href="#">inner classes</a> only.
Final or Abstract	Select Final class or <a href="#">Abstract class</a> .

3. Click Finish if you are finished with the definition, or continue by clicking Next.

The next page of the wizard appears, where you can choose the interfaces to implement.
4. From the Available interfaces list, select the interfaces you want to implement and click the downward-pointing arrow.

To move an interface from the lower list box to the upper one, select the interface and click the upward-pointing arrow.
5. Click Finish if you are finished with the definition, or continue by clicking Next.

The next page of the wizard appears, where you can choose the [methods](#) to override. Required methods already appear in the Override these methods list box.
6. From the Available methods list, select the methods you want to override and click the downward-pointing arrow.

To move a method from the lower list box to the upper one, select the method and click the upward-pointing arrow. You cannot move methods that are required.
7. If you want to review or change part of the definition, click Back.

You can go back to previous pages of the wizard.

8. Click Finish when you are finished with the definition.

The new class is inserted in the active project.

9. Complete the definition of the class or interface in the Source window or Class Browser.

- ▶ [Details on using the Source window](#)
- ▶ [Details on using the Class Browser](#)



## ▶ Copying or moving a class

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL('Class_Browser_using_F1;Source_Window_F1;Hierarchy_Editor_F1;Projects_overview;Adding_Code_to_a_Java_Sour  
ce_File_howto;Viewing_Imports_Hierarchy_Editor_howto;Class_Display_in_Class_Browser_howto;Deleting_a_Class_Inheritanc  
e_howto;Deleting_a_class_howto;Renaming_a_class_howto;Insert_class_dialog_F1;Editing_a_class_howto;Adding_a_class_ho  
wto;Finding_a_class_howto',0,','')}
```

You can use menu commands or drag-and-drop to copy or move classes. You can copy and move text within the same window, or between Source Editor windows, including the Source window and the Class Browser Source pane. The Source pane is at the bottom of the Class Browser.

- Select code, then choose Edit ▶ Cut or Copy, or right-click and choose Cut or Copy.
- Position the cursor where you want to paste, then choose Edit ▶ Paste, or right-click and choose Paste.
- Drag a block of selected text to move it.
- Press CONTROL while dragging a block of selected text to copy the text. (A + appears over the cursor when a copy operation is being performed.)

## Renaming a class

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL('Class_Browser_using_F1;Source_Window_F1;Hierarchy_Editor_F1;Projects_overview;Adding_Code_to_a_Java_Sour  
ce_File_howto;Viewing_Imports_Hierarchy_Editor_howto;Class_Display_in_Class_Browser_howto;Deleting_a_Class_Inheritanc  
e_howto;Deleting_a_class_howto;Copying_a_class_howto;Insert_class_dialog_F1;Editing_a_class_howto;Adding_a_class_how  
to;Finding_a_class_howto',0,','')}
```

The Class Wizard makes creating new Java classes and interfaces easier and more foolproof by setting up a complete prototype for you. You can also edit existing classes.

### To rename a class with the Class Wizard

- Launch the Class Wizard from the Class Browser or Hierarchy Editor.

#### ▶ [Details on using the Class Wizard](#)

### To rename a class in the Project window

- Renaming a [top-level component](#) in the Project window (Objects view) changes the class name, constructor, and all references in the source file.

### To rename a class in the Source window

- Find the class and rename it, then search for its name and rename all occurrences.

### To rename a class in the Class Browser

1. Select the class in the Classes pane. Then click the class again.
2. When an edit box appears, type the new name or edit the existing name.

The constructor is renamed for you.



## Deleting a class

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,'')} {button See  
Also,AL('Class_Browser_using_F1;Source_Window_F1;Hierarchy_Editor_F1;Projects_overview;Adding_Code_to_a_Java_Sour  
ce_File_howto;Viewing_Imports_Hierarchy_Editor_howto;Class_Display_in_Class_Browser_howto;Deleting_a_Class_Inheritanc  
e_howto;Renaming_a_class_howto;Copying_a_class_howto;Insert_class_dialog_F1;Editing_a_class_howto;Adding_a_class_ho  
wto;Finding_a_class_howto',0,'')}
```

You can delete a class from the Source window.

- Select the code, then press DELETE or choose Edit ► Delete.

## Changing a class inheritance

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL('Insert_class_dialog_F1;Adding_Code_to_a_Java_Source_File_howto;Viewing_Imports_Hierarchy_Editor_howto;Class  
_Display_in_Class_Browser_howto;Deleting_a_class_howto;Renaming_a_class_howto;Copying_a_class_howto;Insert_class_di  
alog_F1;Editing_a_class_howto;Adding_a_class_howto;Finding_a_class_howto;Hierarchy_Editor_F1',0,','')}
```

You can quickly change or delete the inheritance relationship between a class and its parent in the Hierarchy Editor and Class Browser.

### To change the inheritance hierarchy in the Hierarchy Editor

- Click the line between two classes, then drag the line by its anchor to another class.

The class on the right now derives from the class you connected it to. This changes its source code.

### To delete a class inheritance from the Hierarchy Editor

- Select the line that links a class and the class it derives from.
- Right-click the window to display the pop-up menu.
- Choose Delete Inheritance.

The class now inherits directly from `java.lang.Object`.

### To delete a class inheritance from the Class Browser

- In the Classes pane, choose Classes ▶ Options, or right-click and choose Options.
- In the Group/Sort tab, specify a Class Grouping of Hierarchically, then click OK.

When you are showing classes by a Hierarchical view and a class implements one or more interfaces, it displays below each interface.

- In the Classes pane, select a class, then press DELETE.

If you delete a class that is specified below an interface, that interface is deleted from the class. If you delete a class below a class, the class now inherits directly from `java.lang.Object`.

## ▶ Controlling class display in the Class Browser

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL('Insert_class_dialog_F1;Adding_Code_to_a_Java_Source_File_howto;;Viewing_Imports_Hierarchy_Editor_howto;Delet  
ing_a_Class_Inheritance_howto;Deleting_a_class_howto;Renaming_a_class_howto;Copying_a_class_howto;Insert_class_dialo  
g_F1;Editing_a_class_howto;Adding_a_class_howto;Finding_a_class_howto;Hierarchy_Editor_F1',0,','')}
```

You can control how classes display in the Classes pane.

1. In the Classes pane, choose Classes ▶ Options, or right-click and choose Options.
2. In the Class Options dialog box, set the options you want:
  - In the Group/Sort tab, specify whether you want to group classes alphabetically, hierarchically, or by package.
  - In the Filter tab, specify whether you want to show imported classes.



## Viewing imports in the Hierarchy Editor

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL('Insert_class_dialog_F1;Adding_Code_to_a_Java_Source_File_howto;Class_Display_in_Class_Browser_howto;Deletin  
g_a_Class_Inheritance_howto;Deleting_a_class_howto;Renaming_a_class_howto;Copying_a_class_howto;Insert_class_dialog  
_F1;Editing_a_class_howto;Adding_a_class_howto;Finding_a_class_howto;Hierarchy_Editor_F1',0,','')}
```

You can enable and disable viewing imports in the Hierarchy Editor.

- While the Hierarchy Editor is the active window, choose Hierarchy ► View Imports or right-click and choose View Imports to toggle the display.

## ▶ Controlling which classes and members display

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL('WinStyle_Controlling_Inherit_Method_Display_F1;WinStyle_Grouping_and_Sorting_Class_and_Members_F1;Adding_  
Code_to_a_Java_Source_File_howto;Class_Browser_using_F1',0,','')}
```

### **Class Options ▶ Filter tab**

Use this tab to enable filtering of classes and members. This filtering results in a refined display in the Classes and Member panes of the Class Browser.

#### **Show these members**

Defines the type of members to display in the Member pane. Options include [access type](#) and method types. There must be at least one option selected in each group.

#### **Show member types**

Select this options to include the method's arguments in the listing.

#### **Show imported classes**

This is the single option for classes. Clearing this option prevents imported classes from displaying in the Class and Member panes.

#### **Final, Static, Regular**

These are Java method types. Refer to your Java documentation for more information.



## Grouping and sorting classes and members

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL('WinStyle_Controlling_Class_and_Member_Display_F1;WinStyle_Controlling_Inherit_Method_Display_F1;Adding_Cod  
e_to_a_Java_Source_File_howto;Class_Browser_using_F1',0,','')}
```

### Class Options ▶ Group/Sort tab

Use this tab to change the ordering of classes and member elements in the Class Browser.

#### Group Classes

Specify how the classes in the Classes pane are to be grouped.

#### Sort Members

Specify how the members in the Members pane are to be sorted in their group. Grouping of members is controlled with Group Members. The None option sorts the elements based on the order in which they were created.

#### Group Members

Defines the grouping of members in the Member pane. The By Kind option groups the elements as Methods or Data. The By Access option groups the elements by their [access type](#).



## Members

## Finding a method or data variable

```
{button Concepts,AL('Projects_overview;Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,'')} {button See  
Also,AL('Source_Window_F1;Class_Browser_using_F1;Hierarchy_Editor_F1;Files_Tab_F1;Adding_Code_to_a_Java_Source_F  
ile_howto;Member_Display_in_Class_Browser_howto;Deleting_a_member_howto;Renaming_a_member_howto;Copying_a_me  
mber_howto;Editing_a_member_howto;Adding_methods_ClassBrowser_howto',0,'')}
```

You can quickly locate methods (including [event handlers](#)) and data variables in the Source window and Class Browser, and view their definitions.

### To go to a method in the Source window

1. In the Objects drop-down list of the Source window, choose an object.
2. In the Events/Methods drop-down list, choose the event or method.

Existing events and methods are shown in bold. If you choose an event or method that is not bold, it is created for you.

**Note** Only top-level components have methods in the Events/Methods list.

### To go to a member definition from the Source window or pane

Perform these steps from a Source window or the Source pane of the Class Browser.

1. Select or click a member, then choose Search ► Go to Definition, or right-click and choose Go to Definition.
2. If a Members window displays, select the member you want to view.

A Class Browser window appears.

#### ► [Details on using the Class Browser](#)

### To search from the Source window or pane

- While the Source window is active or while your cursor is in the Source pane of the Class Browser, choose Search ► Find to look in the current file.
- Choose Search ► Find in Files to look in multiple files.

#### ► [Details on this task](#)

### To locate a method or data variable in the Class Browser

1. Select a class in the Classes pane.

#### ► [Details on this step](#)

2. Click in the Members pane, then type the method or data variable name. For example, to locate the CENTER data variable for the FlowLayout class, type **cen**. Press TAB to go to the next entry with that letter sequence.

The method or data variable you are searching for is highlighted. The source code is displayed in the Source pane.

Each member has a color-coded icon to indicate its access privileges (green is public, yellow is protected, blue is package, and red is private).

**Note** If the method or data variable you want is not displayed in the pane, you might need to change what members are displayed by choosing Classes ► Options. See [Controlling member display in the Class Browser](#) for more information.

## Adding a method or data variable

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL('Source_Window_F1;Class_Browser_using_F1;Hierarchy_Editor_F1;Adding_methods_ClassBrowser_howto;Binding_C  
ode_to_a_Form_Component_howto;Binding_Code_to_a_Menu_Command_howto;Adding_Code_to_a_Java_Source_File_howt  
o;Member_Display_in_Class_Browser_howto;Deleting_a_member_howto;Renaming_a_member_howto;Copying_a_member_h  
owto;Editing_a_member_howto;Finding_a_member_howto',0,','')}
```

You can conveniently add members from the Class Browser and Source window.

### To create a new member from the Class Browser

1. In the Class pane, select the class you want to add a method or data variable to.

#### ► Details on this step

2. Right-click in the Members pane and choose Insert Member. Or while the Class Browser is the active window, choose Insert ► Member.

By default in the Environment Options, you can also press INSERT.

The Insert Member dialog box appears.

3. Type the declaration and choose the access type, then click OK.

For example, `int myVar ()` is a valid declaration you could type. The member appears in the Members pane.

4. Select the member in the Members pane to view and edit source code in the Source pane.

**Note** If the method or data variable you want is not displayed in the pane, you might need to change what members are displayed by choosing Classes ► Options. See [Controlling member display in the Class Browser](#) for more information.

### To add an event handler from the Source window

[Event handlers](#) and other source code can be added in the Source window. Visual Cafe changes the source code in four ways when you add an event handler from the Source window:

- First, Visual Cafe generates an [adapter](#) or [listener](#) implementation for the event. If one was already generated, it is used with the new interaction.
- Second, in the adapter/listener class, Visual Cafe generates a check for the object requesting the handling of the event and a call to the event handler.
- Third, Visual Cafe instantiates this adapter/listener class and generates the registration (specifically, `object.addtypeListener` or `object.addtypeAdapter`) after the comment tag REGISTER\_LISTENERS. If the adapter/listener class has already been instantiated, it is used.
- Fourth, an event handler is generated. If the event handler already exists, it is used.

If instead you use the Interaction Wizard to create an [interaction](#), Visual Cafe makes the four modifications mentioned previously, plus the interaction specified in the wizard is generated in the event handler. See [Using the Interaction Wizard](#) for more information.

To add an event handler from the Source window:

1. In the Objects drop-down list of the Source window, choose an object.
2. In the Events/Methods drop-down list, choose the event or method.  
Existing events and methods are shown in bold. If you choose an event or method that is not bold, it is created for you.
3. In the event handler, replace the placeholder text `// to do: code goes here` with appropriate Java code.

### To manually add a new member from the Source window

- Type the Java code to add the member.

## ▶ Editing a method or data variable

```
{button Concepts.AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also.AL('Class_Browser_using_F1;Source_Window_F1;Hierarchy_Editor_F1;Projects_overview;Adding_Code_to_a_Java_Sour  
ce_File_howto;Member_Display_in_Class_Browser_howto;Deleting_a_member_howto;Renaming_a_member_howto;Copying_  
a_member_howto;Adding_methods_ClassBrowser_howto;Finding_a_member_howto',0,','')}
```

You can conveniently edit members from the Class Browser and Source window.

### To view or edit the source code of a member

You can view source code in the Source pane of the Class Browser or in a Source window. The Source pane has the same editing options as the Source window.

- To display source code in the Source pane, select a class in the Classes pane then a member in the Members pane.  
**Note** If the class or member you want is not displayed in the pane, you might need to change what classes and members are displayed by choosing Classes ▶ Options. See [Controlling member display in the Class Browser](#) for more information.
- To display source code in a Source window, from the Classes pane, select a class then choose Classes ▶ Go to Source, or right-click a class and choose Go to Source.

#### ▶ [Details on using the Source window](#)

### To view attributes of a member from the Class Browser

1. In the Class pane, select the class that contains the member.

#### ▶ [Details on this step](#)

2. Select the member in the Members pane.

**Note** If the method or data variable you want is not displayed in the pane, you might need to change what members are displayed by choosing Classes ▶ Options. See [Controlling member display in the Class Browser](#) for more information.

3. Right-click in the Members pane and choose Member Attributes. Or while the Class Browser is the active window, choose Classes ▶ Member Attributes.

The Member Attributes dialog box displays.

4. Change the access type if needed, then click OK.

### To edit a member in the Source window

- Find the member and edit the Java code.

#### ▶ [Details on finding a member](#)

## ▶ Copying or moving a method or data variable

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL('Class_Browser_using_F1;Source_Window_F1;Hierarchy_Editor_F1;Projects_overview;Adding_Code_to_a_Java_Sour  
ce_File_howto;Member_Display_in_Class_Browser_howto;Deleting_a_member_howto;Renaming_a_member_howto;Editing_a_  
member_howto;Adding_methods_ClassBrowser_howto;Finding_a_member_howto',0,','')}
```

You can use menu commands or drag-and-drop to copy or move members. You can copy and move text within the same window, or between Source Editor windows, including the Source window and the Class Browser Source pane. The Source pane is at the bottom of the Class Browser.

- Select code, then choose Edit ▶ Cut or Copy, or right-click and choose Cut or Copy.
- Position the cursor where you want to paste, then choose Edit ▶ Paste, or right-click and choose Paste.
- Drag a block of selected text to move it.
- Press CONTROL while dragging a block of selected text to copy the text. (A + appears over the cursor when a copy operation is being performed.)



## Renaming a method or data variable

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL('Class_Browser_using_F1;Source_Window_F1;Hierarchy_Editor_F1;Projects_overview;Adding_Code_to_a_Java_Sour  
ce_File_howto;Member_Display_in_Class_Browser_howto;Deleting_a_member_howto;Copying_a_member_howto;Editing_a_m  
ember_howto;Adding_methods_ClassBrowser_howto;Finding_a_member_howto',0,','')}
```

You can conveniently rename members from the Class Browser and Source window.

### To rename a member in the Class Browser

1. Select a class in the Classes pane, then the member in the Members pane. Click the member again.



[Details on finding a class](#)



[Details on finding a member](#)

2. When an edit box appears, type the new name or edit the existing name.

### To rename a member in the Source window

- Find the member and rename it, then search for its name and rename all occurrences.



[Details on finding a member](#)



## Deleting a method or data variable

```
{button Concepts.AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also.AL('Class_Browser_using_F1;Source_Window_F1;Hierarchy_Editor_F1;Projects_overview;Adding_Code_to_a_Java_Sour  
ce_File_howto;Member_Display_in_Class_Browser_howto;Renaming_a_member_howto;Copying_a_member_howto;Editing_a_  
member_howto;Adding_methods_ClassBrowser_howto;Finding_a_member_howto',0,','')}
```

You can delete a member from the Class Browser or Source window.

**Note** Deleting an [event-handler](#) is the same as deleting an [interaction](#). See [Using the Interaction Wizard](#) for more information.

### To delete a member from the Class Browser

1. In the Class pane, select a class that contains the member.



#### Details on this step

2. Select a member or shift-click multiple members in the Members pane.

**Note** If the method or data variable you want is not displayed in the pane, you might need to change what members are displayed by choosing **Classes ▶ Options**. See [Controlling member display in the Class Browser](#) for more information.

3. Right-click in the Members pane and choose **Delete Member**. Or while the Class Browser is the active window, choose **Classes ▶ Delete Member**.

The member is deleted from the class.

**Note** You get a deletion confirmation dialog box only if it is enabled in the Environment Options. See [Specifying code editing options](#) for more information.

### To delete a member from the Source window

- Select the code, then press **DELETE** or choose **Edit ▶ Delete**.

## Controlling member display in the Class Browser

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL('Insert_class_dialog_F1;Adding_Code_to_a_Java_Source_File_howto;Class_Browser_using_F1;Deleting_a_member_  
howto;Renaming_a_member_howto;Copying_a_member_howto;Editing_a_member_howto;Adding_methods_ClassBrowser_ho  
wto;Finding_a_member_howto',0,','')}
```

You can control how members display in the Members pane.

1. In the Members pane, right-click and choose Options. Or while the Class Browser is the active window, choose Classes ► Options.
2. In the Class Options dialog box, set the options you want:
  - In the Group/Sort tab, specify whether you want to sort members by access (public, private, protected, and package), alphabetically, or not at all.
  - In the Group/Sort tab, specify whether you want to group members by kind or by access.
  - In the Filter tab, specify what members you want to show (choose from public, private, protected, package, final, static, and regular) and if you want to display their types.
  - In the Inheritance tab, specify whether you want to show inherited methods, and if so, if you want to display full method names or show overridden methods.





## Controlling the display of inherited methods

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,'')} {button See  
Also,AL('WinStyle_Controlling_Class_and_Member_Display_F1;WinStyle_Grouping_and_Sorting_Class_and_Members_F1;Ad  
ding_Code_to_a_Java_Source_File_howto;Class_Browser_using_F1',0,'')}
```

### **Class Options ▶ Inheritance tab**

Use this option to toggle the display of inherited methods in the Class Browser's Members pane.

#### **Show inherited methods**

Toggles the display and activates two suboptions.

#### **Use full method names**

Selecting this option adds the method's package and class name to the method names in the listing.

#### **Show overridden methods**

Adds methods that are overridden by methods in the class to the Member listing.

## Events

## Adding an event handler to a component

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,'')} {button See  
Also,AL('Class_Browser_using_F1;Source_Window_F1;Hierarchy_Editor_F1;Binding_Code_to_a_Form_Component_howto;Bin  
ding_Code_to_a_Menu_Command_howto;Adding_Code_to_a_Java_Source_File_howto;Editing_Event_Methods_howto;Deletin  
g_an_Event_Handler_howto;Listener_Accessing_Outside_howto;Migrating_10_to_11_event_model_howto',0,'')}
```

[Event-handler](#) code is automatically added when you add an event to a [component](#).

Visual Cafe changes the source code in four ways when you add an event handler from the Source window:

- First, Visual Cafe generates an [adapter](#) or [listener](#) implementation for the event. If one was already generated, it is used with the new interaction.
- Second, in the adapter/listener class, Visual Cafe generates a check for the object requesting the handling of the event and a call to the event handler.
- Third, Visual Cafe instantiates this adapter/listener class and generates the registration (specifically, `object.addtypeListener` or `object.addtypeAdapter`) after the comment tag REGISTER\_LISTENERS. If the adapter/listener class has already been instantiated, it is used.
- Fourth, an event handler is generated. If the event handler already exists, it is used.

If instead you use the Interaction Wizard to create an [interaction](#), Visual Cafe makes the four modifications mentioned previously, plus the interaction specified in the wizard is generated in the event handler. See [Using the Interaction Wizard](#) for more information.

To add an event handler from the Source window:

1. In the Objects drop-down list of the Source window, choose a component.
2. In the Events/Methods drop-down list, choose the event or method.  
Existing events and methods are shown in bold. If you choose an event or method that is not bold, it is created for you.
3. In the event handler, replace the placeholder text `// to do: code goes here` with appropriate Java code.



## Editing an event handler

```
{button Concepts,AL(^Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL(^Class_Browser_using_F1;Source_Window_F1;Hierarchy_Editor_F1;Visual_Caf_Tools_for_Working_with_Classes_and  
_Components;Adding_Code_to_a_Java_Source_File_howto;Adding_an_Event_to_Component_howto;Deleting_an_Event_Han  
dler_howto;Listener_Accessing_Outside_howto;Migrating_10_to_11_event_model_howto',0,','')}
```

You can conveniently edit [event handlers](#) from the Class Browser and Source window.

### To edit an event handler from the Class Browser

- Select a class in the Classes pane then a member in the Members pane, and edit the member in the bottom Source pane.



[Details on finding a class](#)



[Details on finding a member](#)

### To edit an event handler in the Source window

1. In the Objects drop-down list of the Source window, choose an object.
2. In the Events/Methods drop-down list, choose the event or method.

Existing events and methods are shown in bold. If you choose an event or method that is not bold, it is created for you.

3. Edit the Java code.



## Deleting an event handler

{button Concepts,AL(`Visual\_Caf\_Tools\_for\_Working\_with\_Classes\_and\_Components',0,','')} {button See Also,AL(`Class\_Browser\_using\_F1;Source\_Window\_F1;Hierarchy\_Editor\_F1;Binding\_Code\_to\_a\_Form\_Component\_howto;Binding\_Code\_to\_a\_Menu\_Command\_howto;Adding\_Code\_to\_a\_Java\_Source\_File\_howto;Adding\_an\_Event\_to\_Component\_howto;Editing\_Event\_Methods\_howto;Listener\_Accessing\_Outside\_howto;Migrating\_10\_to\_11\_event\_model\_howto',0,','')}

Deleting an [event-handler](#) is the same as deleting an [interaction](#). See [Using the Interaction Wizard](#) for more information.

## Migrating a Java file from the 1.0 to 1.1 event model

```
{button Concepts.AL(^Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also.AL(^Class_Browser_using_F1;Source_Window_F1;Hierarchy_Editor_F1;Binding_Code_to_a_Form_Component_howto;Bin  
ding_Code_to_a_Menu_Command_howto;Migration_howto;Adding_Code_to_a_Java_Source_File_howto;Adding_an_Event_to  
_Component_howto;Editing_Event_Methods_howto;Deleting_an_Event_Handler_howto;Listener_Accessing_Outside_howto',0,  
','')}
```

Visual Cafe has a command that automatically converts a Java source file from the 1.0 event model to the 1.1 event model.

**Note** If you add a Visual Cafe version 1.0 Java file to a Visual Cafe version 2.0 project without first opening its 1.0 project, the Java file will not be set up to use the new Visual Cafe components (specifically, the INIT portion of the code). You should first open the 1.0 project in the newer version of Visual Cafe so that the file is updated for you.

1. Open the file in the Source window.
2. Choose Project ► Migrate.

Visual Cafe parses the `handleEvent` and action methods. From these methods, new code is generated to handle the events in the 1.1 event model. This includes generating the required [adapters](#) and [listeners](#), and registering the listeners. For menus with menuitems created as quoted literals, such as `menu1.add("Open")`, a `MenuItem` object is created to support the new event model.

The comment tag `//{{INIT_CONTROLS` is generated by Visual Cafe to mark the location where components are created and initialized. The comment tag `//{{REGISTER_LISTENERS` marks the location where listeners are registered.

3. Look over your code and make modifications as needed. For example, you might have code that you need to move from the `handleEvent` and action methods.

## Accessing a listener from outside an init method or application constructor

```
{button Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL('Binding_Code_to_a_Form_Component_howto;Binding_Code_to_a_Menu_Command_howto;Migration_howto;Adding_  
Code_to_a_Java_Source_File_howto;Migrating_10_to_11_event_model_howto',0,','')}
```

If you want to use `removeActionListener` or `addActionListener` within another method, you need to create code to allow access to the implemented [listener](#) from any part of the class file.

After Visual Cafe creates a listener in your Java source code, you will find the comment tag `//{{REGISTER_LISTENERS,` followed by the instance of a listener. For example, in an `init` method for an applet with a button action listener, you would see the following code:

```
//{{REGISTER_LISTENERS  
SymAction lSymAction = new SymAction();  
button1.addActionListener(lSymAction);  
//}}
```

The `lSymAction` listener is not accessible outside of the `init` method. To get access, you should create a global reference to this instance.

To do this, after the close of the register listeners code block (`//}}`), add the following line of code:

```
glSymAction = lSymAction;
```

Then locate the comment tag `//{{DECLARE_CONTROLS` in the body of the class. After the end of this code block (`//}}`), add the following line:

```
SymAction glSymAction;
```

Now you will have access to the implemented listener from any part of the class file by using the `glSymAction` variable.

## Obsolete Topics



## Understanding basic object-oriented programming concepts

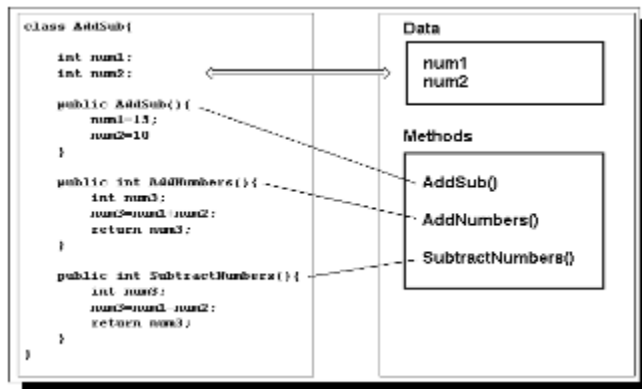
{button How

To,AL(^adding\_methods\_to\_a\_class\_howto;adding\_methods\_classbrowser\_howto;Adding\_methods\_ClassBrowser\_howto;Insert\_class\_dialog\_F1;adding\_a\_subclass\_from\_the\_class\_browser\_howto;adding\_a\_subclass\_from\_the\_hierarchy\_editor\_howto;inserting\_a\_custom\_class\_howto',0,'')} {button See

Also,AL(^Form\_Designer\_F1;Object\_Library\_F1;Differences\_between\_Applets\_and\_Applications;Using\_Visual\_Caf\_as\_Your\_Development\_Environment;Working\_Visually\_with\_Visual\_Caf;Working\_with\_Basic\_User\_Interface\_Components',0,''))

Much like DNA determines the structure of a living object, classes determine the way [objects](#) look and behave. Classes contain source code, which includes instructions for object creation or [instantiation](#).

A class contains the code to define a collection of data variables and [methods](#). The following diagram illustrates what the code for a class looks like:



*The AddSub class definition*

This is the code for a simple class called `AddSub`. Note that the `AddSub` class listed above is not a complete Java program that you can run. A Java program has a **main** method or [extends](#) `java.applet.Applet`. Classes containing a **main** method or extending the `Applet` class can be compiled into programs. Other classes, like `AddSub`, are only a class definition. They simply specify a class name and define what [data](#) and methods the class contains.

In this example, the `AddSub` class has two variables as its data: the integers `num1` and `num2`. The `AddSub` class also has three methods: `AddSub`, `AddNumbers`, and `SubtractNumbers`. The first method defines the [constructor method](#) because it has the same name as the class, `AddSub`. The other two methods are called `AddNumbers`, and `SubtractNumbers`. These two methods change the data and return a result.

Once a class has been defined and compiled, it can be included in your Java programs. Note the following:

- A Java source file (with a **java** extension) can contain more than one class.
- When a source file is compiled, one or more class files (with a **class** extension) are generated — one class file per class.

<<The rest down looks wrong. Needs to be fixed.>>

However, to use any of the data or methods defined in a class, you must write a program that creates components based on the class. The process of creating a component based on a class definition is called creating an instance of a class.

You can access the source for a class component by double-clicking the source file in the Packages view of the Project window. Like forms, when you open the component, the primary editor is invoked. In the case of class files, the primary editor is the Source Editor, which is a text editor.

When you add a [top-level component](#) to your [project](#), a Java source file is generated in your project. This Java source file contains the form [declaration](#) and, when components are added to the form, [components](#).

### Understanding components

When you want to make use of the code in a class definition, you need to create an instance of that class. An instance of a class is a variable that contains references to all the data and methods of the class on which it is based. Just as an `int` variable is based on the type integer, instances of a class store the data and can access the methods of the class on which it was based.

A class is a blueprint that defines basic data and methods of an object. The class definition is used to define templates of

components that can be instantiated and then used in your programs. You can create multiple instances of the same class just as you can create multiple variables of the type `int`. Once you have created a component, that component contains its own data and provides the methods to access that data. You can use an instance of a class as a starting place for your own component design. You can also add to or redefine existing methods and variables.

For example, suppose you want to write a program that draws a rectangle. First you must think about the characteristics of the rectangle component you want to model. Some [properties](#) of a rectangle are width and height. A behavior of a rectangle is that it can be drawn.

The data for this component could be two integer variables to hold the width and the height, and a method to draw the rectangle.

Defining the data and methods together in a component or class encapsulates the properties and behaviors into a single unit. Once the code for the rectangle has been created, you or anyone else can reuse it whenever you want. [Encapsulation](#) and [reusability](#) are two of the most beneficial characteristics of an object-oriented programming language.

When you work with components in an object-oriented programming language, you work with the features of that component to make it behave a certain way, or to interact with other components.

[Sorting classes](#)



## Using the Classes Pane

```
{button How To,AL('WinStyle_Grouping_and_Sorting_Class_and_Members_F1',0,'')} {button See  
Also,AL('Source_Window_F1;Class_Browser_using_F1;Popup_menu_Class_Pane_F1',0,'')}
```

The Classes pane of the Class Browser displays a list of your project's Java classes. This view also provides an outline in which subclasses display indented and below their parent. A class that implements multiple interfaces displays below each interface class.

You can change the ordering of the classes by using the Options command in the pop-up menu. This command opens the Class Options dialog box Group/Sort tab. By default, the classes appear alphabetically by name.

To add and define a class or interface, use the pop-up menu Insert Class command. This command is the same as Insert ► Class off the main menu.



## Using the Members Pane

```
{button How To,AL('WinStyle_Grouping_and_Sorting_Class_and_Members_F1',0,'')} {button See  
Also,AL('Source_Window_F1;Class_Browser_using_F1;Popup_menu_Member_Pane_F1',0,'')}
```

The Members pane of the Class Browser displays a list of methods and data elements in the selected class. Clicking a member causes its associated Java source code definition or declaration to display in the Source pane.

By default, the methods and data members display in two groups with each element sorted alphabetically within the group. Each element has a color-coded icon to indicate its access privileges (green = public, yellow = protected, blue = package, and red = private).

You can change the display of elements in the Members pane by using the Options command in the pop-up menu. This command opens the Class Options dialog box Group/Sort tab.



## Visually working with project classes

```
{button How To,AL('Class_Browser_using_F1;Hierarchy_Editor_F1',0,'')} {button  
Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,'')}
```

The Class Browser and Hierarchy Editor are Java class editors. These tools let you work with your source code in an object-oriented fashion, rather than in the traditional file-oriented manner.

The Class Browser and Hierarchy Editor can perform similar operations on classes and hierarchies; they differ mostly in their interface. The Class Browser's interface emphasizes member editing; the Hierarchy Editor's interface, through its graphical display, emphasizes inheritance relationships. You can use one or the other, or both simultaneously, according to your preference.

## Adding a class

```
{button
Concepts,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components;Visual_Caf_Tools_for_Working_with_Classes_and
d_Components;Working_with_the_Source_Editor',0,','')} {button See
Also,AL('Class_Browser_using_F1;Source_Window_F1;Hierarchy_Editor_F1;Projects_overview',0,','')}
```

The Insert Class Wizard makes creating new Java classes and interfaces easier and more foolproof by setting up a complete prototype for you.

1. To define a new class with the Insert **<<Create?>>** Class Wizard, do one of the following:
  - Choose Insert ► Class.
  - Select a class in the Classes pane of the Class Browser, then right-click and choose Insert Class.
  - Select a class in the Hierarchy Editor, then right-click and choose Insert Class. **<<Are you going to implement this?>>**
  - Select a class in the Project window (Packages or Files tab), then right-click and choose Insert Class. **<<Are you going to implement this?>>**

If you select a class, that class becomes the default class to inherit from.

2. On the first page of the wizard, specify the options you need:

Option	Description
Type	Select Class if you are creating a <a href="#">class</a> or Interface if you are creating an <a href="#">interface</a> .
Name	Type the name of the class or interface.
Source	Type the complete path to the class file. <b>&lt;&lt;I don't get the Edit Class File dialog box.&gt;&gt;</b>
Package	Choose a <a href="#">package</a> to add the class or interface to, or None to not add it to an existing package.
Extends	If you are defining a class, choose a class to extend from.
Access	Select whether you want to make access to your class through Package, or Public, Private, or Protected. <b>&lt;&lt;Is this working right?&gt;&gt;</b>
Final or Abstract	Select Final class or <a href="#">Abstract class</a> .

3. Click Finish if you are finished with the definition, or continue by clicking Next.

The next page of the wizard appears, where you can choose the interfaces to implement. Required interfaces already appear in the Implement these interfaces list box.
4. From the Available interfaces list, select the interfaces you want to implement and click the downward-pointing arrow.

To move an interface from the lower list box to the upper one, select the interface and click the upward-pointing arrow. You cannot move interfaces that are required.
5. Click Finish if you are finished with the definition, or continue by clicking Next.

The next page of the wizard appears, where you can choose the [methods](#) to override. Required methods already appear in the Override these methods list box.
6. From the Available methods list, select the methods you want to override and click the downward-pointing arrow.

To move a method from the lower list box to the upper one, select the method and click the upward-pointing arrow. You cannot move methods that are required.
7. If you want to review or change part of the definition, click Back.

You can go back to previous pages of the wizard
8. Click Finish when you are finished with the definition.

The new class is inserted in the active project.
9. Complete the definition of the class or interface in the Source window or Class Browser.

► [Details on using the Source window](#)

► [Details on using the Class Browser](#)



## Adding a subclass from the Class Browser

{button See

Also,AL(^Adding\_a\_subclass\_from\_the\_Hierarchy\_Editor\_howto;Adding\_a\_Subclass\_from\_the\_Project\_window\_howto',0,';')}}}

As an alternative to using the Insert menu, you can add a class within the Class Browser.

1. Select a class as the base class of the your new class.
2. Right-click in the Classes pane to display the pop-up menu.
3. Select the command Insert Class
4. Complete the Insert Class wizard.

▶ [Details on this step](#)

The new class name appears in classes pane. The source pane shows the class declaration.

**Note** To delete a class, select the class and press DELETE.



## Adding a subclass from the Hierarchy Editor

{button See

```
Also,AL(^Adding_a_subclass_from_the_Class_Browser_howto;Adding_a_Subclass_from_the_Project_window_howto',0,'')
```

As an alternative to using the Insert menu, you can add a class within the Hierarchy Editor.

1. Select the parent/base class.
2. Drag the selection and release it in any whitespace of the window background.
3. Complete the Insert Class wizard.

▶ [Details on this step](#)





## Adding a subclass from the Project window

{button See  
Also,AL(^Adding\_a\_subclass\_from\_the\_Class\_Browser\_howto;Adding\_a\_Subclass\_from\_the\_Hierarchy\_Editor\_howto',0,','')}

To add classes to an existing package from within the Project window:

1. In the Project window, click the Packages tab.
  2. Select the package to which you want to add the class.
  3. Choose Insert ▶ Class.
  4. Complete the Insert Class wizard.
- ▶ [Details on this step](#)

## Working with the Source Editor

```
{button How To,AL('Customizing_Editing_windows_Editing_tab_F1',0,'')} {button See  
Also,AL('Form_Designer_F1;Projects_overview;Overview_of_Visual_Caf;Object_Library_F1',0,'')}
```

The Visual Cafe Source window is where you can create, display, and edit code. It is a full-featured text editor with many options and features particularly useful when editing Java source code. It provides for full Java [syntax](#) highlighting and flexible navigation tools. The Source Window also plays an important role in [debugging](#) your project. You can use the Source Window for monitoring program execution while debugging, and for setting breakpoints at design time.

Source windows are tied to individual [components](#) and [class](#) files. All methods in a single component are displayed in one Source window. The active component and a complete list of its [events](#) are displayed next to the source pane. If the event has not yet been bound to an [event handler](#), selecting an event name creates an event handler for that event. Events that have been bound to an event handler appear in bold text. When you select a bound event, the event handler associated with that event name is displayed in the Source window text box.



## Viewing a component's Java source

```
{button  
Concepts,AL('Adding_Code_to_a_Java_Source_File_howto;Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,  
'')} {button See  
Also,AL('Source_Editor_F1;Binding_Code_to_a_Form_Component_howto;Binding_Code_to_a_Menu_Command_howto',0,'')}
```

You can open a component's Java source file to enhance the component behavior with custom Java code.

1. In the Form Designer, double-click the component.  
**or**  
Select the component in the Source window or Form Designer, then choose Edit Source from the pop-up menu.
2. In the Source window, add your custom code to the file.



## Moving around in a file

{button See

```
Also,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components;Source_Window_F1;Customizing_Editing_windows_Editing_tab_F1;Defining_auto_filetype_formatting_F1_howto;Format_Options_Dialog_F1;Goto_Line_Window_F1;Goto_Function_F1',0,';')
```

You can move the insertion point in a file by using the mouse or keyboard in the standard Windows text-editing manner. In addition, you can jump to specific points in a file using commands from the Search menu.

The following are common tasks that you do while editing. Other "Go To" functionality is available on the Search menu.

### Jumping to a matching delimiter

A common problem in source code is parentheses (`()`), brackets (`[]`), and braces (`{}`) that don't match. To find the other half of a pair of these delimiters, position the insertion point in front of one of the delimiters and choose Search ► Go to Matching Delimiter. The insertion point moves to the other half of the pair.

Delimiter checking can also be done automatically using the source format options. The Source Editor looks for any parenthesis, bracket, or brace, including text in strings and comments.

### Jumping to a specific line

To jump to a specific line, choose Search ► Go To Line. The Go To Line dialog box opens. Type the line number in the text box and click OK. The editor moves the insertion point to the beginning of the specified line.

### Jumping to a function

To jump to a specific function, choose Search ► Go to Function. The Go to Function dialog box opens. You can select a function name from the scrolling list or type in a function name. The insertion point then moves to the beginning of the specified function.



## Searching through and comparing multiple files

```
{button How To,AL('Find_in_Files_dialog_F1;Compare_Files_Dialog_F1',0,','')} {button See  
Also,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components;Source_Window_F1;Customizing_Editing_windows_E  
diting_tab_F1;Defining_auto_filetype_formatting_F1_howto',0,','')}
```

The global find feature of the Source Editor provides a powerful means of locating a string in any set of files.

### To search for a string in multiple files

- Choose Search ► Find in Files. You can choose to search:
  - All source files in the current project
  - All files listed in the Search window (which opens after the first search)
  - All files matching the criteria you specify, including filename, directory, date, time, and file attributes

### To compare two files

- Choose Search ► Compare Files.



## Using the Class Attributes dialog box

```
{button Concepts,AL('Class_Browser_using_F1',0,','')} {button See Also,AL('Insert_class_dialog_F1',0,','')}
```

**Classes ▶ Class Attributes  
Hierarchy**

### ▶ Class Attributes

Use this dialog box to change the attributes for the selected class.

You can change the class name and its base class.

<< Opens the Edit Class Wizard, where you can change the definition of a class or interface???>>



## Adding a method from the Source window

```
{button Concepts,AL(`Source_Window_F1;Adding_Code_to_a_Java_Source_File_howto',0,'')} {button See  
Also,AL(`Adding_methods_ClassBrowser_howto;Binding_Code_to_a_Form_Component_howto;Binding_Code_to_a_Menu_Co  
mmand_howto',0,'')}
```

[Event handlers](#) and other source code can be added directly in the Source window:

1. Open the Source window for the form.
2. In the Source window, select an event handler from the Events/Methods drop-down list.  
The appropriate event handler logic is added automatically to the source code.
3. Replace the placeholder text `// to do: place event handler code here` with appropriate Java code.
4. Save the file.



## Adding a method to a class

```
{button Concepts,AL('Adding_Code_to_a_Java_Source_File_howto',0,','')} {button See  
Also,AL('Binding_Code_to_a_Form_Component_howto;Binding_Code_to_a_Menu_Command_howto',0,','')}
```

You can add methods to a component from the Class Browser or Source window.

[Adding a method from the Class Browser](#)

[Adding a method from the Source window](#) Adding\_methods\_SourceEditor\_howto



## ▶ **Editing source code**

```
{button How  
To,AL('Adding_Code_to_a_Java_Source_File_howto;Adding_Files_to_a_Project_howto;Adding_methods_to_a_class_howto',0,  
'')} {button See Also,AL('Debugging Your Program;Source_Menu_F1;Source_Window_F1',0,'')}
```

The purpose of the Visual Cafe Source Editor is to create, examine, and modify your project's source files. Because these files are standard text files, you can, in principle, use any Source Editor to work with them. The Source Editor is designed to work in concert with other Visual Cafe tools.

The Visual Cafe Source window and the Class Browser Source pane both share the same editing functionality. The editor uses standard Windows editing commands and has special features that make working with Java files easier. For example, the editor can automatically indent or unindent after braces and can check delimiters.

In addition, the Source Editor can display keywords, preprocessor directives, and comments in special font styles and colors. This technique helps track errors in source code while you are editing. For example, an unmatched comment (`/*` without a matching `*/`) turns a large part of the code a different color, making it obvious where the problem lies. Also, keywords and preprocessor directives are easier to spot when they are in a different color or font style. Misspelled keywords can be caught immediately when they remain displayed in the default font.

Source windows are an integral part of the Visual Cafe environment and work together with other Visual Cafe windows to make application development easier. For example, Visual Cafe automatically saves all files open in Source windows when you rebuild your project. During compilation, error messages are displayed in the Messages window; when you double-click an error message, Visual Cafe opens a Source window on the corresponding source file, if necessary, and then jumps to the line in the source code that caused the error.

The Source Editor supplies standard Windows functions for cutting, copying, pasting, and deleting text. These functions can be accessed through either the Edit menu or the pop-up menu.

▶ [Click here for guidelines on adding custom code](#)

## Enhancing Java code for a component

{button See

```
Also,AL('Insert_class_dialog_F1;Adding_Code_to_a_Java_Source_File_howto;Adding_methods_to_a_class_howto;Binding_Code_to_a_Form_Component_howto;Binding_Code_to_a_Menu_Command_howto',0,',';')}
```

With Visual Cafe's extensive [Component Library](#), you can create many applets and applications without writing any Java code. However, there may be specific behaviors that require [custom code](#) to be added to the Visual Cafe source file.

You may want to add or modify Java code for a [component](#) to:

- add event behavior
- perform exception handling
- implement runtime security for applications
- extend a method

Before you add custom code, you should create your project and use Visual Cafe's powerful visual tools to create your forms. You can add components to your project, arrange components in the Form Designer, modify the look of individual components with the Property List, and add interactions between components or a component and itself with the Interaction Wizard. It is a good idea to do as much as you can with the Visual Cafe tools before you add your custom code.

When you are visually satisfied with your project, you can then add any necessary code enhancements using the Source window or Class Browser.

**Caution** Visual Cafe only maintains the code that it automatically generates. This means that when you add code to an component and later delete the component from the form or project, only the automatically generated code is removed during the component deletion. You must edit the appropriate Java source files to remove your own code references.

{button ,JI('VCAFE.HLP', 'Adding\_Code\_to\_a\_Java\_Source\_File\_howto')} [Click here for more guidelines](#)

## Dragging-and-dropping in the Source window

```
{button How To,AL('Projects_overview;Source_Window_F1',0,',';'')}
```

You can use standard graphical user interface (GUI) techniques for dragging and dropping objects into and among other objects.

<<Any drag/drop capabilities for Class Browser or Hierarchy Editor? I assume the source pane has the same drag/drop characteristics as the Source window. Also, is the table below complete?>>

<u>Dragging</u>	<u>Into</u>	<u>Effect</u>
Code in the Source window	Windows operating system	Creates a <b>src</b> file containing the selected code. <<This doesn't appear to work.>>
Code in a Source window	Event prototype in a Source window	Moves just the event code into the new event. Press CONTROL to copy. <<True? Better explanation?>>
Event or method item	Source window	Inserts Java code that calls the event and enters the method name in the new event prototype. <<True?>> Press CONTROL to copy.

## Intro/Marketing - Overview Section

## Welcome to Visual Cafe

```
{button How  
To,AL('Applets_step_overview;Applications_step_overview;Applications_native_step_overview;Applications_native_console_ste  
p_overview;DLLs_native_step_overview;Creating_beans_overview',0,'')} {button See  
Also,AL('Overview_of_Visual_Caf;Working_Visually;Visual_Caf_as_a_Development_Environment;The_Differences_between_A  
pplets_and_Applications;GUI_development_with_Visual_Caf;Visual_Cafe_Tools_overview;How_is_my_Work_Kept_In_Sync_ov  
erview;How_WYSIWYG_is_Visual_Cafe_overview;Workspace_customization_overview;Creating_native_overview;Native_librari  
es_and_DLLs_overview',0,'')}
```

Symantec Visual Cafe is a visual Rapid Application Development (RAD) tool designed exclusively for the Java programming language. Visual Cafe is a complete form-centric development environment that provides the tools and components necessary to develop, debug, and deploy high-performance Web applets and stand-alone Java applications.

Visual Cafe provides you with a rich set of What-You-See-Is-What-You-Get (WYSIWYG) tools that you use to assemble and debug your applets and applications.

Visual Cafe comes in a Web Development Edition, Professional Development Edition, and Database Development Edition. If a feature applies to the Professional edition, but not the Web edition, it is noted; for example "(Professional edition)." Professional edition features also are included in the Database edition.

## What's new in version 2.5

```
{button How  
To,AL('Applets_step_overview;Applications_step_overview;Applications_native_step_overview;Applications_native_console_ste  
p_overview;DLLs_native_step_overview;Creating_beans_overview',0,'')} {button See  
Also,AL('Overview_of_Visual_Caf;Working_Visually;Visual_Caf_as_a_Development_Environment;The_Differences_between_A  
pplets_and_Applications;GUI_development_with_Visual_Caf;Visual_Cafe_Tools_overview;How_is_my_Work_Kept_In_Sync_ov  
erview;How_WYSIWYG_is_Visual_Cafe_overview;Workspace_customization_overview;Creating_native_overview;Native_librari  
es_and_DLLs_overview',0,'')}
```

You can learn about some new features in the Visual Cafe Professional Development Edition by looking at these new or revised help topics:

- [Choosing the SDI or MDI development environment](#)
- [Using the MDI development environment](#)
- [Enabling and disabling RAD and automatic code generation](#)
- [Adding code to a Java source file](#)
- [Sorting files in the Files view](#)
- [Using Visual Cafe version 2.1 menus](#)
- [Using JFC Swing components](#)
- [Creating a JAR file by using the JAR Packager](#)
- [Creating a JAR file by using AutoJAR](#)
- [Specifying JAR options in the Bundler.properties file](#)
- [Mapping Visual Cafe commands to key sequences](#)
- [Visual Cafe Open APIs](#)

For more complete information, consult your What's New documentation.

## Overview of Visual Cafe

```
{button How  
To,AL(^ Applets_step_overview;Applications_step_overview;Applications_native_step_overview;Applications_native_console_ste  
p_overview;DLLs_native_step_overview;Creating_beans_overview',0,'')} {button See  
Also,AL(^ Java_HTML_and_Visual_Caf;Projects_overview;The_Differences_between_Applets_and_Applications;Understanding_  
Visual_Components;Working_Visually;The_Development_Life_Cycle_A_Two_Step_Process',0,'')}
```

Symantec Visual Cafe is a complete Rapid Application Development (RAD) environment for Java. It provides an easy-to-use and seamlessly integrated visual development environment featuring a complete professional toolset. Visual Cafe allows you to create and debug Web-hosted Java applets, stand-alone Java applications, and libraries.

Featuring a sophisticated set of high level, [two-way tools](#), Visual Cafe is a leading Java development environment:

- The form-centric development environment has a powerful integrated form design tool.
- A configurable widget toolbar contains your favorite form components.
- The Component Library contains a repository of components for form development.
- Add-in third party components are easily made available through the extensible Component Library.
- The Interaction Wizard allows you to specify actions based on [events](#).
- Form and property list modifications generate real-time source code.
- A debugging window incorporates a tree view to collapse and expand the various scopes.

The Symantec Java compiler that comes with Visual Cafe was written specifically for the Java language. Instead of typing a string of commands at a command prompt, you click a single icon to compile and execute a program. Visual Cafe provides useful, meaningful messages indicating how the compiling process is progressing.

In addition, Visual Cafe provides many Windows-based development tools not found in the JDK. Visual Cafe's graphical development environment makes Java programming easier and faster.

## Visual Cafe tools

```
{button How To,AL('Applets_step_overview;Applications_step_overview;Applications_native_step_overview;Applications_native_console_step_overview;DLLs_native_step_overview;Creating_beans_overview',0,'')} {button See Also,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components;Visual_Cafe_window_F1;Projects_overview;Form_Designer_F1;Palette_F1;Using_the_Menu_Editor_F1;Using_the_Interaction_Wizard_F1;Property_Inspector_using_F1;Source_Window_F1;Object_Library_F1;Class_Browser_using_F1;Hierarchy_Editor_F1;Debugging;Understanding_the_Visual_Caf_Debugger;The_Debugging_Workspace_and_Tools;Debugging_Applets_and_Applications',0,'')}
```

Visual Cafe provides several tools to help you create [forms](#). With Visual Cafe, you can add visual [components](#) to your forms to quickly assemble [applets](#) and [applications](#).

Each visual component has a set of properties, a [visual element](#), a set of methods and associated Java code, and may have one or more [interactions](#) and [events](#).

The main Visual Cafe tools are:

- Visual Cafe window
- Project window
- Form Designer
- Source window
- Class Browser
- Debugger
- Component Palette
- Component Library
- Property List
- Menu Designer
- Interaction Wizard
- Hierarchy Editor

## Understanding workspaces

```
{button How To,AL('workspaces_aud_howto',0,'')} {button See Also,AL('Form_Designer_F1;Projects_overview;Overview_of_Visual_Caf;Differences_between_Applets_and_Applications;Understanding_Visual_Components;Using_Visual_Caf_as_Your_Development_Environment;Working_with_Basic_User_Interface_Components',0,'')}
```

Workspaces provide a convenient way to switch from one screen layout to another. Workspaces are task-oriented, as opposed to project-oriented; you create workspaces for different tasks, such as editing or debugging.

A workspace is a saved arrangement of windows. Because the various tools in Visual Cafe are displayed in many individual windows, workspaces are used to group together the windows that have related functions. Workspaces provide a means of organizing the multiple windows of the development environment into logical groups. For example, when you edit source code you could use a workspace that displays the text editor, the Messages window, and the Project window. When you are debugging your program, you could use another workspace that displays windows for the different debugging tools.

Visual Cafe supports the extended mouse functions of the Windows 95 interface. Right-clicking on various components of the windows opens context-sensitive pop-up menus. As you work with Visual Cafe, try right-clicking on the different parts of the screen. You may discover some useful shortcuts!



## Visual Cafe Open APIs

```
{button How  
To,AL('Applets_step_overview;Applications_step_overview;Applications_native_step_overview;Applications_native_console_ste  
p_overview;DLLs_native_step_overview;Creating_beans_overview',0,'')} {button See  
Also,AL('Visual_Caf_Tools_for_Working_with_Classes_and_Components;Projects_overview;Form_Designer_F1;Palette_F1;Usi  
ng_the_Menu_Editor_F1;Using_the_Interaction_Wizard_F1;Property_Inspector_using_F1;Source_Window_F1;Object_Library_  
F1;Class_Browser_using_F1;Hierarchy_Editor_F1;Debugging;Understanding_the_Visual_Caf_Debugger;The_Debugging_Work  
space_and_Tools;Debugging_Applets_and_Applications',0,'')}
```

Symantec Open APIs offer a broad range of functionality. In general, the Open APIs are designed to give third-party vendors flexible ways to integrate their tools into Visual Cafe for Java without imposing any unnecessary restrictions. For technologies requiring a native interface, third parties can use any C, C++, or Pascal environment to implement the integration. Here are some features of the Open APIs:

- The Project Templates API offers vendors the ability to register and add new project templates to Visual Cafe for Java, and supports both dynamic (interactive wizard) and static project-template creation.
- The Source Code Manipulation and Integration API provides a way for third-party software developers to ensure that interactive source code changes can be made with Visual Cafe, allowing for live integration with source code editing and modeling tools. Vendors can use this API to add their own classes and components to Visual Cafe for Java and ensure that when a user is working with advanced tools changes made in the source code are reflected across all files.
- The Symantec BeanInfo Extension APIs provide visual development environments with information missing from the BeanInfo specification for the placement and attributes of JavaBeans within a development environment, and to provide code generation between objects within that environment.
- The Menu Hooks API provides a way to add menu items to the Visual Cafe for Java menu bar.
- The Project Windows Extension API lets vendors add columns to a Project Window, notify owners or users of specific events, and customize the Project window with their own contextual help messages.
- The CASE API enables third parties to receive notification of project-level events, query, and set component property values, thus seamlessly integrating developers' use of CASE tools with Visual Cafe for Java.
- The Version Control API allows for vendor implementation of their version control system's user interface into Visual Cafe, allowing end users to install and work with multiple version-control systems on a per-project basis.
- The Data Binding API helps third-party component developers provide their users with a way to develop the exchange between Java UIs and databases without editing code, and offers a convenient way to bind visual components to databases.

See the Open API documentation for more information. (Currently, the latest revision of this documentation is available at <http://cafe.symantec.com/>.)



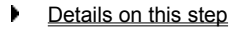
## Assembling applets

```
{button  
Concepts,AL('Using_Visual_Caf_as_Your_Development_Environment;The_Differences_between_Applets_and_Applications',0,'  
,')} {button See Also,AL('Object_Library_F1',0,'',')}
```

An applet can add dynamic, interactive functionality to your Web page. Visual Cafe makes it easy for you to develop an applet. You can follow these basic steps:

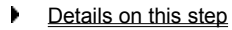
1. Create a new project.

To get started quickly, you can use the Basic Applet project template.



[Details on this step](#)

2. Design the user interface.



[Details on this step](#)

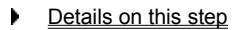
3. Enhance Java source code.



[Details on this step](#)

4. Set project options.

If you started with the Basic Applet project template, you probably do not need to set project options.



[Details on this step](#)

5. Run the applet in Visual Cafe.



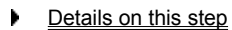
[Details on this step](#)

6. Debug the applet, if needed.



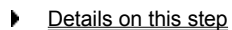
[Details on this step](#)

7. Add the applet to your HTML page.



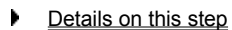
[Details on this step](#)

8. Run the applet in the HTML page.



[Details on this step](#)

9. Deploy the applet.



[Details on this step](#)



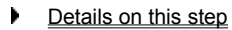
## Assembling applications

```
{button  
Concepts,AL('Using_Visual_Caf_as_Your_Development_Environment;The_Differences_between_Applets_and_Applications',0,'  
,')} {button See Also,AL('Object_Library_F1',0,'')} }
```

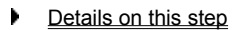
Visual Cafe provides powerful tools for assembling an application quickly. In general, the development cycle is made of these basic steps:

1. Create a new project.

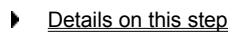
To get started quickly, you can use the Basic Application project template.



2. Design the user interface.

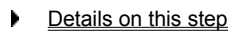


3. Enhance Java source code.



4. Set project options.

If you started with the Basic Application project template, you probably do not need to set project options.



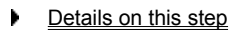
5. Test run the application in Visual Cafe.



6. Debug the application, if needed.



7. Deploy the application.



## Obsolete

The Symantec Java compiler that comes with Visual Cafe was written specifically for the Java language. Instead of typing a string of commands at the command prompt, you click a single icon to compile and execute a program.

Visual Cafe displays information in the Windows environment instead of at the DOS command line. Visual Cafe also provides useful, meaningful messages indicating how the compiling process is progressing.

In addition, Visual Cafe provides many Windows-based development tools not found in the JDK. Visual Cafe's graphical development environment makes Java programming easier and faster.

### **Sun Microsystems' Java compiler and the JDK**

When Sun Microsystems developed Java, they also created a compiler to convert Java source code into [class](#) files. The Java compiler developed by Sun is called `javac.exe` and is run from a DOS command line. To compile a Java program, you need to run `javac.exe`, passing the name of the source file along with any other required parameters.

Sun's Java compiler also comes with the Java Developers Kit, or JDK. The JDK is a collection of tools to help compile, debug, and test Java programs. The JDK, like Sun's compiler, uses a command line interface.

## Working visually with Visual Cafe

```
{button How  
To,AL('customizing_your_enviro_appearance_display_tab_f1_howto;customizing_editing_windows_editing_tab_f1;environment_  
customization_overview';0,'')} {button See  
Also,AL('Projects_overview;Overview_of_Visual_Caf;Understanding_Visual_Components;Using_Visual_Caf_as_Your_Develop  
ment_Environment;The_Development_Life_Cycle_A_Two_Step_Process';0,'')}
```

You create cross-platform Java applets and applications by first designing the user-interface [components](#) and then using the various Visual Cafe tools to automate the process of deriving classes, creating interactions, coordinating text messages, and mapping functions to visual components and messages. You can do most of these tasks with the [Property List](#) by setting [properties](#) to define, refine, and control the appearance and behavior of your visual components.

Visual Cafe creates and updates the source code as you create the [layout](#). This feature of Visual Cafe allows you to concentrate on designing and allocating other resources for your applet or application. It is possible to design, develop, and build an [applet](#) or [application](#) without having to write a single line of source code.

The Visual Cafe tools help you find and fix problems, reference the rules of the Java language, and organize the entire process of creating Java [applets](#) and [applications](#). Visual Cafe facilitates these tasks by providing an Integrated Development and Debugging Environment (IDDE). In other words, it is a single application that provides tools for the creation and development of a computer program.

## Using Visual Cafe as your development environment

```
{button How  
To,AL('customizing_your_enviro_appearance_display_tab_f1_howto;customizing_editing_windows_editing_tab_f1;environment_  
customization_overview',0,','')} {button See  
Also,AL('Form_Designer_F1;Projects_overview;Overview_of_Visual_Caf;Differences_between_Applets_and_Applications;Unde  
rstanding_Visual_Components;Using_Visual_Caf_as_Your_Development_Environment;Working_Visually_with_Visual_Caf;The_  
Development_Life_Cycle_A_Two_Step_Process',0,','')}
```

When a development environment is said to be integrated, this means that the tools in the environment work together. For example, the compiler might find an error in the [source code](#). In addition to displaying the error, you can double-click the highlighted error so that Visual Cafe opens the source file in the source editor and jumps to the exact line in the source code where the error occurred. Creating programs is faster and easier using tools that work together.

A large part of [applet](#) and [application](#) development involves adding and arranging [components](#) on [forms](#) and applets. Visual Cafe provides tools to make designing forms a simple process.

What is a visual component in Visual Cafe? Any visual component, such as a form, applet, or button, has:

### **A set of properties**

Governs how components display and how they behave. Properties are accessible from the Property List.

### **A visual element**

Shown as an icon in the Project window, and directly editable by double-clicking and opening the component.

### **A set of event handlers**

Code associated with any number of its [event handlers](#) are accessible from the Source window.

### **One or more interactions**

When provided, Visual Cafe translates into code. Interactions are *not* an integral part of all components.

Each of these component attributes has its own editor, from the Form Designer to the Interaction Wizard, making it easy to manipulate visual components.

## The development life cycle: a two-step process

```
{button How To,AL('applets_step_overview;applications_step_overview;',0,'')} {button See  
Also,AL('projects_overview;Projects_overview;Overview_of_Visual_Caf;Differences_between_Applets_and_Applications;Using_  
Visual_Caf_as_Your_Development_Environment;Working_Visually_with_Visual_Caf,0,'')}
```

Developing a Visual Cafe [applet](#) or [application](#) happens in two stages: creating the program and developing it. In the first stage, you design, create, and implement the graphic user interface (GUI) your program will need. You also make a very simplistic arrangement of all the components needed for this program. The second stage is when you bring your project to life by adding and modifying source code, debugging, redesigning, and testing your project.

### Step one: creating your applet or application

When you start a new project in Visual Cafe, Visual Cafe creates the basic [project](#) files required for a Visual Cafe applet or application, including source files and the Visual Cafe project file. Visual Cafe then loads these project files, and you can immediately begin working on your project.

To begin working on the GUI of your applet or application, lay out the various components and controls by dragging them from the Component Palette onto the Form Designer.

When you save your work, Visual Cafe saves the whole project as a .vep file along with all the changes and other files you may have added to your project. The .vep file is very much like a file folder for storing all of your work.

### Step two: developing your applet or application

The process for developing an applet or application involves changing or adding source code if necessary, adjusting the properties in the [Property List](#), working with the Hierarchy Editor and Class Browser, then compiling, linking, testing, and debugging. These steps are iterative, meaning that they are repeated constantly throughout the standard software development process.

### Common tasks

Here are procedures that are common to developing both applets and applications.

The first step in developing your program is to create the [graphic user interface](#) (GUI) using the Form Designer. Then you draw the components that make up the interface onto the forms you create by dragging and dropping the visual components from the Component Palette.

Next, you set properties for the components you placed on the Form Designer. The Property List provides a dialog box for you to set properties for all the components on a form. The Property List is also where you specify the text for all labels.

Now you create [event handlers](#). Event handlers contain code that is executed when an event occurs, such as when a user clicks a mouse button or enters information through the keyboard. You can automatically create event handlers (in other words, bind events) from the Source window or the Interaction Wizard.

Finally, you either run the program directly, otherwise run it in the debugger to debug your application.

## The differences between applets and applications

```
{button How  
To,AL('converting_cafe_apps_to_vcave_howto;converting_an_applet_to_an_application_howto;Applications_step_overview;appl  
ets_step_overview;testing_an_applet_howto',0,','')} {button See  
Also,AL('Form_Designer_F1;Java_HTML_and_Visual_Caf;Projects_overview;Overview_of_Visual_Caf;Understanding_Visual_C  
omponents;Visual_Caf_as_a_Development_Environment;Working_Visually;The_Development_Life_Cycle_A_Two_Step_Proces  
s',0,','')}
```

Visual Cafe [applets](#) and [applications](#) are cross-platform Java programs that you design, develop, and build using the drag-and-drop features of the Windows operating system through Visual Cafe. The program code used to create applets and applications are fundamentally similar. Both applets and applications are created using the same basic programming concepts.

Because the Web browser is responsible for running an applet, program instructions for applets have a different organization than the instructions for applications.

### More about applets

Java applets, like all Java programs, are made of source code that is compiled into a [class](#) file. A reference to the .class file is placed in a Web page. The Web page is downloaded across the Internet using a Java-capable Web browser. As the [bytecode](#) contained in the .class file is read, the Web browser's Java interpreter converts the bytecode into machine specific instructions, executes the program, and displays it.

Another feature of applets is that when they are executed within a Java-capable browser, the applet adopts the look and feel of the client machine's operating system and native interface controls. This means that a Java applet will look and feel like it was written for the Macintosh when it runs in the Macintosh environment, Windows applets will have the Windows look to them, and UNIX applets will reflect the look of the various flavors of UNIX.

Applets, however, cannot read from or write to a user's local hard drive. To add this capability to your applet, Symantec has created the database solution **dbAnywhere**.

When you create an applet with Visual Cafe, you create a subclass of the class Applet in the java.applet package. This applet class enables your applet to work within a Web browser and to utilize the capabilities of the Abstract Window Toolkit. The AWT allows your applet to include user interface (UI) elements, to handle mouse and keyboard [events](#), and to display to the screen. Although your applet can utilize as many [classes](#) as it needs, the main applet class triggers the execution of the applet. Its signature is as follows:

```
public class myClass extends java.applet.Applet {  
    . . .  
}
```

Java requires that your applet subclass be declared as public. This is only true of the main applet class; all other classes may be declared public or private as needed.

### Applets: advantages and disadvantages

Java applets have a significant advantage over applications because the Web browser software handles many of the functions that are required to make the applet run.

Standalone applications have [overhead](#) that must be written to make the program run properly; a standalone program must be able to start and stop the program, perform memory management, and handle display functions. Although this requires additional programming work, applications do not depend on the presence of a Web browser, nor do they have limitations on the kind of operations they can perform.

Because the browser software provides this functionality for applets automatically, applets are an attractive type of Java program to work with.

### Applet limitations

Sun designed Java to restrict the kinds of operations applets can perform. Limitations are imposed on applets so that a destructive program from a remote computer cannot cause damage to your system. To prevent applets from being destructive, Java enforces the following limitations:

- Applets cannot read from or write to the file system of the computer viewing the applet. This prevents damage to files and the spread of viruses.
- Applets cannot run any programs (or parts of programs like [DLLs](#) or shared files) on the viewer's computer. This prevents an applet from calling destructive programs that do not have the limitations of the applet.
- Applets can only establish connections between the server computer where the applet is stored and the viewer's computer. This prevents the applet from connecting the viewer's computer to another server without the viewer's knowledge.



Java applications do not have these limitations and can be used to build fully functional software programs.

### More about applications

An application is a Java program that runs with a [Java Virtual Machine](#) (Java VM) or a Java-compatible browser that is installed on the client system. An application is not displayed on a Web page. Java applications can be built because the Java language includes useful features that are not found standard in other languages. For example, Java comes with existing libraries of program code that make networking and graphics operations easier than ever.

Java applications, unlike applets, can read from and write to the client machine's hard drive. Applications can create their own frames, title bars, and menus.

Since applications are Java programs that run on their own, applications can be as large or as small as you want or need them to be. The only class that is needed to run an application is the **main** method. When you run your compiled Java class with the Java interpreter in Visual Cafe, the **main** method is called first.

The signature for the **main** method looks like this:

```
public static void main(String args[]) { . . . }
```

The parts of this line of code have the following meanings.

The public keyword means that the method can be "seen" or used by other classes and [components](#). The main method of your application must be declared public for the application to run.

The keyword static means a storage class.

The keyword void tells the main method to not return anything.

The **main** method takes one [argument](#), which is an array of strings. This array is used for command-line arguments outside of Visual Cafe.

For example, the body of the **main** method contains all the code your application needs to start executing. This includes code for variable initialization or component [instantiation](#).

## Environment Options



## Development environment customization

{button See  
Also,AL(^Using\_Visual\_Caf\_as\_Your\_Development\_Environment;Visual\_Caf\_Tools\_for\_Working\_with\_Classes\_and\_Componen  
ts',0;','')}

You can customize the Visual Cafe development environment by:

[Setting environment options](#)

[Setting project options](#)

[Modifying workspaces](#)



## Visual Cafe workspaces

```
{button How To,AL('Workspaces_AUD_howto',0,'')} {button  
Concepts,AL('Understanding_Workspaces;The_Debugging_Workspace_and_Tools',0,'')}
```

A large number of views are available in the Visual Cafe environment. Visual Cafe lets you save a configuration of windows as a unique [workspace](#). A workspace provides a convenient way to switch from one screen layout view to another.

Workspaces are task-oriented. You create workspaces for different tasks, such as designing, editing, or debugging. You can then access the workspaces from the Workspace toolbar or from Window ► Workspaces.

Visual Cafe supplies you with two workspaces: Edit and Debug. The Debug workspace automatically loads when you run your application and opens necessary debugging windows. When the processing ends, the development environment returns to the Edit workspace.

You can create, delete, or rename workspaces. Only [global view](#) windows are saved in a workspace.

Workspaces can be loaded automatically while running a project and when you stop the project. They are saved dynamically. For example, if the Property List is open in the Edit workspace and you close that window while in the Edit workspace, the change is saved to the workspace. This feature ensures that as you run and stop your programs, the window state remains as you last left them.



## Modifying workspaces

```
{button Concepts,AL('Workspace_customization_overview;Understanding_Workspaces',0,'')} {button See  
Also,AL('Toolbars_workspace_F1',0,'')}
```

You can create, delete, and rename a [workspace](#) by using the Workspaces menu option. Visual Cafe automatically saves changes to a workspace configuration when you exit the workspace.

### To change to a different workspace

Use either of these methods:

- Choose Window ► Workspaces
- *Workspace-name*.
- From the Workspace toolbar, select the appropriate workspace name.

### To save your current Visual Cafe window arrangement as a new workspace

1. Configure the screen as you like by opening the windows you need and positioning and sizing them to suit your requirements.
  2. Choose Window ► Workspaces
- New.
3. In the New Workspace dialog box, type a new name.
  4. Click OK.
- Visual Cafe creates a new workspace and displays it in the toolbar Workspace field. The workspace is also added to the Workspace list.

### To rename a workspace

1. Choose Window ► Workspaces
- Rename.
2. In the Rename Workspace dialog box, type a new name.
  3. Click OK.
- Visual Cafe changes the workspace name and displays it in the toolbar Workspace field. The name also changes in the Workspace list.

### To delete a workspace

**Caution** Deleting a workspace immediately deletes the workspace named in the toolbar Workspace field.

**Note** You cannot delete the last remaining workspace.

- Choose Window ► Workspaces
- Delete.
- The workspace is deleted and the next workspace in the listing is activated.



## Setting environment options

```
{button  
Concepts,AL('Using_Visual_Caf_as_Your_Development_Environment;Visual_Caf_Tools_for_Working_with_Classes_and_Comp  
onents',0,','')} {button See Also,AL('Project_Options_dialog_F1',0,','')}
```

### Tools ► Environment Options

Visual Cafe allows you to set options that are global to all of your projects.

**Note** To customize a single project, use the Project Options dialog box.

### Tasks

[Setting environment options in the General tab](#)

[Setting debugging options for the environment](#)

[Specifying text formatting for Visual Cafe windows](#)

[Mapping Visual Cafe commands to key sequences](#)

[Customizing the font and color of Visual Cafe windows](#)

[Specifying backup and save options](#)

[Specifying code editing options](#)

[Using the Component Palette tab](#)



## Setting environment options in the General tab

```
{button  
Concepts,AL('Using_Visual_Caf_as_Your_Development_Environment;Visual_Caf_Tools_for_Working_with_Classes_and_Comp  
onents',0,','')} {button How  
To,AL('Defining_the_Help_File_Set_howto;Finding_Java_source_howto;Defining_Visual_Caf_s_Startup_Mode_howto;Specifying  
_the_File_Search_Path_F1;Setting_Environment_Variables_in_scini_howto',0,','')}
```

From the General tab of the Environment Options dialog box, you can specifying the following environment options:

[Defining the Visual Cafe startup mode](#)

[Finding Java source files](#)

[Defining the Help file set](#)

[Choosing the SDI or MDI window system for the development environment](#)

[Using Visual Cafe version 2.1 menus](#)

### To open the Environment Options, General view

- Choose Tools ▶ Environment Options
- ▶ General tab.



## Defining the Visual Cafe startup mode

```
{button Concepts,AL('Projects_overview',0,','')} {button See  
Also,AL('Creating_a_Project_howto;Environment_Options_Dialog_F1',0,','visual')}
```

The startup mode defines what processing you want done when you start a new Visual Cafe session.

1. Choose Tools ► Environment Options



General Tab.

2. In the On Startup area, select the appropriate option.

Select...	To specify this...
Create a new project	Open a new project each time Visual Cafe starts.
Open the last project	Open the project that was active the last time Visual Cafe exited; if there is none, a new project is created. (This is the default.)
Do nothing	Specify that no project opens and that you will select an appropriate action after Visual Cafe starts.



## Finding Java source files

```
{button  
Concepts,AL('Using_Visual_Caf_as_Your_Development_Environment;Visual_Caf_Tools_for_Working_with_Classes_and_Comp  
onents',0,','')} {button See  
Also,AL('Setting_General_Environment_Options_General_tab_F1;Specifying_the_File_Search_Path_F1;Setting_Environment_  
Variables_in_scini_howto;Environment_Options_Dialog_F1',0,','')}
```

You can specify the path to locate source files if they are not in the project directory. This setting is for the entire Visual Cafe environment.

**Note** You can set the source search path for a project from the Project Options dialog box, and for the entire environment with the **javainc** statement in the \VisualCafe\Bin\sc.ini file.

1. Choose Tools ► Environment Options



General tab.

2. In the **Look for source files in path** field, type the the path to locate source files if they are not in the project.

**Tip** If you add a plus sign (+) to the end of a path, Visual Cafe searches in that path and all subdirectories. For example, c:\myapps+ specifies that Visual Cafe searches in c:\myapps and all of its subdirectories.





## Defining the Help file set

```
{button Concepts,AL('Using_Visual_Caf_as_Your_Development_Environment',0,','')} {button See  
Also,AL('Setting_General_Environment_Options_General_tab_F1;Environment_Options_Dialog_F1;Workspaces_AUD_howto',0  
','')}
```

The Help file set is a group of WinHelp **hlp** and **cnt** files that Visual Cafe uses at runtime. They are available when you use F1 help from the Source window or pane.

1. Choose Tools ► Environment Options

► General tab.

2. In the Help Files field, enter the **hlp** file names.

**Note** These directories are automatically searched by Visual Cafe: the installation directory, and the release \bin and \help directories.



## Choosing the SDI or MDI window system for the development environment

```
{button Concepts,AL('Projects_overview;MDI_overview;Workspace_customization_overview',0,'')} {button See  
Also,AL('Creating_a_Project_howto;Environment_Options_Dialog_F1',0,'','visual')}
```

Visual Cafe Professional edition has a Customizable User Interface. You can use Single Document Interface (SDI) or Multiple Document Interface (MDI) for your development environment. SDI was used exclusively in versions of Visual Cafe prior to version 2.5.

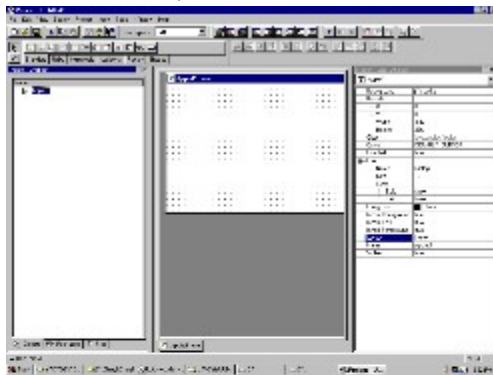
1. Choose Tools ► Environment Options
- General Tab.
2. Select MDI Development Environment to enable MDI, or deselect it to enable SDI.

## Using the MDI development environment

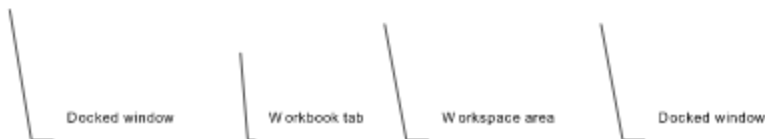
```
{button Concepts,AL('Projects_overview;Workspace_customization_overview',0,'')} {button See  
Also,AL('Creating_a_Project_howto;Environment_Options_Dialog_F1;Workspaces_AUD_howto;SDI_or_MDI_howto',0,'visual'  
)}
```

Visual Cafe Professional edition has a Customizable User Interface. You can use Single Document Interface (SDI) or Multiple Document Interface (MDI) for your development environment. SDI was used exclusively in versions of Visual Cafe prior to version 2.5.

Here is an example of what MDI looks like.



Expand or collapse  
a docked window  
with this button



While using MDI, you work with regular windows, which appear in the workspace area, and dockable windows, which can be docked along the edges of your Visual Cafe workspace or can be floating in the workspace area. Here are some of the dockable windows:

Project window	Breakpoints
Property List	Watch
Component Library	Variables
Messages	Calls
Find in Files results	Threads

A dockable window can be docked only if Docking View is enabled.

**Note** Docked windows have the same highlight color in the title bar as a regular window that is selected. To make sure that a docked window is the active window, click it.

When using MDI mode, some window positions are saved with the workspace and the project. For more information on setting your workspace options, see [Visual Cafe workspaces](#).

### To toggle Docking View for a dockable window

- Right-click the window then choose Docking View.
- Activate the window then choose Window ► Docking View.

If the window was previously docked and you enable Docking View, the window might dock again.

### To dock a window floating in the workspace area

- While Docking View is enabled, drag the window to the edge of the workspace.  
A docked window takes up an entire side of the workspace, unless another window is docked along the same side.

#### **To undock a window**

- Double-click the title bar.
- Drag the window into the workspace area.
- Right-click the window and choose Docking View.
- Activate the window then choose Window ► Docking View.

#### **To change the size of a docked window**

- Move the cursor over the edge of the window until the cursor changes, then drag. You can drag the edge facing the center of the main window.

#### **To prevent a dockable window from docking while dragging it**

- Press CONTROL while dragging.

#### **To expand or collapse a docked window**

- If you have more than one window docked along an edge, you can expand or collapse one of the windows by clicking the triangle button in the corner of the window.

#### **To change the display of windows in the workspace area**

The workspace area contains regular windows, such as the Form Designer or Source window, and dockable windows that are not docked. These dockable windows can have Docking View enabled or disabled.

- Choose Window ► Cascade, Tile Horizontally, or Tile Vertically.
- Drag the windows within the workspace area.

#### **To toggle the display of Workbook tabs**

At the bottom of the workspace area, you can display Workbook tabs — one for each open window (either regular windows or dockable windows with Docking View disabled). Clicking a tab activates that window in the workspace area.

- Choose View (or Window) ► Workbook.

#### **To activate a window in the workspace area**

- Click it.
- Click a Workbook tab.
- Choose Window ► Next or Previous.
- Choose the window from the Window menu.

#### **To toggle the display of the status bar**

- Choose View (or Window) ► Status Bar.



## Using Visual Cafe version 2.1 menus

```
{button Concepts,AL('Using_Visual_Caf_as_Your_Development_Environment',0,','')} {button See  
Also,AL('Setting_General_Environment_Options_General_tab_F1;Environment_Options_Dialog_F1;Workspaces_AUD_howto',0  
,','')}
```

You can use the 2.1 version of the Visual Cafe menus instead of the latest menus. For example, Visual Cafe version 2.1 did not have a View menu, whereas later versions of the Professional edition do have one. Some items from the Window menu were moved to the View menu (menu items that opened a specific type of window, such as the Component Library menu item). You can specify that you want to use the old menu system, so that all View menu items appear in the Window menu instead. One reason you might want to do this is if you have scripts that rely on the older version of the Window menu.

1. Choose Tools ► Environment Options

► General tab.

2. If you want to use an earlier version of Visual Cafe menus, select Use 2.1 Menus. Otherwise, deselect it.

## ▶ Setting debugging options for the environment

```
{button  
Concepts,AL(^Using_Visual_Caf_as_Your_Development_Environment;Incremental_debugging_overview;Visual_Caf_Tools_for_  
Working_with_Classes_and_Components',0,','')} {button See  
Also,AL(^Defining_the_Help_File_Set_howto;Defining_Visual_Caf_s_Startup_Mode_howto;Environment_Options_Dialog_F1',0,  
'')} }
```

There are several Visual Cafe debugger options that apply to the entire environment.

### To set environment options for debugging

- Choose Tools ▶ Environment Options, then click the Debugging tab.

### To enable or disable the run-time editing option

Visual Cafe Professional edition offers [incremental debugging](#) (also called run-time editing). While your program is running in the Visual Cafe debugger, you can edit your Java program and immediately see the effects of the code change.

- Select the appropriate option:
  - Always compile changes and update program, no prompt — Enables run-time editing so that choosing a Save menu item causes new changes to be compiled and reflected in an executing program. If the program is paused, resuming it causes all changes to be applied and saved. (This is the default.)
  - Prompt before compiling changes and updating program — Enables run-time editing the same as the first option, except that you are prompted first, so you can choose to stop run-time editing.
  - Always ignore changes — Disables the run-time editing feature. (Visual Cafe version 1.0 worked this way.)

### To enable or disable **ValueTips** at debug time

1. Select or clear the Enable ValueTips option.
2. If selected, set the delay time before a tip displays.

### To switch to the Debug **workspace** when running in the debugger

- Select this option to go to the workspace named Debug when you choose Project ▶ Run in Debugger. Deselect this option if you want to remain in the current workspace. The default is selected.

## Specifying text formatting for Visual Cafe windows

```
{button  
Concepts,AL('Using_Visual_Caf_as_Your_Development_Environment;Visual_Caf_Tools_for_Working_with_Classes_and_Comp  
onents',0,',';')} {button See  
Also,AL('Format_Options_Dialog_F1;Custom_keywords_dialog_F1;Customizing_your_enviro_appearance_Display_tab_F1_ho  
wto;Environment_Options_Dialog_F1;Source_Window_F1;Class_Browser_using_F1',0,',';')}
```

You can define a format style for different file types displayed in the Visual Cafe windows. The initial file types that are available are Java and HTML.

### To open the Environment Options Format view

- Choose Tools ► Environment Options

► Format tab.

### To set format options for files with a certain extension

1. Choose the file extension you want to customize. To create a new file extension entry, click New and enter the extension in the dialog box. To remove an extension from the list, choose it then click Delete.

<UNTITLED> is the same type you get after choosing File ► New File.

<UNKNOWN> is a file extension that does not have specific format options set for it. This is the type of file that you get when you save a file as an "unknown" type.

2. Set the options you want to apply to files with this extension. To highlight language keywords, choose the language from the Language keywords drop-down list.

Option	Description
Word wrap	Enables word wrap. While typing, lines that extend beyond the right margin are automatically broken at the last word boundary before the margin.
Check delimiters	If you type a right parenthesis, square bracket, or brace, the editor briefly highlights the corresponding left delimiter. If no matching delimiter is found, an error message is displayed in the status bar.
Indent after brace	If the last character typed on a line is a left brace, the next line is automatically indented by an extra tab stop. This option only works if Indent Automatically is selected in the buffer.
Indent automatically	Automatically indent on newline. When you press ENTER, the editor positions the cursor directly below the first character in the previous line.
Change tabs to spaces	Tabs are inserted into the text as an appropriate number of spaces, rather than as tab characters.
Remove trailing spaces	Trailing spaces and tabs are removed from the end of each line when a file is saved.
Enable custom keywords	You can maintain a set of custom keywords that highlight in a specified manner within the edit window. There is one custom keywords list that applies to all file types that have the Enable custom keywords option. Click Edit Custom to specify custom keywords. To set highlighting for custom keywords, click the Display tab.
Indent comments at	If selected, the editor automatically indents the comment to a specified alignment column when you type "/" or "/"* to start a comment. You can specify the alignment column in the adjacent text box.
Tab width	Specifies the number of columns between tab

stops (1-16). The default is four character widths. This value may be overridden locally in each buffer.

Right margin Specifies the column that acts as the right margin for word wrapping. (1-512). This value may be overridden locally in each buffer.

### **To specify custom keywords**

Custom keywords are recognized in the Source window or pane. They are highlighted in red by default. You can change the display attributes of custom keywords in the Environment Options Display tab. There is one custom keywords list that applies to all file types that have the Enable custom keywords option.

- Click Edit Custom.

The Custom Keywords dialog box opens so that you can enter the new keywords.





## Using the Enter New File Extension dialog box

```
{button Concepts,AL(^Using_Visual_Caf_as_Your_Development_Environment',0,','')} {button See  
Also,AL(^Defining_auto_filetype_formatting_F1_howto;Environment_Options_Dialog_F1',0,','')}
```

**Environment Options ▶ Format tab**

### ▶ New

Enter the file extension that you want to add to the format type list.

When the extension is available from the list, you can define a format style for the file type. Two predefined file types are Java and HTML.



## Using the Custom Keywords dialog box

```
{button Concepts,AL(^Using_Visual_Caf_as_Your_Development_Environment',0,','')} {button See  
Also,AL(^Defining_auto_filetype_formatting_F1_howto;Environment_Options_Dialog_F1',0,','')}
```

**Environment Options ▶ Format tab**

### ▶ Edit Custom

Use the Custom Keywords dialog box to add keywords to the list of words recognized in the Source window and pane.

To add a new keyword, type the keyword into the text box and click Add.

To remove a keyword from the list, click the keyword in the list and click Remove.

## Mapping Visual Cafe commands to key sequences

```
{button  
Concepts,AL('Using_Visual_Caf_as_Your_Development_Environment;Visual_Caf_Tools_for_Working_with_Classes_and_Comp  
onents',0,',';')} {button See  
Also,AL('Format_Options_Dialog_F1;Customizing_Editing_windows_Editing_tab_F1;Defining_auto_filetype_formatting_F1_how  
to;Mapping_commands_to_keyboard_F1_howto;Environment_Options_Dialog_F1;Source_Window_F1;Class_Browser_using  
_F1',0,',';')}
```

Visual Cafe lets you define a custom keystroke sequence for many Visual Cafe editing operations and macros. Macros are stored in the command list as *macrofilename*. ScriptMaker macro files, stored in \Bin\Macs, appear in the list.

Your settings can be saved in a key file, stored in the \Bin\Keys directory. Saving to a file allows you to reload or distribute the key assignments. In version 2.5 of the Professional edition, a VJ key file was added so you can use Visual J++ keyboard commands.

**Note** Help on the commands is available in the Macro help. This help is available from the Help menu and by pressing F1 when you are editing macros.

In the Keyboard view of the Environment Options, you can also specify editing options for the Source Editor.

### To access the Environment Options Keyboard view

- Choose Tools ► Environment Options
- Keyboard tab.

### To choose a key file to use in the Visual Cafe environment

- Choose a file in the File field.

### To add a key file to the list

- When you start modifying the assignments, Untitled appears in the list. You can save it under another name.

### To delete a key file

- Choose a file in the File field, then click Delete.  
The file is deleted from your hard disk.

### To map a command to a key sequence

1. Choose a key file.
2. From the command list, select a command.  
If an item has more than one key assignment, the item appears multiple times in the list.  
**Tip** Click the column header to sort the list by command or key assignment, and by forward or reverse alphabetical order.
3. To specify a key assignment, click in the New Key Assignment field and specify the key sequence as follows:
  - Press the key sequence.
  - Click a button in the Insert Key area.If the value that you enter is already mapped to a command or macro, that command name appears in the Assigned To area.  
**Tip** A command can have multiple key assignments. If the command already has a key assignment and you specify another assignment, the command now has two separate assignments.
4. Assign the key sequence to the command by clicking Assign.  
The assignments are automatically saved in an untitled file.
5. To save the settings to a file, click Save.  
In the dialog box, specify the name of a new or existing **key** file. Saving to a file allows you to reload or distribute the key assignments. Key files are stored in the \Bin\Keys directory.

### To delete the key assignment for a command

- Select the command in the Command list and click Unassign.

### To copy the command assignment list as text

- Right-click in the Command list and select Copy All.  
You can paste the list into another window, such as the Source window.

**To modify what commands are shown**

- Right-click in the Command list and choose Unbound commands, All, Member, Text, or Class.  
Unbound commands toggles the display of commands without key assignments.  
Member, Text, and Class toggle display of commands that start with these words.

**To specify key editing options for the Source window and pane**

- Click More and select options in the dialog box.
- ▶ [Details on this step](#)

## Specifying key editing options for the Source Editor

```
{button Concepts,AL(^Using_Visual_Caf_as_Your_Development_Environment;Visual_Caf_Tools_for_Working_with_Classes_and_Comp  
onents',0,','')} {button See  
Also,AL(^Format_Options_Dialog_F1;Customizing_Editing_windows_Editing_tab_F1;Defining_auto_filetype_formatting_F1_how  
to;Mapping_commmands_to_keyboard_F1_howto;Environment_Options_Dialog_F1;Source_Window_F1;Class_Browser_using  
_F1',0,','')}
```

These settings apply to all Source windows and panes.

1. Choose Tools ▶ Environment Options

▶ Keyboard tab.

2. Click More.
3. Select the options you want:

Option	Description
Virtual cursor	When checked, you can position the cursor anywhere in the file, regardless of the placement of the line endings. When unchecked, you cannot position the cursor past the end of a line. This box is unchecked by default.
Brief menu accelerators	Disables menu keys. After this is selected, any new windows will not have any underscores beneath the top-level menu items.
Brief-compatible selection	If you choose this option, the editor stays in selection mode when you use the arrow keys.
Typing replaces selection	When checked, the source editor follows the Windows standard convention of replacing any selected text with the first character typed or pasted. When unchecked, typing or pasting inserts the text to the left of the current selection. This box is checked by default.
Normal selection for debugging	Enables normal selection of text when in debugging mode. If cleared, you can drag from the source window to the Variables, Watch, and Thread windows while debugging.
Cut and copy line without selection	When checked, you can quickly cut or copy the current line using the standard cut or copy keystrokes (without having to first select the line). When unchecked, you can cut or copy a line by using the keys assigned to the EditorCutLine or EditorCopyLine functions. This box is unchecked by default.

## Using the Save Key Bindings dialog box

```
{button Concepts,AL(^Using_Visual_Caf_as_Your_Development_Environment',0,','')} {button See  
Also,AL(^Mapping_commmands_to_keyboard_F1_howto;Environment_Options_Dialog_F1',0,','')}
```

**Environment Options ▶ Keyboard tab**

▶ Save

Use the Save Key Binding dialog box to save a **key** file.

## Customizing the font and color in Visual Cafe windows

```
{button
Concepts,AL('Using_Visual_Caf_as_Your_Development_Environment;Visual_Caf_Tools_for_Working_with_Classes_and_Comp
onents',0,','')} {button See
Also,AL('Customizing_Editing_windows_Editing_tab_F1;Customizing_Source_Window_editing_howto;Setting_the_cursor_style
_howto;Environment_Options_Dialog_F1;Source_Window_F1;Class_Browser_using_F1;Hierarchy_Editor_F1',0,','')}
```

Visual Cafe allows you to set the font, style, and colors for development environment windows, Visual Cafe editors, and window items. You can also change the appearance of elements in your source code; for example, comments, keywords, current line, and breakpoints.

### Note

- When you select All Windows, the Color and Style list displays a set of common components. Common component changes apply to all objects that contain the component.
- There is only one Text entry; changing the color and style for it changes the text color for all windows.

### To access the Environment Options Display view

1. Choose Tools ► Environment Options

► Display tab.

### To set the font or font size

1. In the Category area, select the item whose appearance you want to modify.
2. Choose a value for font or font size.

### To set the color and style

1. In the Category area, select the item whose appearance you want to modify.
2. Select an item in the Color and Styles list, then choose a value for Foreground or Background, or select Bold or Italic.

The default setting is the default text color as set in the Windows control panel.

Here are explanations of some items:

Item	Description
Text	Text other than the type defined below.
Selected text	The text and background of selected text.
Errors	Lines where compiler errors are found.
Comments	Java comments.
Keywords	Java keywords.
Current Line	The line that contains the insert point.
Preprocessor	Java preprocessor directives.
Custom keywords	Special keywords that you define.
Execution	During debugging, the current execution line.

## Specifying backup and save options

```
{button
Concepts,AL('Using_Visual_Caf_as_Your_Development_Environment;Visual_Caf_Tools_for_Working_with_Classes_and_Comp
onents',0,','')} {button See
Also,AL('Automating_project_backups_howto;Setting_the_Scope_of_the_Undo_Command_howto;Environment_Options_Dialog
_F1',0,','')}
```

Visual Cafe provides several backup and save options:

[Saving files for recovery purposes](#)

[Automating source file backups](#)

[Setting the scope of the Undo Command](#)

## ▶ Saving files for recovery purposes

```
{button Concepts,AL('Projects_overview;Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,','')} {button See  
Also,AL('Defining_Save_and_Backup_Options_Saving_Tab_F1;Environment_Options_Dialog_F1',0,',';visual)}
```

You can automate the saving of files in temporary locations so you can recover changes if there is a system failure.

1. Choose Tools ▶ Environment Options

▶ Backup tab.

2. Select Save Automatically and choose a time interval.

When selected, each modified edit buffer is saved at regular intervals in a temporary file in the temp home directory. Under normal circumstances, these temporary files are automatically deleted when the editor exits. If a system crash or power failure occurs, the editor will not exit normally and these temporary files are not deleted. This permits you to recover work that would otherwise be lost. The temporary files created by the autosave function have names that begin with the character ~, followed by a unique number and the extension **.sav**; for example, ~4289352.sav.

For identification purposes, the autosave function adds a line in the following format at the beginning of each temporary file:

```
; Visual Cafe AUTOSAVE C:\DIR\FILENAME.EXT 08-12-95 7:35 pm
```

This line contains the complete path name of the corresponding file and the date and time of the autosave, formatted as a Java language comment. The rest of the temporary file, starting with line 2, stores the contents of the buffer at the time the autosave was performed.

To recover from a system crash or power failure, examine each file with the extension **sav** in the TEMP directory.





## Automating source file backups

```
{button Concepts,AL('Projects_overview;Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,',')} {button See Also,AL('Defining_Save_and_Backup_Options_Saving_Tab_F1;Environment_Options_Dialog_F1',0,',','visual')}
```

You can control whether files in a project are automatically backed up each time that a save is performed. You can also specify the location and name of the backup files.

**Note** Only Java and HTML files that have changed are backed up. For example, if you save all files in a project, only the files that have changed are backed up.

To automate project backups:

1. Choose Tools ► Environment Options
- Backup tab.
2. Select Backup files on Save.
3. Select the location and name of the backup files:

Select...	To specify this...
Create BAK file	Create one or more backup files that are named <i>file.bak</i> .
Copy to directory	Copy the source files to the specified directory. You can type the directory with the full path into the text box, or click ... to select a directory from a dialog box. There is no default.
Invoke OnBackup script	Run your own macro, created with the Visual Cafe macro utility and containing an <b>OnBackupFile</b> statement. All macros are placed in the \VisualCafe\Bin\Macs directory.



## Setting the scope of the Undo command

```
{button Concepts,AL('Using_Visual_Caf_as_Your_Development_Environment;Visual_Caf_Tools_for_Working_with_Classes_and_Components',0,',')} {button See Also,AL('Defining_Save_and_Backup_Options_Saving_Tab_F1;Environment_Options_Dialog_F1',0,',','')} {button See Also,AL('Defining_Save_and_Backup_Options_Saving_Tab_F1;Environment_Options_Dialog_F1',0,',','visual')}
```

The Undo command is available from the Edit menu and has standard Windows functionality. The default number of undoable actions is 100.

1. Choose Tools ► Environment Options
- Backup tab.
2. In the Save actions for undo field, enter the number of previous actions that you want Visual Cafe to store for each window.

## Specifying code editing options

```
{button  
Concepts,AL('Using_Visual_Caf_as_Your_Development_Environment;Visual_Caf_Tools_for_Working_with_Classes_and_Comp  
onents',0,','')} {button See  
Also,AL('Customizing_Editing_windows_Editing_tab_F1;Customizing_Source_Window_editing_howto;Setting_the_cursor_style  
_howto;Environment_Options_Dialog_F1;Source_Window_F1;Class_Browser_using_F1;Hierarchy_Editor_F1',0,','')}
```

Visual Cafe allows you to change standard editing functionality for Source windows, the Class Browser, and the Hierarchy Editor.

### To access the Environment Options Editing view

- Choose Tools ▶ Environment Options
- ▶ Editing tab.

### To set the cursor style

In the Source window or pane, you can toggle between Insert mode and Overwrite mode by pressing the Insert key. In Overwrite mode, the new characters overwrite the existing text.

- Set the options you want for each mode.

Option	Description
Block	Covers the current character.
Underline	Underlines the current character.
Vertical bar	The standard insertion point cursor, displays between characters.
Blink	When selected, the cursor blinks. You can set the blink rate in the Windows control panel.

### To set confirm and multiple selection options for the Class Browser and Hierarchy Editor

- These options set functionality for both the Class Browser and Hierarchy Editor.

Option	Description
Confirm Delete member	Requires confirmation of member deletions.
Confirm Inheritance change	Requires confirmation of inheritance changes.
Multiple selection	Specifies if you can select multiple classes in the Class Browser and Hierarchy Editor. If you select "Confirm," you can select multiple classes; changes to multiple selections require confirmation.

### To show horizontal scroll bars

- Select this option to display a horizontal scroll bar at the bottom of Source windows and panes. (It is selected by default.)



## Setting the cursor style

```
{button  
Concepts,AL('Using_Visual_Caf_as_Your_Development_Environment;Visual_Caf_Tools_for_Working_with_Classes_and_Comp  
onents',0,';')} {button See  
Also,AL('Customizing_Editing_windows_Editing_tab_F1;Environment_Options_Dialog_F1;Source_Window_F1;Class_Browser_  
using_F1',0,';')}
```

You can set the cursor style for the insert and overwrite cursor.

1. Choose Tools ► Environment Options
- Editing tab.
2. In the Insert or Overwrite definition area, select or clear the Blinking option.
3. Select the cursor style: Block, Underline, or Vertical Bar.

## ▶ **Controlling toolbar position and visibility**

```
{button Concepts,AL('Palette_F1;Toolbars_standard_F1',0,'')} {button See  
Also,AL('Customizing_the_Palette_from_the_Palette_Tab_F1;Environment_Options_Dialog_F1',0,'')}
```

Visual Cafe toolbars are at the top of the Visual Cafe main window. You can control toolbar position and visibility.

### **To float a toolbar**

- Drag the toolbar from the top of the Visual Cafe window onto your desktop.
- Double-click somewhere in the toolbar background.

### **To dock a toolbar**

- Drag the toolbar to the top of the Visual Cafe window.
- Double-click somewhere in the toolbar background.

### **To hide/show a toolbar**

- Right-click at the top of the Visual Cafe window and select the toolbar name.
- Click the close box on the toolbar.



## Setting the database environment options

```
{button Concepts,AL('Overview_of_Visual_Caf;Using_Visual_Caf_as_Your_Development_Environment',0,'')} {button See  
Also,AL('Environment_Options_Dialog_F1;Project_Options_dialog_F1',0,'')}
```

When you install the Database Development Edition of Visual Cafe, a Database tab is added to the Environment Options dialog box. You use this view to

- choose what API to use when Visual Cafe Database Development Edition generates code related to databases
- set the default data types for components in the dbAWARE Project and Table Wizards (Choose Database Columns page) and when you drag a column to a project from the dbNAVIGATOR window

### To access the Environment Options Database view

- Choose Tools ► Environment Options
- Database tab.

### To choose an API

- Select [JDBC API](#) or [dbANYWHERE API](#).

### To set a default data type for a component

1. Click the Component field of any data type to see the drop-down list of component data type options.
2. Choose an appropriate data type for your component.

### To return to the default data types

You can return to the defaults that shipped with Visual Cafe Database Development Edition.

- Click Set Defaults.

Obsolete

## Customizing toolbars

```
{button Concepts,AL('Palette_F1;Toolbars_standard_F1',0,'')} {button See  
Also,AL('Customizing_the_Palette_from_the_Palette_Tab_F1;Environment_Options_Dialog_F1;Controlling_Position_and_Visibil  
ity_howto',0,'')}
```

<<Add this back for NextGen. Need to rework.>> You can customize the toolbars in your Visual Cafe workspaces. This is helpful if, for example, you primarily use certain toolbar buttons when debugging, and use different toolbar buttons when you are designing.

You can either rearrange or remove buttons from current toolbars, or create a new one with your own combination of toolbar buttons. You can customize all toolbars, except for the Workspaces toolbar and the Component Palette. Use the Customize dialog to make changes to your toolbars, or edit them right from the desktop.

To customize your toolbars, you can:

- access the Customize dialog box
- view or hide a toolbar
- create a new toolbar
- add buttons to a toolbar while in the Customize dialog
- add buttons to a toolbar from the desktop
- rearrange buttons on a current toolbar
- set your toolbars back to their defaults

### To customize toolbars from the Customize Toolbars dialog box

- Choose View ► Toolbars
- Customize.
- Right-click a toolbar and choose Toolbars.

### To view or hide a toolbar

1. In the Customize dialog box, select the Toolbars pane (if it isn't already selected).  
A listing of available toolbars displays.
2. To make a toolbar visible in the workspace, click the box to the left of the toolbar name. A checkmark appears next to the name of a visible toolbar.  
To hide a toolbar in the workspace, click the box to the left again. The checkmark disappears, and the toolbar hides from view.

### To create a new toolbar

1. Click View ► Toolbars.  
The Toolbars dialog displays.
2. Click New.  
The New Toolbar dialog displays.
3. Enter a name for your toolbar, and click OK.  
The Customize dialog displays with your new toolbar listed in the Toolbars list.  
Another way to create a new toolbar is from the Customize dialog. From the Toolbar pane, click New, and enter the name for your new toolbar. Once you click elsewhere in the dialog your new toolbar shows in the toolbar list.  
You can add buttons to a toolbar by one of two ways. You can add buttons from the Customize dialog, or you can drag buttons from existing toolbars to your new toolbar.

### To add buttons to a toolbar while in the Customize dialog

1. Open the Customize dialog box for toolbar editing.
2. Make sure your toolbar is visible in the workspace area. You may want to move it closer to the Customize dialog to facilitate editing.
3. In the Customize dialog, click the Commands pane.  
The Commands pane displays a list of standard toolbar button categories.
4. Click one of the four standard toolbar names to access toolbar buttons available in those categories. Click a desired button,

and drag it to your toolbar. Your standard toolbars will remain intact.

**To add buttons to a toolbar from the desktop**

1. Make sure your toolbar is visible in the workspace area.
2. Alt-click a button to drag it to another toolbar.

**Note** This action moves, not copies, a toolbar button to another toolbar. The toolbar button is removed from the original toolbar.

**To rearrange buttons on a current toolbar**

- Alt-click and drag to rearrange buttons right on the toolbar itself. You can do this with standard toolbars and also ones you've created.

**To set your toolbars back to their defaults**

- In the Customize dialog box, click Reset.

Your toolbars go back to what they looked like when you first installed Visual Cafe. Any customizations to your toolbars, such as rearranged, removed, or added toolbars, are nullified.





## Enabling ValueTips

```
{button Concepts,AL('Using_Visual_Caf_as_Your_Development_Environment',0,','')} {button See  
Also,AL('Setting_General_Environment_Options_General_tab_F1',0,','')}
```

ValueTips display the value of a variable in the Source window when you place your cursor over the variable at debug time.

1. Select Tools ▶ Environment Options.
2. Click the Debugging tab.
3. Select or clear the Enable Value Tips option.
4. If selected, set the delay time before a tip displays.

## Customizing Class Browser and Class Hierarchy window editing

```
{button Concepts,AL('Class_Browser_using_F1;Hierarchy_Editor_F1',0,',')} {button See  
Also,AL('Customizing_Editing_windows_Editing_tab_F1;Visual_Caf_Tools_for_Working_with_Classes_and_Components;Source_Window_F1',0,',')}
```

You can enable multiple component selection and select confirmation options for both the Class Browser and the Class Hierarchy.

1. Choose Tools ► Environment Options

### ► Editing tab

2. In the Class Browser and Class Hierarchy area, select or clear appropriate options:

Option	Description
Confirm Delete member	Display a confirmation message before deleting a class member.
Confirm Inheritance change	Display a confirmation message before applying inheritance changes.
Multiple selection	Display a confirmation message before applying a change to multiple selected objects. Yes - allow multiple select. No: disallow multiple selects. Confirm: allow but confirm changes to multiple select.

**Note** You can also enable a horizontal scroll bar in the Class Browser source pane by selecting the ShowHorizontal scroll bar option in the Source window area.



## Changing editor properties

```
{button Concepts,AL('Using_Visual_Caf_as_Your_Development_Environment',0,'')} {button See  
Also,AL('Format_Options_Dialog_F1;Defining_auto_filetype_formatting_F1_howto;Customizing_your_enviro_appearance_Displ  
ay_tab_F1_howto;Environment_Options_Dialog_F1',0,'')}
```

You can change the behavior of the Visual Cafe editors to suit your individual work needs. Global changes can be made with the Environment Options dialog box, Tools ► Environment Options. Local changes can be made to an editing session by using the Format Options dialog box, Source

### ► Format Options.

The following items can be customized:

#### Font Style and Size

Sets the appearance of text in Source windows.

#### Colors

Both foreground and background color for the selected window can be customized. You can also preset the colors for certain text items. The items for which you can change the color include: breakpoint text, code window text, comment text, current statement text, custom keyword text, error text, identifier text, keyword text, next statement text, and selection text.

#### Tab to Space Conversion

Converts tab characters to spaces as you type. You can also preset the number of spaces used for each tab character.

#### Automatic Source Formatting

Automatically formats code as it is entered, indenting lines of code and adding closing braces and parentheses.

## **About Optlink Error Messages**

This section lists warnings, plus non-fatal and fatal error messages generated by OPTLINK. When appropriate, any probable cause and/or remedy is briefly discussed. The DOS return code and segmented `.exe` error flag is set upon OPTLINK encountering either a Non-Fatal or Fatal error. Warnings have no effect on the code or flag. See also `/ONERROR` and `/DELEXECUTABLE`.

## **How OPTLINK Errors are Displayed**

Each warning and error message, with added information such as the symbol name or file name involved, is displayed to the STDOUT device and added to the `.map` file (if selected) when its triggering condition is detected. If a log of errors is desired, DOS redirection may be used.

The following rules apply when displayed: If the file name is known, it is printed. If the module name is known, it is printed (useful especially if the file name is `.lib`). If the error occurs at a known offset in the file, the offset (in hexadecimal) is printed. If a specific object record is being worked on, its record type (a number in hex corresponding to the standard Intel OMF or some extension) is printed. And in every case, an error number (not significant since these numbers may vary between OPTLINK versions and/or other linkers) is printed followed by the text.

## Warning Messages

OPTLINK provides several warnings, which alert the operator to an inconsistency rather than diagnosing a known error. These messages indicate code that may not execute as you expect but that does link. OPTLINK completes its operation and the output file may be usable.

### **ALIAS Previously Defined**

An attempt to alias an already-defined symbol was detected. The `ALIAS` directive is ignored.

### **Bad Checksum**

A checksum error was detected in an input file. Perhaps the file has been corrupted.

### **Below 100H Cannot Be Initialized**

While creating a `.com` file, an attempt to initialize data areas at an address lower than 0100h was detected.

### **Cannot Allocate EMS Blocks**

An EMS allocation call failed. The EMS driver has provided inconsistent information. OPTLINK will use alternative memory space instead.

### **Cannot Generate Segmented .COM or .SYS File**

A `.com` or `.sys` extension was specified as the output file name when a `.def` file had also been supplied.

### **COMMON Combine type overrides others**

Multiple combine types were specified for a given named segment. In such a conflict, the `COMMON` combine type overrides all others, and the multiple segments will be combined into a single segment.

### **Duplicate RESOURCE, Ignored**

A second resource was found within the `.res` file with the same name and type as one already processed. The second resource is ignored.

### **File Not Found**

The specified `.lib` file could not be found in order to complete command operations. If referring to an `.obj` file or an indirect command file, this indicates a fatal error, described later in the fatal error section.

### **Heap without DGROUP**

Heapsize was defined with no `DGROUP` or zero length `DGROUP`. Causes Windows to crash.

### **Grouped Segments Have Conflicting Flags**

Segments in a single group have different flag settings declared via the `SEGMENTS` directive in the `.def` file. Since a group is a single physical segment in protected mode, all segments that make up the group must have the same flags.

This warning may be caused by the fact that any non-default flags override the default settings. That is, a `MOVABLE` segment overrides a `FIXED` segment, and the whole group becomes `MOVABLE`.

### **LINNUMs in Non-CODE Segment**

A `LINNUM` statement was encountered within a data segment.

### **Missing LIBRARY in .DEF File for .DLL**

A `.dll` extension was specified for the output file, but no `LIBRARY` directive appears in the `.def` file. The `.dll` is created with default assumptions.

**No Stack**

No stack segment was supplied. If a `.com` or `.sys` file is being generated, it is normal; in other cases, be careful.

**No Start Address**

The end of the last `.obj` file was reached and start address was not detected. In assembler programming, start addresses are specified by putting a label after the `END` statement. In high level languages, perhaps the start up modules were not supplied.

**Segment Already in Different Group**

OPTLINK detected a second attempt to assign a segment to a group. Each segment can belong to only one group.

**Stack Already Declared in Module**

OPTLINK detected a second attempt to define a stack segment. Each program can have only one stack segment. The warning is followed by the name of the module that first declared a stack.

**STACK Combine type overrides others**

Multiple combine types were specified for a given named segment. In such a conflict, the `STACK` combine type overrides all others, and the multiple segments will be combined into a single segment.

**Start Previously Specified in Module**

More than one start address was specified for a program. Start addresses are specified by putting a label after the `END` statement. Only one module should specify a start address. If OPTLINK finds more than one, it uses the first one encountered.

**Symbol in this LIB defined elsewhere**

Warning message generated from `/WARNDUPS`.

**Too Many Segments, Trying PACKCODE**

The segmented `.exe` format can hold only 254 segments. This warning appears when more than 254 segments exist and

`/PACKCODE` was not specified. OPTLINK automatically invokes

`/PACKCODE` in an attempt to reduce the segment count to a number below 255.

**Too Many Segments, Trying PACKDATA**

The segmented `.exe` format can hold only 254 segments. This warning appears when more than 254 segments exist after OPTLINK attempted to `/PACKCODE`, and `/PACKDATA` was not specified. OPTLINK automatically invokes `/PACKDATA` in an attempt to reduce the segment count to a number below 255.

**Unknown Option**

OPTLINK encountered a misspelled, incomplete, or unsupported option switch.

**Unsupported GRPDEF Type**

An invalid GRPDEF record was encountered. The bad record is ignored.

## Non-Fatal Error Messages

These are errors which may make the output file unusable, but did not prevent OPTLINK from completing successfully. Processing continues if any of these errors are detected, but the output file that is generated should not be used.

### **.EXE Header > 64k**

The resident portion of a .dll or .exe header approaches or exceeds 64Kb. Windows loads this header into a single segment; therefore, it must be smaller than 64Kb. The sizes of the various pieces that make up the header are listed. You probably need to import/export by ordinal to reduce name table sizes.

### **Bad COMDEF Sizes**

An size error was detected in a COMDEF record.

### **Badly Formed Segment Size**

The BIG bit was set and segment size was not zero.

### **BYTE Out of Range**

Code such as:

```
    mov al, ext_abs
```

where *ext\_abs* is greater than 255, was encountered.

### **Cannot Export**

Symbol cannot be exported. It may be either undefined or a constant. Symbols must have an associated segment to be exported.

### **Cannot Reach TARGET from FRAME**

A traditional "fixup overflow" was detected by OPTLINK. Usually caused by: memory-model conflicts, a segment or group being too large, segment order or combining errors (look at the map file output to diagnose this), incorrect ASSUME statements, trying to access a variable when no segment register points to it, or trying to do a NEAR CALL / NEAR JMP to a FAR routine.

### **CEXTDEF With No COMDAT**

The end of an object file was reached and a CEXTDEF item remains unresolved.

### **COMDAT Continuation Mismatch**

A COMDAT continuation record appears before the COMDAT definition to which it refers. If you get this error, please contact Symantec Technical Support.

### **COMDAT Syntax**

Due to either corrupt files, translator errors, internal errors in OPTLINK, or unknown enhancements to the OMF conventions. If you get this error, please contact Symantec Technical Support.

### **Constants Must Have FRAME=0**

A constant having a FRAME value other than zero was detected. While not prohibited in Intel's OMF format, this is not valid in the Microsoft version.

### **CODE Directive**

A syntax error was detected in a CODE directive.

### **DATA Directive**

A syntax error was detected in a DATA directive.

### **Data Outside Segment Bounds**



OPTLINK found more data in an object module than expected. For example, an object file that indicates 5 bytes of data are to follow, and then provides 6, will cause this error. Most likely cause is that the object file has been corrupted, or that a translator error has occurred.

### **Data Overlaps Relocations**

Displayed while the `/RELOCATIONCHECK` option was in effect and an overlap was detected. Probable causes include initialization of the `COMMON` segment in more than one module, use of the `ORG` statement to back up over existing code, or a translator error. The problem must be resolved, or all other addresses referenced in the output file may be wrong since relocation information is often stored as in-place linked lists.

### **Delimited String Expected**

OPTLINK failed to find a delimited string required by the directive syntax being parsed.

### **DGROUP + Stack + Heap Exceeds 64K - 16**

The total sizes of Heap, Stack, and DGROUP exceed 65,520 bytes. Try reducing the size of the stack or the heap, or use `HEAPSIZE MAXVAL`.

### **Duplicate OLD**

A second `OLD` directive was encountered.

### **Duplicate ORDINAL Number**

The ordinal number specified for this symbol was already specified for use by another symbol. Two exported symbols cannot have the same ordinal number.

### **Duplicate RC Commands**

Both the `RC` directive in the `.def` file and the `/RC` option switch were supplied. Eliminate one of the two to correct the error.

### **Duplicate STUB**

A second `STUB` directive was encountered.

### **EXETYPE Directive**

A syntax error was detected in an `EXETYPE` directive.

### **EXPORTS Directive**

A syntax error was detected in an `EXPORTS` directive.

### **\_Export Conflicts With EXPORTS**

OPTLINK detected a symbol with a different name or parameter list size in the `.def` file than was present in the `.obj` file. They should agree.

### **FIXUPP Points Past Data Record**

OPTLINK detected a situation such as a `FIXUPP` record instructing that the doubleword beginning at byte 5 of a data record be changed, when the data record contains only six bytes (since a doubleword beginning at byte 5 would extend through byte 8). Most likely, the `.obj` file has been corrupted or a translator error occurred.

### **GROUP Cannot Be Both Relocatable and Absolute**

A segment defined as `SEGMENT AT` was placed within a `GROUP` with a normal relocatable segment.

### **Group Cannot Contain CODE and DATA Segments**

Segments in the same group have different type flag settings, via the `SEGMENTS` directive in the `.def` file or their class names. Since a group is a single physical segment in protected mode, the type for the whole group must be either code or data. It cannot contain both types.

### **Group Size Exceeds 64k**

The total size of all segments named within a Group exceeds 65,536 bytes.

### **Groups Overlap**

An overlap of groups was detected. In protected mode, groups are logical segments, and cannot be permitted to overlap. To reorder segments in such a way that the overlap is eliminated, use

`/REORDERSEGMENTS.`

### **HEAPSIZE Directive**

A syntax error was detected in a `HEAPSIZE` directive.

### **Illegal Frame On Start Address**

Detected a `FIXUPP` error on the start address. Check the module defining the start address.

### **Illegal Start Address**

An absolute address was used as a start address in relocatable mode. Correct the address.

### **IMPORT Illegal As Start Address**

The start address was specified as a symbol imported from another library. This is illegal. The start address must be in the `.exe`, not in a `.dll`.

### **IMPORTS Directive**

A syntax error was detected in a `IMPORTS` directive.

### **LOCATION Not Within FRAME**

A `CALL` or `JMP` was made and the `CS ASSUME` is not valid.

### **Library Error**

A library problem was detected. The most likely cause is a corrupted library dictionary.

### **LINSYM Before COMDAT**

A `LINSYM` record points to a non-existent `COMDAT` record. Most likely, caused by either an invalid forward reference or a translator error.

### **Multiple Descriptions**

More than one `DESCRIPTION` directive was encountered in a `.def` file.

### **Only One NAME or LIBRARY Allowed**

More than one `NAME` or `LIBRARY` directive was detected in a `.def` file.

### **Preload Segment + Relocs > 64k, Use -k**

A segment marked for preloading, plus its relocation information, exceeds 65,536 bytes in size. The fast-load section of a Windows `.exe` file cannot accept segments larger than this. You can change the segment to movable, discardable, loadoncall, or disable segment sorting with `-k`.

### **Previous Definition Different**

`PUBLIC` symbol was redefined and the second definition differs from the first.

### **PROT vs REAL Conflict**

A conflict between real mode and protected mode syntax was encountered.

### **PUBDEF Must Have Segment Index**

`OPTLINK` encountered a `PUBLIC` symbol that had no reference into a defined `SEGMENT`. Most likely cause is a corrupt object file, due either to a disk accident or translator error.

### **Relocatable Bases Not Allowed in Absolute Mode**

Reference to relocatable data was encountered while processing code in Absolute Mode. That is, the `.obj` module(s) cannot reference segments or groups, cannot do far jumps or calls, and cannot do `DD LABEL`, when generating a `.com` or `.sys` file, unless the target segment has been declared to be absolute (`SEGMENT AT`).

### **Segment >= 4G**

The total size of a 32-bit segment exceeds 4 gigabytes ("4G").

### **Segment Size Exceeds 64k**

The total size of a segment exceeds 65,536 bytes ("64K").

### **SEGMENTS Directive**

A syntax error was detected in a `SEGMENTS` directive.

### **Short JMP Out of Range**

The destination of `short JMP` instruction was more than 125 bytes from the location of the instruction.

### **Start Address Must Be 100H**

The `.com` file option has been selected and a starting address (`END start_addr`) other than `0100h` was also specified.

### **Symbol Undefined**

A symbol remained undefined after all input files, including libraries, had been processed.

### **Too Many ENTRIES**

More than 65,536 entries were specified.

### **Too Much DEBUG Data for Old CodeView Format**

OPTLINK detected more than 64KB of debug information per type per module, and the CodeView option has been enabled for a CodeView version prior to 4.0.

### **Unknown COMDAT Allocation Type**

Either corrupt files, translator errors, internal errors in OPTLINK, or unknown enhancements to the OMF conventions. If you get this error, please contact Symantec Technical Support.

### **Unrecognized data in .CFG**

Syntax error within `optlinks.cfg`.

### **Unrecognized FIXUPP Type**

Most likely cause is the object file has been corrupted, or a translator error has occurred.

### **Unrecognized Record**

A record in an object file cannot be recognized as one of the defined record types. The unrecognized record is skipped and linking continues.

### **Weak EXTRN Different**

A "weak EXTERN" declared with a different default in another module was encountered.

### **WeakLazyAlias Internal**

A specific internal error condition was detected in OPTLINK. If you get this error, please contact Symantec Technical Support.

## Fatal Error Messages

The following errors prevent a successful completion of OPTLINK, processing stops immediately upon detection. An executable or possibly a partial executable may have been created. This file is unusable and should be deleted.

### **.DEF Syntax Error**

An invalid `.def` file syntax could not be parsed.

### **.RES File Corrupt**

The compiled resource (`.res`) file was found to be corrupt. To correct it, rebuild the file using the `rc.exe` resource compiler and its `/r` option switch.

### **APPLOAD Must Appear Before Any Segments**

A segment precedes the `APPLoader` directive in a `.def` file.

### **Bad FIXUPP Thread**

A `FIXUPP` thread was referenced prior to being defined. The `.obj` file is corrupt and must be regenerated. This condition can only be caused by a translator error.

### **Bad LOC Frame in Start Address**

An undefined `FIXUPP` frame was referenced in a start address. The object file is corrupt and must be regenerated. This condition can only be caused by a translator error.

### **Bad OMF Extension**

The format of a type `A0 COMMENT` record cannot be recognized.

### **Bad STUB File**

An error was detected while parsing the specified `STUB` file. Indicates an invalid DOS `.exe` file.

### **Cannot Create File**

A requested output file cannot be created. Most probable causes are the requested file name contains an invalid character, or the output disk directory is full (applicable only to root directories).

### **Cannot parse Class record**

Corrupt debug information.

### **Cannot Reopen Output File**

A file access error was encountered, probably due to a sharing violation on the output file.

### **Circular ALIAS**

A chain of aliases references itself.

### **Colon Expected**

An OPTLINK option that requires a number is requested, and the ":" or following number is not given. Try the operation again, being sure to supply all required numbers.

### **Dictionary Exceeded 512k**

Library dictionaries have a size limit of 512Kb, which is unlikely to ever be reached unless the `/IMPLIB` switch is used incorrectly.

### **Disk Full Writing**

OPTLINK failed to find enough space on the disk to write the required output (or virtual memory) file.

### **DOS Critical Error**

DOS detects a "critical error" while processing a read or write function for OPTLINK.

### **DOSSETFILEINFO Error**

An OS/2 critical error occurred.

### **EMS Error**

OPTLINK was notified of an EMS error while attempting to access expanded memory. The only known causes for this error are faults in either the EMS driver or the EMS hardware.

### **EXPORTed Names Text >64k**

The exported names text exceeds the limit. Try using the `/NONAMES` link option.

### **Filename Expected**

OPTLINK failed to encounter a required file name as input.

### **File Not Found**

Commands were given to perform an operation with a object file which cannot be found.

### **Illegal Filename**

A file name cannot be parsed into a valid format.

### **Illegal Record Syntax**

OPTLINK was unable to decipher the syntax of a record in an object file. The most likely cause is that the object file is corrupt, due either to a disk accident or to a translator error.

### **/IMPLIB Needs Larger /PAGESIZE**

Set the `/PAGESIZE` link option to a larger number.

### **Incremental Compile Error**

A record was detected that says the `.obj` file being processed is corrupt. Compilers such as Microsoft Quick C may create such records upon detecting certain errors during a incremental compile.

### **Index Range**

A record in the object file provides an index value which is outside the allowable range of values. The most likely cause is that the object file is corrupt, due either to a disk accident or to a translator error.

### **Indirect File Nested Too Deep**

The nesting level for indirect files exceeds 10.

### **Limit of 65535 Base FIXUPPs Exceeded**

Attempted to created more than 65,535 relocation entries for a real-mode executable. This limit is imposed by the structure of the `.exe` file.

### **Module or Dictionary Corrupt**

When attempting to read a `.obj` or `.lib` module, the first record was invalid. This error can be caused by passing some other file mistakenly as a `.obj` or `.lib` (syntax error). It also can be caused by invalid library dictionaries built by incompatible tools.

### **Need Larger /ALIGNMENT Value**

The segmented (Windows or OS/2) executable is larger than  $64KB * ALIGNMENT$ . Alignment is the page boundary in the `.exe` or `.dll` on which all segments will start. These segments are referred to elsewhere by a 16-bit page number. OPTLINK defaults to an `ALIGNMENT` of 16 (limits an executable to 1MB) to reduce wasted space between segments, while other linkers normally waste space by defaulting 512. To fix the problem, increase the `ALIGNMENT` size.

### **No Segments Linked!**

No input files could be processed. Therefore, no file could be created.

### **Not a Valid Library File**

A `.lib` file fails to meet the criteria for `.lib` files.

### **Number Overflow**

A number greater than 65,535 (16 bits) was supplied on the command line.

### **OBJ Record Too Long**

An object record exceeds 6000 bytes in length. The `.obj` or `.lib` file is probably corrupt.

### **Out of Memory**

OPTLINK does not have enough memory to continue operation. OPTLINK needs to have a minimum of 200KB available. Try removing a TSR or two, and link again, or (if you are using a makefile) link from outside the MAKE program.

### **Overflow 32-bit Multiply**

OPTLINK's far global data allocation routines encounter an address value which they cannot successfully calculate. While it is documented here for completeness, you are not likely to see this message.

### **Selector Already Released**

As a result of an internal processing error within OPTLINK. If you get this error, please contact Symantec Technical Support.

### **Swap File Full**

Virtual memory is exhausted. Delete any unnecessary files from your disk and try again.

### **Token Too Long**

A symbol name or other token exceeds the 468-character limit. The `.obj` or `.lib` file is probably corrupt. The too-long symbol is appended to the message.

### **Too Many Relocs to EXEPACK**

More than 8,191 segment relocations per 64KB of data were involved while performing EXEPACK on real-mode executable.

### **Too Many Segments For Segmented .EXE Format**

The segmented `.exe` format can hold only 254 segments. Number of segments has been exceeded, even after `/PACKCODE` and `/PACKDATA` have been used. Try using `.dll`'s to contain some segments and thus reduce the size of this module.

### **Too Much EXESTR Data**

More than one megabyte of EXESTR data (created by a MSC6.0 pragma) exists. OPTLINK supports up to one megabyte of EXESTR data.

### **Unexpected End of File**

OPTLINK encountered the end of an input file before finding a MODEND record. The most likely cause is that the object file is corrupt, due either to a disk accident or to a translator bug.

### **Unknown FIXUPP Frame Type**

OPTLINK was unable to determine the frame type of a FIXUPP record in an object module. Most likely cause is that the object file has been corrupted, or that a translator error has occurred.

### **Unrecognized B2 Record**

OPTLINK found a type B2 record in its input files and was unable to determine the meaning of the record. Most likely cause is that the translator has added an undocumented extension to the B2 record usage.

**Unrecognized Communal Syntax**

OPTLINK detected an error while processing a type B0 (Communal Data) record.

**Unrecognized Record**

OPTLINK cannot recognize the type of a record in an object file.

**User ABORT**

The user pressed Control-C or Control-Break to abort the link operation.

**XMS Error**

OPTLINK was notified of an XMS error while attempting to access extended memory. The only known causes for this error are faults in the XMS driver.

## SMAKE Error Messages

This section lists and describes error messages produced by the SMAKE utility.

When SMAKE encounters an error, it prints a message to the screen describing the error and then returns to the operating system.

SMAKE error messages begin with the text "SMAKE fatal error:" followed in most cases by the name of the makefile and the current line number in the makefile, followed by one of the messages described below.

### **access denied**

DOS could not perform the action specified in a command block.

### **can't create response file** *filename*

SMAKE could not find or open response file *filename* as specified on the command line (using the @ option).

### **can't create temporary file** *filename*

SMAKE could not create the temporary file *filename*.

### **can't execute command**

In a command block, the specified (DOS) command could not be executed.

### **can't nest response file**

SMAKE was passed a response file (using the @ option) that included another @ command.

### **can't open error file** *filename*

SMAKE could not open the error file *filename*.

### **can't open include file** *filename*

SMAKE could not open the #include file *filename*.

### **can't open makefile** *filename*

SMAKE could not open the makefile *filename*.

### **can't reopen** *filename* for input

SMAKE could not reopen the makefile *filename* after closing a #included file.

### **command** *expression* returned with error code *number*

In a command block, the command *expression* failed; it returned error code (ERRORLEVEL) *number*.

### **directory not found**

In a command block, the specified (DOS) directory was not found.

### **don't know how to make** *filename*

SMAKE did not have enough information to make target *filename* based on the makefile.

### **error in macro substitution syntax:** *identifier*

The macro *identifier* uses internal substitution (for example, \$(XYZ:a=b) incorrectly.

### **exceeded max nesting level for conditionals**

Conditional directives (for example !IF) within the makefile were nested greater than 32 levels deep.

### **extension** *ext* too long in rule

In a rule, SMAKE encountered a file extension *ext* that was too long.

### **file not found**



In a command block, the external (DOS) command was not found.

**illegal operator and/or operand in expression**

A conditional expression was not written properly.

**illegal string expression**

On the specified line, a string expression within a conditional statement used invalid syntax.

**invalid option** *number* in parameter *number*

The *number* th option in the *number* th parameter on the SMAKE command line was invalid.

**invalid parameter** *number*

The *number* th parameter on the SMAKE command line was invalid.

**not enough memory for command**

In a command block, there was not enough memory to execute the specified (DOS) command.

**out of memory**

SMAKE could not allocate enough memory to continue.

**parameter** *number* requires a filename

The *number* th parameter on the SMAKE command line requires a file name argument.

**special macro** *expression* is undefined in this context

The predefined macro *expression* was used incorrectly.

**syntax error:** *expression*

On the specified line, *expression* contained a syntax error.

**text found after !ELSE**

SMAKE encountered text on a line following a !ELSE directive.

**too many rules or blocks for target** *filename*

Target *filename* was associated with too many rules or blocks.

**unexpected directive**

SMAKE encountered an invalid conditional directive (one beginning with a ! character).

**unknown error**

An unexpected error occurred.

**unknown error** *number* executing command

In a command block, a command returned an error code *number* that SMAKE could not interpret.

**unmatched quotes in command** identifier filename

SMAKE was passed a response file (specified using @) that contained unmatched double quotation marks (").

## SMAKE Overview

SMAKE lets you automate program maintenance, instead of typing in commands to compile and link your program. You create a makefile, which describes how all the files in your project depend on each other and how to update a file (such as an object file) when the files it depends on (such as source files) change.

SMAKE is particularly useful for programs that have many source files, since it recompiles only those source files that have changed. It does this by looking at the date and time stamp of each relevant file before performing any tasks.

**Note:** When you use SMAKE, always be sure your PC displays the correct date and time. Be especially careful when logging on to networks that change the time on the local machine, in case the network time is incorrect.

SMAKE differs from a batch file in that it performs only the commands required to rebuild your program, while a batch file executes all tasks, whether or not they are necessary.

## Writing Makefiles

A makefile is a text file that tells SMAKE how to build your program. By default, SMAKE expects the makefile to be named `MAKEFILE`, with no extension. However, makefiles can have any valid extension (for example `.mak`).

The makefile contains one or more dependence lines, each followed by one or more command lines. Each dependence line specifies a target (upon which the associated command lines act), followed by a colon and a (possibly empty) list of dependent files (files needed to create the target). For example, this dependence line:

```
app.exe : app.obj app.res app.def
```

tells SMAKE to perform the commands that follow if any of `app.obj`, `app.res`, or `app.def` have a more recent date and time than `app.exe`.

Command lines tell SMAKE how to create the target. Command lines must begin with a tab or space character. For example:

```
app.exe : app.obj app.res app.def
    link app, ,NULL, lib, app
    rcc app.res app.exe
```

tells SMAKE to run the linker and the resource compiler.

A makefile can also contain comments, macros, preprocessing directives, operating system commands, and inference rules.

## Example of a Simple Makefile

This makefile creates a program that has only one source file.

```
hello.exe: hello.obj          # Dependence line 1
           link hello.obj      # Command line 1
hello.obj: hello.cpp          # Dependence line 2
           sc -c hello.cpp     # Command line 2
```

**Note:** You can put comments in your makefile. A comment begins with the # character and continues until the end of the line.

The first dependence line indicates that `hello.exe` depends on `hello.obj`. The first command line specifies how to make `hello.exe` by executing `link hello.obj`.

The second dependence line indicates that `hello.obj` depends on `hello.cpp`. The second command line specifies how to make `hello.obj` by executing `sc -c hello.cpp`.

Suppose you just finished editing `hello.cpp` and typed `smake` to create a new version of your program. SMAKE reads the dependence lines in your makefile. It notices that `hello.cpp` is newer than `hello.obj`, so it re-creates `hello.obj` by executing `sc -c hello.cpp`. Then it notices that `hello.obj` is now newer than `hello.exe`. It re-creates `hello.exe` by executing `link hello.obj`.

## Makefile Syntax

**See Also**

The syntax for a basic makefile is:

```
target-file : dependent-file1 dependent-file2 ...
    command 1
    command 2
    . . .
```

SMAKE assumes that if a target file is older than any of the files needed to create it, then it must re-create the target file by executing the command lines that follow the dependence line.

Target files are typically executable files or libraries, but they can also be labels for sets of commands (like `all`); these are often called pseudo-targets. Similarly, a dependent file is usually a C or C++ source file, but can be a pseudo-target. For more information see "Specifying targets."

**Note:** SMAKE reads all the dependence lines in a makefile before executing any of the associated commands. It then compares the date and time of the dependents to the target and executes the commands for any target that is out of date. It also checks to see if that target has other dependents that might be more recent.

**See Also**

[Specifying What Targets to Build](#)

## Dependence Line Syntax

The name of the target file must be the first thing on the dependence line, with no white space preceding it. The target and subsequent dependents are separated by a single colon, which can optionally be preceded by tabs or spaces. A dependence line can span multiple lines; all lines to be continued must end with a backslash (\) character.

### Specifying targets

The dependence line can contain one or more target names separated by one or more spaces. Each target can be a fully qualified path and file name, or just a label. However, if the last target has a single character name (with no extension), at least one space is required before the colon to distinguish it from a drive letter.

To build a complicated target that requires more than one set of dependence lines and commands, use double colons (::) to separate it from the dependents in each case. For example:

```
app.exe :: app.obj app.def
    link app, , NULL, lib, app
app.exe :: app.res
rc app.res app.exe
```

If the same target, followed by a single colon, appears on two consecutive lines, and commands follow only one of those instances, SMAKE interprets this as a single, cumulatively combined dependence line. For example:

```
target.exe : file_1.obj
target.exe : file_2.obj
# is interpreted as
# target.exe : file_1.obj file_2.obj
```

If the same target, followed by a single colon, appears on two different lines in various places in the makefile, and commands follow only one of those instances, SMAKE interprets this as if the dependence lines were adjacent. This means that SMAKE does not apply an inference rule (see "Inference Rules") to the instance without commands. Use double colons (: :) after the target to avoid this side effect.

If a target is not specified on the SMAKE command line, SMAKE uses the first target it encounters in the makefile. SMAKE always interprets a label used as a target name as being out of date; this is useful to avoid having to pass several targets on the command line. For example:

```
all: app.exe app2.exe app3.exe
```

### Specifying dependent files

The names of zero or more dependents can follow the target on the dependence line. As with targets, a dependent can be a fully qualified path name or a label, although it is usually a file that is used to build the target. Multiple dependents must be separated by one or more spaces or tabs.

A search path can precede a dependent file; enclose the path in curly braces ({} and separate the directories with semicolons (;). SMAKE will search the specified directories in order for the dependent. (The search path applies only to the dependent it proceeds.) For example:

```
app.exe : app.obj app.res \
    {c:\project;c:\default} app.def
```

## Special Characters in Makefiles

SMAKE accepts the special characters listed below in makefiles. These characters have special meaning depending on their context.

For any of these characters to be interpreted literally in a makefile, you must precede it with a caret (^) character. If ^ appears in front of a character that does not have special meaning to SMAKE, it is interpreted literally.

**Note:** You can use ^ at the end of a line to include a carriage return/line feed sequence in a macro or string.

### Special characters in makefiles

Character	Meaning
:	Separates target from rest of dependence line.
#	All characters following a # on a line are interpreted as a comment and ignored.
()	Encloses the value string of a macro to be expanded.
\$	Precedes an instance of a macro to be expanded.
^	The next character is interpreted as a literal character.
\	Continues a line on the next line.
{ }	On a dependence line, encloses a path name associated with a dependant.
!	As the first character on a line, recognized as the start of a preprocessing directive. On a dependence line, acts as a command modifier.
@	On a dependence line, acts as a command modifier.
-	On a dependence line, acts as a command modifier.

### Using % and \$ in commands

SMAKE interprets a percent sign (%) as the beginning of a file name specifier. To place a percent sign in a command, use two percent signs (%%). Similarly, to use a dollar (\$) sign in a command, specify two consecutive dollar signs (\$\$). You can also specify multiple literal % and \$ characters this way. For example, SMAKE interprets \$\$\$\$ in a command as two consecutive dollar signs.

Because SMAKE interprets the \$ and @ symbols as special characters, it is recommended that you do not use these symbols in file or directory names that will be processed by SMAKE.

### Comments in makefiles

SMAKE interprets all characters following a # on a line as comment characters, and ignores them. Comments need not start at the beginning of a line; they can appear almost anywhere, including at the ends of lines defining macros, dependence lines, and inference rules. Comment are also permitted in command blocks, but cannot be on the same line as the command itself, even if the command spans multiple lines.



## Running SMAKE

When you run SMAKE (from an operating system command prompt), it prints your commands as it executes them. If you run SMAKE and it doesn't need to update your files, it lets you know like this:

```
Target is up to date
```

You can redirect the output of SMAKE with the greater-than sign, like this:

```
SMAKE > log
```

**Note:** When SMAKE calls another program, it redirects that program's output to the log file only if that program writes to `stdout`. The tools that come with Symantec C++, such as SC and OPTLINK, write to `stdout`.

## SMAKE Command Line Syntax and Command Options

### SMAKE Command Line Syntax

The syntax for the SMAKE command is:

```
SMAKE {options} {macros} {targets}
```

The command line arguments for SMAKE are:

### SMAKE command line arguments

Argument	Description
options	Zero or more command line options used to control the current SMAKE session. If no options are specified, SMAKE uses the options specified in the <code>tools.ini</code> file. If a required option is not specified, SMAKE uses the default value for that option specified in <code>tools.ini</code> .
macros	One or more macros of the form <code>macro=text</code> . A macro defined on the command line overrides any corresponding macro definition in the makefile.
targets	The targets to build.

### Command line options

SMAKE options are preceded by either a dash (-) or slash (/). Case is irrelevant when specifying options. If a required option is not specified, SMAKE uses the default value for that option specified in `tools.ini`. The following options are valid:

### SMAKE command line options

Option	Description
/A	Rebuilds all targets, including targets that are not out of date with respect to their dependents. Unrelated targets will not be rebuilt. See also /B, below.
/B	Rebuilds a target if its date and time are identical to the date and time of the dependent. Because most operating systems assign file date and time stamps to a resolution of two seconds, commands that execute very quickly might not result in a different date and time between a target and its dependent. Therefore, SMAKE might conclude that a target is current when it is not. Though this option can result in unnecessary build steps, it is recommended for use on very fast systems. See also /A, above.
/C	Suppresses the default SMAKE output, which includes any nonfatal error messages, warning messages, date and time information, as well as the SMAKE copyright message. If both the /C and the /K options are specified, /C suppresses the warnings issued by the /K option. See also /K.
/D	Displays extra information during the SMAKE session. SMAKE displays the date and time of each target and its dependent when they are evaluated during the build, and outputs a message when a target does not yet exist. The names of the dependents for a target precede the target itself, and are indented. The /D, /N, and /P options are

useful for debugging makefiles. See also /N, /P.

- /E Causes the settings for environment variables to override the macro definitions within the makefile.
- /F *filename* Specifies *filename* as the name of the makefile to be used. White space consisting of zero or more spaces or tabs can precede the *filename*. Using a dash (-) instead of a filename causes SMAKE to get the makefile input from the standard input device. Keyboard input is then ended by typing either F6 or Ctrl-Z. SMAKE can accept more than one makefile; use a separate /F specifier for each makefile. If /F is omitted, SMAKE obtains its input from the file MAKEFILE.
- /HELP /? Displays a brief summary of the SMAKE command line syntax.
- /I Ignores exit codes from all commands processed by SMAKE. To ignore errors for unrelated parts of the build, use the /K option; /I overrides /K if both are specified. See also .IGNORE, /K.
- /K Continues building unrelated parts of the dependencies, even if a command terminates with an error. SMAKE normally stops processing if any command returns a non-zero exit code. /K allows SMAKE to continue processing any unrelated targets (those which do not depend on the results of the current command). If an error is encountered, SMAKE returns an error code of 1, unlike the /I option which ignores all exit codes. /I overrides /K if both options are specified. Also, /C suppresses the warnings issued by /K. See also /C, /I.
- /N Displays but does not execute the commands that SMAKE would have executed. However, any preprocessing commands (*.directive*, *!directive*) are executed. Use /N to determine which targets are out of date. The /N, /D, and /P options are useful in debugging makefiles. Note that /N does not automatically recurse to subsequent calls to SMAKE. See also /D, /P.
- /NOLOGO Suppresses the SMAKE copyright message.
- /P Displays SMAKE information to the standard output device before processing begins. This includes all macro definitions, inference rules, and target descriptions, as well as the .SUFFIXES list. Specifying /P without a makefile or command line target causes SMAKE to display its information without issuing an error. The /P, /D and /N options are useful for debugging makefiles. See also /D, /N.
- /Q Checks the dates and times of targets that SMAKE would have updated, but does not update any files; only the preprocessing commands (*.directive*, *!directive*) are executed. A non-zero exit code is returned if any target is not up to date. Note that /Q does not automatically

recurse to subsequent calls to SMAKE.

- /R** Clears the .SUFFIXES list and ignores the default tools.ini settings.
- /S** Suppresses the display of all commands executed by SMAKE. See also .SILENT, @.
- /T** Changes the dates and times of the command line targets to the current date and time and executes the preprocessing commands, but does not process the normal target commands. If a command line target is not passed, SMAKE changes the date and time of the first target in the makefile. The contents of the target files are not changed, only the date and time stamp is updated.
- /X filename** Sends all SMAKE error output to *filename*. This can be either a file or a device. White space consisting of zero or more spaces or tabs can precede *filename*. Using a dash (-) instead of a filename causes SMAKE to send the error messages to the standard output device. SMAKE normally sends any error messages to the standard error device. This option only affects the SMAKE output, and not the output of any command executed by SMAKE.
- @command** A *command* file can be used to pass command line options to SMAKE. SMAKE first attempts to interpret command as an environment variable. If it does not exist, SMAKE attempts to open a linker response file with that name. The *command* file name must be preceded by the @ character, with no white space separating the @ character from the file name. Use of a *command* file also permits a command sequence longer than the 128 character limit imposed by DOS. The *command* file options can be placed on a single line separated by white space, or on multiple lines. If multiple lines are used, carriage return/line feed sequences are replaced by spaces when the lines are concatenated into a full command. Macro definitions can be continued on multiple lines by putting a backspace (\) character at the end of the lines that are to be continued.

**Note:** You can change any command line option except /E, /HELP, /?, or /NOLOGO from within a makefile with the !CMDSWITCHES directive.

## Specifying What Targets to Build

Usually SMAKE creates the first target that it finds in your makefile. However, if you specify a target on the command line, SMAKE creates that target instead.

For example, this makefile creates several utility programs:

```
all: count.exe write.exe read.exe
```

```
count.exe: count.c
           sc count.c
```

```
write.exe: write.c
           sc count.c
```

```
read.exe: read.c
          sc read.c
```

If you want to create all the targets, don't specify a target on the command line. In the example above, SMAKE encounters the target `all` first. Since the dependency list for `all` contains the executables for all the utilities, SMAKE creates all the utilities.

If you want to create just some targets, specify them on the command line. For example, this command creates the programs `write.exe` and `read.exe`:

```
smake write.exe read.exe makefile
```

If you want SMAKE to build a target only when you specify the target on the command line, make sure that target has no dependencies and is not the first target in the makefile. Such a target can delete files you no longer need or install software you just created. For example, suppose the makefile above ends with this target:

```
clean:
       del *.obj
```

If you type only `SMAKE`, SMAKE does not perform this target's command. But if you type `SMAKE clean`, SMAKE performs only this target's command and exits.

## Choosing Dependency Files

Since you use dependency files to create the target file, the names of the dependency files usually appear in the command lines that follow the dependence line. But if an object file depends on a source file and that source file includes a header file, the object file depends on that header file. If that header file changes, you must recompile the source file to create a new object file. It can be useful to include these kinds of files in dependency lists.

Suppose that `hello.cpp` includes the file `hello.h`. The dependence line for `hello.obj` looks like this:

```
hello.obj : hello.cpp hello.h
```

If a header file isn't likely to change, omit it from the dependency list. For example, system header files are unlikely to change. System header files include header files for standard libraries, such as `stdio.h`, and header files for operating system functions, such as `windows.h`.

## Producing Dependency Lists with MAKEDEP

The MAKEDEP utility produces dependency lists that you can use in your makefiles. MAKEDEP commands have the following form:

```
MAKEDEP [-d] {-ipath} [-m] [-s] [-t]
        {-xexclude} filenames . . .
```

where:

Argument	Description
-d	Prints debugging output
-ipath	Specifies a search path for header files
-m	Include files that are referenced in <code>#include</code> statements, but do not actually exist. By default, MAKEDEP only includes files that exist.
-s	Doesn't list system include files as dependencies (that is, header files enclosed in less-than and greater-than signs, such as <code>#include &lt;stdio.h&gt;</code> )
-t	Do not include path names in generated targets
-xexclude	Specifies a directory to exclude from the search path. Any path of which this directory is a part will be excluded.
filenames . . .	A list of filenames, separated by spaces, for which dependency lists are to be created

You can redirect the output of MAKEDEP to a file that you can use as the starting point for a makefile, like this:

```
makedep -s menu.cpp wbase.cpp > makefile
```

The makefile looks like this:

```
menu.obj : wbase.h menu.h menu.cpp
wbase.obj : wbase.h wbase.cpp
```

## **Including Files**

You can include files in makefiles by adding an include statement to a makefile command line, like this:

```
!include filespec
```

The !include statement lets one makefile support several configurations of a program. You can use SET commands to set environment variables for executed programs in the included file.



## Defining Macros

**See Also**

SMAKE lets you define macros--identifiers that are replaced with text you specify. By combining the macros in a makefile with macros in `tools.ini` (see "Customizing SMAKE Sessions with `tools.ini`"), you can use a single makefile for multiple projects. Macros are useful for specifying compiler options, paths for targets, dependents, and inference rules.

You define a macro by putting a line with the following syntax in your makefile, in `tools.ini`, or on your SMAKE command line:

```
macro = value_string
```

macro is a case sensitive combination of up to 1024 letters, digits, and underscore (`_`) characters. If a macro is to be used as a command, it cannot be null or undefined.

The `value_string` can be any sequence of characters, including no characters, or white space (interpreted as a null string). It includes all the text between the equals sign and the end of the line. Note that a macro defined as a null string is not equivalent to an undefined macro; it is still defined in relation to directives like `!IFDEF` and `!IFNDEF`.

To specify an instance of a macro that is to be expanded, enclose the macro name in parentheses and put a dollar sign in front of it, like this:

```
$(macro)
```

If a macro name is only a single character, the parentheses are not required.

**See Also**

[Customizing SMAKE Sessions with tools.ini](#)

## Examples of When to Use Macros

Macros are especially useful for defining frequently repeated text. For example, if you need to make sure that all your source files are compiled with the same compiler options, define a macro that contains those options, like this:

```
FLAGS = -c -g -DDEBUG=1 -ml
```

```
file1.obj: file1.cpp file2.h  
    sc $(FLAGS) file1.cpp
```

```
file2.obj: file2.cpp  
    sc $(FLAGS) file2.cpp
```

If you need to refer frequently to the same directory path, put the path in a macro, like this:

```
MYLIB = c:\dev\lib
```

```
prog.exe: prog.obj $(MYLIB)\mylib.lib  
    sc prog.obj $(MYLIB)\mylib.lib
```

## **Comments in Macros**

A hash character (#) on a line that defines a macro starts a comment. To use a # as part of a macro name, precede it with a caret (^). To continue a macro definition on another line, end the first line with a backslash (\). To specify a literal backslash at the end of a line, as for a directory name, precede the \ with a caret. You can use a carriage return as part of a macro name by preceding the carriage return with a ^; this also continues the macro on the next line.

## Specifying Text to Be Substituted

You can specify text to be substituted when an instance of a macro is expanded by including a colon (:) followed by the string to be substituted for, an equal sign (=), and the string to substitute. For example:

```
MODEL=L           # defines macro
$(MODEL)         # instance to be expanded
$(MODEL:L=S)     # expands 'L' to 'S'
```

The substitution applies only to the current instance, not to the original macro definition. Do not put white space characters before the colon; white space after the colon is interpreted as part of the string to be substituted. The text to be substituted is case sensitive.

## Overriding Macros on the Command Line

You can override the macros defined in a makefile or `tools.ini` by specifying a new definition on the SMAKE command line. For example, to override the definition of `MYLIB` in the example above, enter a command like this:

```
smake MYLIB=c:\dev\test\lib
```

You can also refer to macros that you define in the environment with the operating system command `SET`. For example, if you define `temp` with this command:

```
set temp = c:\dos
```

you can refer to it like this:

```
test.obj: test.cpp
    sc -cod$(temp)\test.cod test.cpp
```

If you define a macro in more than one place, SMAKE chooses definitions in this order of priority:

1. Definitions on the command line
2. Definitions in the makefile
3. Definitions in the environment (specified using the `SET` command)

**Note:** If a macro is to be passed on the command line, double quotation marks (") must surround any part of its definition that contain spaces. This is true not only for spaces that are part of the macro's value string, or even for spaces that appear on either side of the equal sign (=) that separates the macro's name from its value string.

## Recursively Defined Macros

Ordinarily, macros are defined only for the current SMAKE session or iteration. The only macros that are defined recursively in calls to SMAKE from within a makefile are:

- Macros specified on the command line
- Macros predefined by environment variables
- One of the macros MAKE, MAKEDIR, or MAKEFLAG

Macro	Description
MAKE	The name of the executable specified on the SMAKE command line. The default is SMAKE.
MAKEDIR	The current directory when SMAKE was called.
MAKEFLAG	The current SMAKE options (you can change these with the !CMDSWITCHES directive).

## Predefined Macros

SMAKE supports the following predefined macros, which you can use in your makefile:

Macro	Description
\$?	Lists dependencies that are newer than the target.
**	Full list of dependents of the current target.
*	Current target's name and path, without the extension.
<	The dependent file that is newer than the target. This macro is only valid within commands in inference rules.
@	The current target's fully qualified path name.
\$\$@	The current target's fully qualified path name. This macro is valid only for specifying a dependent on a dependence line.
\$\$	Expands to \$.

### Modifiers for predefined macros

You can use the following filename modifiers in combination with the predefined macros listed above:

#### Filename modifiers for use with predefined macros

Modifier	Description
B	Base file name
D	Drive and directory
F	Base name and extension
R	Drive, directory, and base name

For example, for the file `c:\project\app.exe`:

```
$(@D) refers to c:\project
$(@F) refers to app.exe
$(@B) refers to app
$(@R) refers to c:\project\app
```

### Predefined command and option macros

`tools.ini` predefines macros that correspond to commands and command options. The option macros are undefined by default. You can define these macros to expand to the commands and options you want to pass to the compiler and tools. (See `tools.ini` for a list of definitions.)

#### Predefined command and option macros

Macro	Description
-------	-------------

AS	Command to run the Microsoft Macro Assembler
CC	Command to run the Symantec C Compiler
CPP	Command to run the Symantec C++ Compiler
CXX	Command to run the Symantec C++ Compiler
RC	Command to run the Symantec Resource Compiler
AFLAGS	Options for the Microsoft Macro Assembler
CFLAGS	Options for the Symantec C Compiler
CPPFLAGS	Options for the Symantec C++ Compiler
CXXFLAGS	Options for the Symantec C++ Compiler
RFLAGS	Options for the Symantec Resource Compiler

#### **Macros for predefined environment variables**

In addition to the predefined macros listed above, every environment variable that is defined when SMAKE starts up is equivalent to a predefined macro. This can cause unexpected results if the value of an environment variable used as a macro contains a \$ character, because SMAKE interprets \$ as the beginning of a macro invocation.



## Macro Precedence

The order of precedence for macros in SMAKE sessions is:

1. Macros defined on the command line
2. Macros defined in a makefile or include file
3. Macros that correspond to predefined environment variables
4. Macros defined in `tools.ini`
5. Macros that correspond to commands or command options, like `CPP` or `CPPFLAGS`

## Using Operating System Commands

Command lines that follow dependence lines, as well as inference rules, can contain any command that is valid on the command line. SMAKE runs these commands when a target is out of date. You can specify multiple commands by putting each command on its own line. If there are no commands following a dependence line, the dependency is checked against the inference rules.

A command line must begin with one or more spaces or tabs, and must immediately follow the dependence line. No blank lines can separate them; however, a line containing only white space can be used to specify a null command. Blank lines can appear within a list of commands. You can continue commands by ending the line to be continued with a backslash (\). If any characters, including spaces or tabs, follow the backslash, SMAKE interprets them literally. You can place single commands at the end of a dependence line by separating the dependency from the command with a semicolon (;).

To let SMAKE know how to execute a command line, precede a command with any of the following modifiers. More than one modifier can be used with a command:

### Modifiers for SMAKE commands

Modifier	Description
-	Tells SMAKE to ignore the exit status from a command; processing continues no matter what value the command returns. Otherwise, SMAKE stops executing if a command returns an error.
-N	Tells SMAKE to halt execution only if the exit status a command returns is greater than the number N (even if .IGNORE or /I are not being used). Otherwise SMAKE halts when a command returns a non-zero exit code.
@	Tells SMAKE not to display a command when it is executed, even if /S or .SILENT are not specified. Otherwise, SMAKE displays commands as they are executed.
!	Executes a command for each of the dependents in the dependency list. The command must use one of the file name macros \$** or \$?, or the ! prefix is ignored. \$** causes the command to be executed for all of the dependent files. \$? causes the command to be executed only for those dependent files which are more recent than the target.
*	Allows SMAKE to accept long command lines. Causes all arguments to be assigned to the temporary variable \$MAKE\$, and all arguments to be replaced with @\$MAKE\$.
<<file	Specified after a command. If file is specified it must appear immediately after the angle brackets (<<), with no white space. If file is not specified, SMAKE uses a unique filename. Tells SMAKE to use inline files when processing a command. The file is created from the literal text beginning on the line immediately following the angle brackets. You end the inline file by beginning a line with <<. Optionally, you can write one of the modifiers KEEP or NOKEEP immediately after the closing <<. NOKEEP (the default) tells SMAKE to delete file at the end of the session. KEEP tells SMAKE not to delete file at the end of the session (though file will be overwritten

each time it is used).

For example, in the makefile fragment below, SMAKE continues even if the RM command returns an error, and SMAKE executes the PROG command with `command.com` so you can use I/O redirection (with the greater than symbol `>` in this case):

```
install:
    -rm \bin \prog
```

SMAKE always executes the commands in the table below by calling the operating system. You don't need to use the `+` modifier when you specify these commands.

break	cd	chdir	cls	copy
ctty	date	del	dir	echo
erase	exit	if	md	mkdir
pause	rd	rem	rmdir	ren
rename	time	type	verify	vol

**Note:** SMAKE handles `del` commands itself, unless they are followed by a file specification containing wildcard characters. This allows you to specify a command like

```
del $(OBJS)
```

where `OBJS` is a macro that expands to a list of file names.

## Preprocessing Directives

Preprocessing directives are commands for SMAKE. SMAKE processes these directives before it processes dependency lines and commands. You can place preprocessing directives in makefiles or in `tools.ini`.

There are two types of preprocessing directives:

- Directives that begin with an exclamation point (!) work like C preprocessing directives. The ! must be the first character the line; it can be followed by white space. ! directives are not case sensitive.
- Directives that begin with a period (.) and end with a colon (:) cannot appear among dependency lines and commands. They must begin the line on which they appear, and are case sensitive.

## ! (Exclaim) Preprocessing Directives

SMAKE supports these ! preprocessing directives:

### ! preprocessing directives

Directive	Description
! CMDSWITCHE S {+/-} <i>opt</i>	Turns on or off one or more command line options with the exception of /F, /HELP, /NOLOGO, /X, or /?. In the makefile, only the /D, /I, /N, and /S options are valid, though <code>tools.ini</code> can contain the others.
!ELSE	If the preceding <b>!IF</b> , <b>!IFDEF</b> or <b>!IFNDEF</b> evaluated to zero, the statements between the <b>!ELSE</b> and the next <b>!ENDIF</b> are processed. An additional <b>IF</b> , <b>IFDEF</b> or <b>IFNDEF</b> can be combined on the same line.
!ELSEIF	Equivalent to the <b>!ELSE IF</b> directives.
!ELSEIFDEF	Equivalent to the <b>!ELSE IFDEF</b> directives.
!ELSEIFNDEF	Equivalent to the <b>!ELSE IFNDEF</b> directives.
!ENDIF	Marks the end of a block beginning with an <b>!IF</b> , <b>!IFDEF</b> , or <b>!IFNDEF</b> directive.
!ERROR <i>text</i>	Stops the SMAKE session with a fatal error, followed by the <i>text</i> . This directive will stop the session even if other options, directives or command modifiers, such as /K, /I, .IGNORE, or -, are being used.
!IF <i>expression</i>	If the <i>expression</i> evaluates to other than zero, the statements between the <b>!IF</b> and the next <b>!ELSE</b> or <b>!ENDIF</b> are processed. See "Expressions in preprocessing directives" for information.
!IFDEF <i>macro</i>	If the <i>macro</i> is defined, even with a null value, the statements between the <b>!IFDEF</b> and the next <b>!ELSE</b> or <b>!ENDIF</b> are processed.
!IFNDEF <i>macro</i>	If the <i>macro</i> is not defined, the statements between the <b>!IFNDEF</b> and the next <b>!ELSE</b> or <b>!ENDIF</b> are processed.
!INCLUDE < <i>filename</i> >	Reads and evaluates the <i>filename</i> and continues the SMAKE session. If angle brackets (<>) are used, the directories in the <b>INCLUDE</b> macro is searched to locate the <i>filename</i> . If angle brackets are not used, the current directory or the specified path is searched to locate the <i>filename</i> . For compatibility with NMAKE and Symantec MAKE, you can specify this directive without the ! prefix.
!MESSAGE <i>text</i>	Writes the <i>text</i> to the standard output and continues the SMAKE session.
!UNDEF <i>macro</i>	Removes the <i>macro</i> from the SMAKE symbol

table.

**See Also**

[Expressions in Preprocessing Directives](#)

## . (Period) Preprocessing Directives

SMAKE supports these . preprocessing directives:

### . preprocessing directives

Directives	Description
.IGNORE	Directs SMAKE to ignore exit codes from all the commands it processes from this point to the end of the file. You can also use <b>!CMDSWITCHES +/I</b> . See also /I, -, <i>-number</i> .
.LONGCOMMAN DLINE: <i>tools</i>	Permits longer command lines. <i>tools</i> is a list of one or more executable program names, with no path or extension. Multiple occurrences of .LONGCOMMANDLINE are cumulative. If <i>tools</i> is not specified, the current list is cleared. Any tool on the <i>tools</i> list whose name appears in the makefile has its command line arguments passed in a temporary environment variable. For example: .LONGCOMMANDLINE:sc link lib
.PRECIOUS : <i>targets</i>	Tells SMAKE not to delete the <i>target</i> if the command to make it is interrupted. If a command is interrupted with a CTRL+C or CTRL+BREAK, SMAKE deletes the <i>target</i> by default. Making a <i>target</i> .PRECIOUS: will make the target immune to deletion across the entire makefile, not just a portion of it.
.SILENT	Disables the display of command lines before they are executed. You can also use <b>!CMDSWITCHES /S</b> . See also /S, @.
.SUFFIXES : <i>lis</i>	Provides a list of file name suffixes for SMAKE to use when applying inference rules. The predefined list (as defined in <code>tools.ini</code> ) contains: <code>.exe .obj .asm .c .cpp .cxx .res .rc</code> .  Additional suffixes can be added by using <b>.SUFFIX</b> ; separate each suffix in the list with white space, one or more spaces, or tabs. To clear the suffix list, specify <b>.SUFFIX</b> without any suffixes. See also /P.

## Expressions in Preprocessing Directives

The !IF and !ELSE IF directives use the result of an expression, which is evaluated when these directives are encountered. This expression can consist of any combination of string constants, integer constants, or the names of external programs to be run.

You can group subexpressions by enclosing them in parentheses. Any constant string in an expression must be enclosed in double quotation marks (""), even if it is a macro. Quoted strings can be compared using the equality (==) or inequality (!=) operators.

Numeric values are treated as signed long integers. Numbers are assumed to be decimal values. Octal values must start with 0; hexadecimal values must start with 0x. Constant expressions can use any binary operators (see below); the integer constants can also use the unary operators.

An expression can also consist of the name of an external program, enclosed in square brackets ( []). The program

will be executed during the preprocessing phase of makefile processing, and that portion of the expression will be replaced by an integer value equal to the error level returned by the executed program.



## Operators in Makefiles

You can use the following operators in expressions:

### Operators used in SMAKE expressions

Operator	Description
DEFINED ( <i>macro</i> )	Unary operator that evaluates to TRUE if the <i>macro</i> is defined. The expression <b>!IF DEFINED</b> ( <i>macro</i> ) is equivalent to the expression <b>!IFDEF</b> <i>macro</i> .
EXIST( <i>path</i> )	Unary operator that evaluates to TRUE if the <i>path</i> exists. Some operating systems allow spaces within the path name. If a space is used, the <i>path</i> must be surrounded by double quotation marks (").
+	Addition
-	Subtraction
*	Multiplication
/	Division
==	Equality
!=	Inequality
>	Greater than
>=	Greater than or equal to
<	Less than
<=	Less than or equal to
&	Bitwise AND
	Bitwise OR
^	Bitwise XOR
&&	Logical AND
	Logical OR
<<	Left shift
>>	Right shift
%	Modulus

## Running Programs with Preprocessing Directives

When you run a program with a SMAKE preprocessing directive, you typically obtain and test its exit code and execute other commands based on the result. For example:

```
!if [c:\mydir\myprog] == 0
# continue processing
!else
# do something else
!endif
```

If you use macros as part of the command line, SMAKE expands them before running the program.

## **Inference Rules Overview**

You can define rules that tell SMAKE how to automatically create certain types of files. For example, you might define rules that tell SMAKE how to create an object file (`.obj`) from a C++ source file (`.cpp`) and how to create an executable file (`.exe`) from an object file (`.obj`). By defining inference rules, you reduce the number of actions you must explicitly specify.

SMAKE interprets inference rules as templates for creating a target from dependent files, based on the extensions of the files involved. You can use predefined inference rules or write your own; they can be specified in the makefile or in `tools.ini`.

To determine priorities for applying inference rules, SMAKE uses the list associated with the **.SUFFIXES** directive.

## **When SMAKE Applies Inference Rules**

SMAKE applies inference rules when:

- A dependence line does not contain any dependents or is not followed by any commands
- A target is specified that does not exist in the makefile (or the makefile does not exist).
- A dependent file does not exist and is not itself a target.

## Inference Rule Syntax

The dependence line for an inference rule contains the source file extension, the destination file extension, and a colon. Inference rules have the following syntax:

```
{dependent_path}.dependent_ext{target_path}target_ext:  
  commands
```

where `dependent_path` is the path for the dependent file and `dependent_ext` its extension, and `target_path` is the path for the target and `target_ext` its extension. If no paths are specified, SMAKE looks for the files in the current directory. `commands` are the steps SMAKE will take if the dependent file is out of date.

You can use macros for paths and extensions. Use the macros in Table 13-4 to specify the arguments. Do not use white space in an inference rule.

For example, this rule builds an object file from a C++ file:

```
.cpp.obj :  
    sc -c $*          # $* contains the name of  
                    # the target file without  
                    # an extension
```

A simple makefile can use inference rules to create a program from two source files, such as:

```
.cpp.obj  
    sc -c $*  
  
.obj.exe  
    sc $**  
  
test.exe: test.obj util.obj  
  
test.obj: test.cpp util.h  
  
util.obj: util.cpp
```

### Levels of inference rules

SMAKE can interpret no more than one level of inference rules. For example, this makefile does not produce an executable:

```
.c.obj: ;sc -c $  
.obj.exe: ;sc $  
hello.exe: hello.c          # ERROR
```

## How Inference Rules Work

Inference rules work on targets and dependents with the same file name and different extensions; they do not match multiple files. For example, you can specify an inference rule to build `myprog.obj` from `myprog.cpp`, but not `yourprog.obj` from `myprog.cpp`.

For example, given this inference rule:

```
.cpp.obj:
    $(CPP) $(CPPFLAGS) $<
```

SMAKE will apply this rule to any pair of target/dependency files in the current directory (or on the specified path) that have the same name, where one has the extension `.cpp` and the other `.obj`. SMAKE will expand the predefined macros and run the resulting commands on those dependents that are newer than their corresponding targets (as specified by `$<`).

If the target specified has a `.exe` extension, SMAKE searches for a file with the same base name and an extension that is in the **.SUFFIXES** list to find which inference rule to use.

If the dependence line is followed by commands but does not list dependents, SMAKE will use the inference rules and the **.SUFFIXES** list to determine the dependent file and then apply the commands specified in the makefile for the target.

### Order of precedence for inference rules

SMAKE determines the precedence of inference rules as follows:

- | Order | Inference Rule                                                    |
|-------|-------------------------------------------------------------------|
| 1     | Defined in a makefile; the latest defined inference rule applies. |
| 2     | Defined in the <code>tools.ini</code> file.                       |
| 3     | Predefined inference rule.                                        |

## Predefined Inference Rules

The following inference rules are predefined in `tools.ini`:

### Predefined inference rules

Inference rule	Command
<code>.asm.exe</code>	<code>\$(AS) \$(AFLAGS) \$*.asm</code>
<code>.asm.obj</code>	<code>\$(AS) \$(AFLAGS) /c \$*.asm</code>
<code>.c.exe</code>	<code>\$(CC) \$(CFLAGS) \$*.c</code>
<code>.c.obj</code>	<code>\$(CC) \$(CFLAGS) /c \$*.c</code>
<code>.cpp.exe</code>	<code>\$(CPP) \$(CPPFLAGS) \$*.cpp</code>
<code>.cpp.obj</code>	<code>\$(CPP) \$(CPPFLAGS) /c \$*.cpp</code>
<code>.cxx.exe</code>	<code>\$(CXX) \$(CXXFLAGS) \$*.cxx</code>
<code>.cxx.obj</code>	<code>\$(CXX) \$(CXXFLAGS) /c \$*.cxx</code>
<code>.rc.res</code>	<code>\$(RC) \$(RCFLAGS) /r \$*</code>

## Customizing SMAKE Sessions with `tools.ini`

You can customize SMAKE sessions by placing default values for command line options in the initialization file `tools.ini`. Any settings you specify in `tools.ini` will be used for every SMAKE session, unless `/R` is specified on the command line. The following is a sample of SMAKE information in `tools.ini`:

```
[SMAKE]
#           macro redefinitions
           CCFLAGS = -A -wx -mn
```

```
                DEBUGFLAGS = -gh
#                inference rule
.c.boj:
                $(CC) $(CCFLAGS) $<
```

SMAKE information must follow one of the tags `[NMAKE]` or `[SMAKE]`. Case is not significant. The format for comments is the same as in makefiles. `tools.ini` is read before the makefile; you can override macro definitions and inference rules specified in `tools.ini` in the makefile.

When it searches for `tools.ini`, SMAKE searches the directory for executable files first, then the current directory, and finally in the directory specified by the `INIT` environment variable.

## Creating Response Files

SMAKE can automatically create a response file on disk, which contains whatever text you specify in the makefile. You can specify the response file by name as input to another program, link OPTLINK or LIB.

To write a line to a response file, use the command ECHO and redirect its output with one and two greater-than signs (>>). Write the first line with one greater-than sign so that ECHO creates a new file. Write the rest of the lines with two greater-than signs so that ECHO does not overwrite the file you just created.

For example, this makefile creates the program main.exe from the source files main.cpp and funcs.cpp. It not only creates a linker response file, but also writes the linker's output to cmp.err:

```
main.exe: main.obj funcs.obj
    echo main.obj+funcs.obj > linker.rsp
    echo main.exe,,, >> linker.rsp
    +link @linker.rsp > lnk.err

main.obj: main.cpp
    +sc -c main.cpp > cmp.err

funcs.obj: funcs.cpp
    +sc -c funcs.cpp >> cmp.err
```

## Changing Dates with TOUCH

Sometimes you want SMAKE to think that some files are newer than their modification date suggests. For example, you might want to recompile all your C++ source files, regardless of their dates. Or, you might want to use old object files without recompiling your source files.

The TOUCH utility changes the modification date of files to the current date. TOUCH commands have the form:

```
TOUCH file1 file2 . . .
```

Use TOUCH with SMAKE to maintain the dates of files and to modify the operation of SMAKE. For example, if you want all the C++ source files that comprise a program to be recompiled (not just the ones last modified), use the following commands:

```
TOUCH *.cpp  
SMAKE
```

Also, if you edit one or more files, but you change only comments or other items that do not affect the resultant object file, then TOUCH does not remake the object files.

```
TOUCH *.obj  
SMAKE
```



- Definition file directives for Win32 and Win32s applications, see the section "Win32 Programming Guidelines."
- Definition file directives for Win16 applications, see the section "Win16 Programming Guidelines."
- Definition file directives for DOS applications, see the section "DOS Programming Guidelines."

Win32 Programming Guidelines  
Win32 Programming Guidelines  
DOS Programming Guidelines

## **Definition File**

OPTLINK uses a module definition file (.def file) to provide additional input for its operation when generating a segmented .exe or .dll output file. The .def file usually is omitted to generate an MS-DOS .exe file. The .def file describes the essential characteristics of an application or library for Win16 or Win32. It also assigns segment sequences, function orders for encapsulated functions, and so on, even in conventional MS-DOS .exe files.

## Directive Overview

[Click a directive for more information.](#)

OPTLINK recognizes the directives summarized below. These directives and their effects are described in the paragraphs which follow.

### OPTLINK directives

<b>Directive</b>	<b>Action</b>
<u>APPLoader</u>	Used with self-loading FORTRAN applications (16-bit only)
<u>CODE</u>	Sets default attributes for code segments
<u>CODECLASSES</u>	Specifies additional class names to be treated as code segments
<u>DATA</u>	Sets default attributes for data segments
<u>DESCRIPTION</u>	Specifies one-line description of module
<u>EXETYPE</u>	Identifies target operating system
<u>EXPORTS</u>	Establishes exported functions
<u>FIXDS</u>	Eliminates the need for <code>EXPORTS</code> (Win16 only)
<u>FUNCTIONS</u>	Orders COMDAT records
<u>HEAPSIZE</u>	Establishes local-heap size in bytes
<u>IMPORTS</u>	Establishes imported functions
<u>INCLUDE</u>	Specifies the point at which another file is inserted into <code>.def</code> file
<u>LIBRARY</u>	Names dynamic link library; does not create an application
<u>LONGNAMES</u>	Indicates that module is HPFS-aware (16-bit only)
<u>NAME</u>	Assigns name to an application; does not create library
<u>NEWFILES</u>	Indicates that module is HPFS-aware (16-bit only)
<u>OBJECTS</u>	Same as <code>SEGMENTS</code>
<u>OLD</u>	Preserves export information from previous library version (16-bit only)
<u>PROTMODE</u>	Prevents module from running in real mode (16-bit only)
<u>RC</u>	During linking, copies <code>.res</code> file into <code>.exe</code> during linking
<u>REALMODE</u>	Relaxes <code>PROTMODE</code> restrictions (16-bit only)
<u>SECTIONS</u>	Same as <code>SEGMENTS</code>
<u>SEGMENTS</u>	Sets attributes for specific segments
<u>STACKSIZE</u>	Establishes local stack size in bytes
<u>STUB</u>	Adds DOS stub to generated file, usually to terminate program

## Using Definition File Directives

Only one of the directives `NAME` or `LIBRARY` can appear in a single definition file. If neither directive appears, `NAME` is the default, and the module is treated as an application.

You may enter comments in the definition file by prefixing them with a ";" The comment extends to the end of the line on which it appears.

You may use either the single- or the double-quote character, especially if the symbol matches any reserved word, regardless of case.

Except for the restriction cited above, format of the file is essentially free. Except for their actions in terminating a comment, new line characters are treated simply as white space, having no syntactic significance.

## **APPLOADER (16-bit only)**

This optional directive tells OPTLINK the name of an external symbol that is defined in a loader module and, by prefixing it with "LOADER\_" is treated as the identifying portion of the loader code segment name.

SYNTAX:     APPLOADER 'symbol'

EXAMPLE:    APPLOADER 'START'

COMMENTS: The example specifies that `LOADER_START` is the name of the code segment in the loader module at which execution is to begin. This keyword supports self-loading FORTRAN applications.

## CODE

This directive establishes the default attributes for all code segments within the application or library being linked. You must use an attribute from the following list, and only one attribute for each field may appear. Order of appearance is not significant. Fields marked with "\*" have no effect on protected-mode code segments; they apply only to real-mode modules.

### Code attributes

Field	Keywords
load	LOADONCALL (default), PRELOAD
executeonly	EXECUTEREAD (default), EXECUTEONLY
iopl	NOIOPL (default), IOPL
conforming	NONCONFORMING (default), CONFORMING
shared*	NONSHARED (default), SHARED
movable*	FIXED (default), MOVABLE
discard*	NONDISCARDABLE (default), DISCARDABLE

Meanings of the keywords for each of these fields follow. The `load` field determines when a code segment is loaded:

### Field keywords

Keyword	Meaning
PRELOAD	Automatically loads when the program begins.
LOADONCALL	Is not be loaded until it is accessed. If no attribute is specified, this is the default condition.

The `executeonly` field determines whether a code segment can be read as well as executed:

### Execution field keywords

Keyword	Meaning
EXECUTEONLY	Executes only; valid only in protected mode. Equivalent to <code>EXECUTE</code> .
EXECUTEREAD	Reads and executes. If no attribute is specified, this is the default condition. Equivalent to <code>READ</code> .

The `iopl` field determines whether a code segment has I/O privilege:

### iopl field keywords

Keyword	Meaning
IOPL	Has I/O privilege and can access hardware directly; enforced only in protected mode.
NOIOPL	Does not have I/O privilege; hardware access is made only through the operating system. If no attribute is specified for the field, this is the default condition.

The `conforming` field specifies the privilege level for the process; it is meaningful only for device drivers and system-level procedures. A conforming segment is called from either Ring

2 or Ring 3, and executes at the caller's privilege level. Keywords for this field are:

#### **Conforming field keywords**

<b>Keyword</b>	<b>Meaning</b>
CONFORMING	Is conforming. This attribute is used only in protected mode.
NONCONFORMING	Is not conforming. If no attribute is specified for the field, this is the default condition.

The `shared` field, ignored by protected mode but used by real-mode modules, determines whether a code segment can be shared by all instances of the program. Keywords for this field are:

#### **Shared field keywords**

<b>Keyword</b>	<b>Meaning</b>
SHARED	Can be shared.
NONSHARED	Cannot be shared. If no attribute is specified, this is the default condition.

The `movable` field, ignored by protected mode but used by real-mode modules, determines whether a code segment can be moved around in memory. Keywords for this field are:

#### **Movable field keywords**

<b>Keyword</b>	<b>Meaning</b>
MOVABLE	May be moved during operation.
FIXED	May not be moved during operation. If no attribute is specified, this is the default condition.

The `discard` field, ignored by protected mode but used by real-mode modules, determines whether a code segment may be discarded from memory when not currently in use. Keywords for this field are:

#### **Discard field keywords**

<b>Keyword</b>	<b>Meaning</b>
DISCARDABLE	Can be discarded.
NONDISCARDABLE	Cannot be discarded. If no attribute is specified, this is the default condition.

SYNTAX:    CODE [attribute ...]

EXAMPLE:   CODE PRELOAD EXECUTEONLY



COMMENTS: The example sets default attributes of `PRELOAD` and `EXECUTEONLY` for all code segments. These defaults may be overridden by means of the `SEGMENTS` directives. Note that some attributes imply other attributes: A `DISCARDABLE` segment is also `MOVABLE`, whether so specified or not. Similarly, a `FIXED` segment is `NONDISCARDABLE`, whether or not so specified. In case of conflicts, the last specified attribute (together with all of its implications) will be used. Thus a directive such as "`CODE FIXED DISCARDABLE`" results in attributes of "`MOVABLE DISCARDABLE`". If this is not your intention, one or the other of the attributes must be removed.

The `CODE` directive should precede any `SEGMENTS` directives in the definition file that refer to code segments; it will have no effect on any code segment declarations which precede it in the file.

## **CODECLASSES**

By default OPTLINK assumes that segments with a class name ending in `CODE` are code segments. This directive may be used to specify additional class names to be treated as "CODE".

**SYNTAX:**     CODECLASSES [classname ...]

**EXAMPLE:**    CODECLASSES TEXT

**COMMENTS:** The example specifies that class name "TEXT" identifies a code segment, in addition to the defaults.

## DATA

This directive establishes the default attributes for all data segments within the application or library being linked. Each attribute must be taken from the following list, and only one attribute for each field may appear. Order of appearance is not significant. Fields marked with "\*" have no effect on protected mode code segments; they apply only to real-mode modules.

### Data keywords

Field	Keywords
load	LOADONCALL (default), PRELOAD
readonly	READWRITE (default; equivalent to READ WRITE), READONLY
instance	MULTIPLE (default for application), SINGLE (default for DLL), NONE
iopl	NOIOPL (default), IOPL
shared	NONSHARED (default), SHARED
movable *	FIXED (default), MOVABLE
discard *	NONDISCARDABLE (default), DISCARDABLE

Meanings of the keywords for each of these fields follow. The load field determines when a data segment will be loaded:

### Data keyword explanations

Keyword	Meaning
PRELOAD	The segment is automatically loaded when the program begins. In real-mode, data should be PRELOADED.
LOADONCALL	The segment will not be loaded until it is accessed. If no attribute is specified for the field, this will be the default condition.

The `readonly` field determines access rights to a data segment. Keywords for this field are:

### readonly field keywords

Keyword	Meaning
READONLY	The segment can only be read from. This attribute is valid only in protected mode.
READWRITE	The segment can be both read from, and written into. If no attribute is specified for the field, this will be the default condition.

The `instance` field determines creation of automatic data segments, and the number that will be created. Keywords for this field are:

### Instance field keywords

Keyword	Meaning
NONE	No automatic data segment will be created.
SINGLE	A single automatic data segment will

be created. If no attribute is specified for the field, this will be the default condition for dynamic link library modules. The shared attribute is forced to `SHARED` when this keyword is used.

**MULTIPLE** Separate automatic data segments will be created for each instance of the module. If no attribute is specified for the field, this will be the default condition for application modules. The shared attribute is forced to `NONSHARED` when this keyword is used.

The `iopl` field determines whether a data segment can be accessed by code that does not have I/O privilege. Keywords for this field are:

#### **iopl field keywords**

<b>Keyword</b>	<b>Meaning</b>
<code>IOPL</code>	Access to the data segment is permitted only from code segments which have <code>IOPL</code> set.
<code>NOIOPL</code>	Access to the data segment is permitted from any code segment.

The `shared` field, ignored by protected mode if the segment has the `READONLY` attribute but used by real-mode modules, determines whether a data segment can be shared by all instances of the program. Keywords for this field are:

#### **Shared field keywords**

<b>Keyword</b>	<b>Meaning</b>
<code>SHARED</code>	One copy of the data segment will be loaded, and shared by all instances of the program. The instance attribute is forced to <code>SINGLE</code> when this keyword is used.
<code>NONSHARED</code>	The segment cannot be shared, and a separate copy will be loaded for each instance of the program. If no attribute is specified for the field, this will be the default condition. The instance attribute is forced to <code>MULTIPLE</code> when this keyword is used.

The `movable` field, ignored by protected mode but used by real-mode modules, determines whether a data segment can be moved around in memory. Keywords for this field are:

#### **Movable field keywords**

<b>Keyword</b>	<b>Meaning</b>
<code>MOVABLE</code>	The segment may be moved during operation.
<code>FIXED</code>	The segment may not be moved during operation. If no attribute is specified for the field, this will be the

default condition.

The `discard` field, ignored by protected mode but used by real-mode modules, determines whether a data segment may be discarded from memory when not currently in use.

Keywords for this field are:

### Discard field keywords

Keyword	Meaning
DISCARDABLE	The segment can be discarded as needed.
NONDISCARDABLE	The segment cannot be discarded. If no attribute is specified for the field, this will be the default condition.

SYNTAX: DATA [*attribute* ...]

EXAMPLE: DATA PRELOAD

COMMENTS: The example sets the default attribute for all data segments to `PRELOAD`. As with the `CODE` directive attributes, it is possible to declare contradictions and in such cases the last declared attribute takes effect, canceling earlier ones. The fields which interact with each other are the instance and shared fields.

The `DATA` directive should precede any `SEGMENTS` directives in the definition file that refer to data segments; it will have no effect on any data segment declarations which precede it in the file.

## **DESCRIPTION**

This directive inserts its associated text into the application or library being linked.

**SYNTAX:**     DESCRIPTION '*text*'

**EXAMPLE:**   DESCRIPTION 'Copyright 1993 by Symantec Corp.'

**COMMENTS:** The example causes the copyright notice to be embedded into the application or library being linked. Maximum length of the text is 254 characters. This directive differs from a comment line in that comments are not added to the output module.

## EXETYPE

This optional directive tells OPTLINK the operating system under which the executable file is to run. The `EXETYPE` keyword must be followed by one of five operating system keywords.

**SYNTAX:** `EXETYPE [OS2 | WINDOWS [n.nn] | DOS4 | UNKNOWN | DOS | NT]`

**EXAMPLE:** `EXETYPE WINDOWS 3.00`

**COMMENTS:** The example specifies that the current executable file is to run under Windows version 3.00. If no `EXETYPE` directive appears in the definition file or if Windows appears without a specified minimum version, Windows version 3.10 is assumed.

This directive sets bits in the `.exe` header which are checked by the operating system loader to verify that the program being loaded was intended to be run under that system.

The `DOS` keyword selects "normal" MS-DOS EXE file format, and is required if you use a definition file to create such an executable. One reason for doing so would be to take advantage of the COMDAT-record capabilities to assign functions to specific segments via the `FUNCTIONS` directive. Another is to specify segment order with `SEGMENTS`. The only definition-file directives that make sense for use with "`EXETYPE DOS`" are `INCLUDE`, `SEGMENTS`, `FUNCTIONS`, `STACKSIZE`, and `EXETYPE` itself.

The `DOS4` and `UNKNOWN` keywords are recognized but are not supported.

## EXPORTS

By default, functions within one executable file (including Dynamic Link Libraries, DLL's, which are bound at run time) are hidden at run time from all other executable files. This directive makes specified functions available to other executable files at run time. It is also used to define names and attributes for functions that run with I/O privilege. Note that the `FIXDS` directive may be used to reduce the need for `EXPORTS`.

Each export definition begins with the *extname*, which is the name of the function being defined, as it is known outside its own executable file. This may be followed by the "=" symbol and the *intname*, the name as it appears inside the executable file. If no *intname* is given, it is assumed to be the same as the *extname*.

If the function may be referenced by name or by ordinal position within the executable file's entry table, the "@" symbol followed by *numb*, the ordinal position number, should appear next. If the name is to remain resident at all times even though *numb* is given, the keyword `RESIDENTNAME` should follow. If the symbol can only be referenced by ordinal number, the keyword `NONAME` should follow. Use of ordinals and `NONAME` provide the smallest executable files and fastest access.

The remaining two fields apply to functions with I/O privilege. For protected mode, *parms* specifies the total number of words occupied by the function's parameters. For real-mode Windows, the keyword `NODATA` may appear.

**SYNTAX:**     `EXPORTS`  
                  *extname*[=*intname*] [@*numb*[ `RESIDENTNAME` | `NONAME`]][ *parms*][ `NODATA`]  
                  ...

**EXAMPLE:**    `EXPORTS`  
                  `CharInput 6`  
                  `GetString = StringIn`  
                  To export a symbol starting with an "@", enclose the  
                  symbol in quotes.

**COMMENTS:** The example defines two functions within the current executable file as being available to other executable files: `CharInput`, defined elsewhere as having I/O privilege, uses 6 words of parameter information; `GetString` is defined within the executable file as `StringIn`. See also the discussion of the `FIXDS` directive for an alternative method of exporting functions under Windows, but not for OS/2.



## **FIXDS (Win16 only)**

This directive, which is useful only for Windows applications, eliminates the need for the `EXPORTS` directive. It cannot be used with dynamic link libraries, or for OS/2 executable files.

**SYNTAX:**     `FIXDS`

**EXAMPLE:**    `FIXDS`

**COMMENTS:** When this directive is used, the entire `EXPORTS` section becomes superfluous. So does every call to `MakeProcInstance()` or `FreeProcInstance()` in the executable file. Where the return value from `MakeProcInstance()` was used (such as a `DialogBox()` call), just use the function name instead.

`FIXDS` also gives one capability that isn't ordinarily available: your Windows application can export functions to be called from a dynamic link library. You can do this by listing, in the `EXPORTS` section, the functions to be made available to the `.dll`. (This is the only case requiring an `EXPORTS` section, and only the functions to be made available to `.dll`'s should be listed.) Then run `OPTIMP` on this `.def` file to produce a `.lib` that can be linked with the `.dll`'s.

## **FUNCTIONS**

This directive is used to order COMDAT records and optionally assign them to specific segments.

**SYNTAX:**     FUNCTIONS [ :segmentname ]  
                  functionnames

**EXAMPLE:**    FUNCTIONS  
                  Function1  
                  Function5  
                  Function2

**COMMENTS:** The example resequences three functions to appear in the order in which they are named. All functions named in this directive must be contained in COMDAT records, which may not be available from all language processors.

## HEAPSIZE

This directive sets the size of the executable file's local heap, in bytes, and thus affects the size of the automatic data segment, if any.

**SYNTAX:** `HEAPSIZE n[, commit] or HEAPSIZE MAXVAL`

**EXAMPLE:** `HEAPSIZE 2000`

**COMMENTS:** The example establishes size of the local heap at 2000 bytes. *n* is the total heap space to reserve; it must be an integer. *commit* is the amount of memory to allocate each time the program runs.

For compatibility with Microsoft LINK, the default *commit* size is 4KB. The minimum value for `HEAPSIZE` is 64KB.

By default, *n* and *commit* are to assumed be decimal, but the C language conventions for hexadecimal and octal values can be used if desired.

For 16-bit output only, if the keyword `MAXVAL` is used instead of a number, the size of the heap will be set at 65,520 bytes (64KB minus 16) minus `STACKSIZE`, minus the area within `DGROUP` that is statically allocated by the program. This provides the largest possible heap with no need for calculations. Windows requires that `DGROUP`'s size be smaller than 65,520 bytes.

## IMPORTS

This directive specifies all functions referenced in the current executable file (including Dynamic Link Libraries, DLL's, which are bound at run time) that actually appear in other executable files, by name and executable file. The `IMPORTS` directive appears on a line by itself, followed by any number of import definitions. For 16-bit output, the only limit on the number of definitions is that total storage required for the names cannot exceed 64KB.

Each import definition consists of an optional internal name, and a required executable file name and function identifier pair. The function identifier, *func* in the syntax description which follows, may be either the name listed in the `EXPORTS` definition of the exporting executable file, or an ordinal value. If it is an ordinal value, then the internal name is required. If the internal name is omitted and *func* is a name, it is used as the internal name.

SYNTAX:     `IMPORTS`  
              `[internal=]externalfile.func`  
              `...`

EXAMPLE:    `IMPORTS`  
              `read.CharInput`  
              `NewString = read.GetString`

COMMENTS: The example defines two functions to be imported from an executable file or library named "read" into the current executable file. The first of these was listed by the `EXPORTS` directive of "read" as `CharInput`, and the other as `GetString`. Within this executable file, `CharInput` is known by that name, but `GetString` is referred to as `NewString`. See also the example for the `EXPORTS` directive.

A much simpler way to accomplish the same goal is to use the `IMPLIB` utility to create import libraries for each `.dll` and `.exe` that you will be importing functions from, and then link those import libraries into the using file.

**See Also**

EXPORTS

## **INCLUDE**

This optional directive tells OPTLINK the name of a file to be included in the `.def` file at this point.

**SYNTAX:**     `INCLUDE filename`

**EXAMPLE:**    `INCLUDE generic.inc`

**COMMENTS:** The example specifies that file `generic.inc` is to replace the `INCLUDE` line. Processing continues with the first line of `generic.inc`. Include files may be nested up to 10 levels deep. At the end of each file, processing continues with the next line of the file at the next higher level.

## LIBRARY

This directive indicates that the executable file produced is a dynamic link library, and optionally assigns it a name and specifies the initialization required. If no name is given, the name of the executable file (less extension) is assumed. Initialization is specified by one of the listed keywords; if none is given, `INITGLOBAL` is assumed. "

### Library keywords

Keyword	Meaning
<code>BASE</code>	Equivalent to the <code>/BASE</code> switch; see "OPTLINK Switches" for information.
<code>INITGLOBAL</code>	The library's initialization routine is called only when the module is initially loaded into memory.
<code>INITINSTANCE</code>	The library's initialization routine is called each time a new process gains access to the library.
<code>PRIVATELIB</code>	The library is a private DLL; that is, it can be referenced by only one application at a time.
<code>PROCESSINIT</code>	Calls the library's entry point when a process attaches.
<code>PROCESSTERM</code>	Calls the library's entry point when a process terminates.
<code>THREADINIT</code>	Calls the library's entry point when a thread is created.
<code>THREADTERM</code>	Calls the library's entry point when a thread terminates.
<code>WINDOWAPI</code>	This is a Windows (or PM) application and can execute only in the Windows or PM environment. For Windows, this eliminates the need to use RC if there are no resources.

SYNTAX: `LIBRARY [libname] [init] [privatelib]`

EXAMPLE: `LIBRARY mylib INITGLOBAL`

COMMENTS: The example defines a dynamic link library named `mylib` and specified that it is to be initialized only when first loaded into memory.

## **LONGNAMES (16-bit only)**

This directive may be used to specify a program that is HPFS-aware. It sets a bit in the file header which makes it possible for the program to access the high performance file system.

SYNTAX:     LONGNAMES



## NAME

This directive indicates that the executable file produced is an application, and optionally assigns it a name and defines its type. If no name is specified, the name of the executable file (less its extension) becomes the name of the application. Three keywords are defined to signify type information, as follows:

### Name keywords

Keyword	Meaning
BASE	Equivalent to the /BASE switch; see "OPTLINK Switches" for information.
WINDOWAPI	This is a Windows (or PM) application and can execute only in the Windows or PM environment. For Windows, this eliminates the need to use RC if there are no resources. This is the default if no keyword is supplied.
WINDOWCOMPAT	This application can run inside PM, or it can run in a separate screen group. Any application which uses the proper subset of OS/2 mouse, keyboard, and video functions that are supported in PM applications can be of this type.
NOTWINDOWCOMP AT	This application must operate in a separate screen group from PM as it is not PM-compatible.

SYNTAX:     NAME [apptype] [apptype]

EXAMPLE:    NAME myapp

COMMENTS: The example defines an application named `myapp` and specifies (via the `WINDOWAPI` default) that it can be run only under Windows or PM. The `apptype` information is kept in the executable-file header.

## **NEWFILES (16-bit only)**

This directive may be used to specify a program that is HPFS-aware. It sets a bit in the file header which makes it possible for the program to access the high performance file system, in which file names need not follow the "normal" MS-DOS filename.ext (8.3) convention.

SYNTAX:     NEWFILES

## **OBJECTS**

This directive is identical to the `SEGMENTS` directive. Refer to the `SEGMENTS` directive discussion for details.

## **OLD (16-bit only)**

This directive tells OPTLINK to search another executable file (normally a DLL) for `EXPORT` ordinals. OPTLINK searches the directories listed in the path environment variable to locate the executable file, if it is not in the current working directory. If the file is not found, a warning is issued. Exported names in the current executable file which match those in the old executable file are assigned ordinal values from the old executable file.

SYNTAX: `OLD 'filename'`

EXAMPLE: `OLD 'oldlib.exe'`

COMMENTS: The primary use of this directive is to preserve the original ordinal numbers, through successive revisions of a library executable file. Refer to the `EXPORTS` and `IMPORTS` directives for more information about ordinal numbers for function identification.

## **PROTMODE (16-bit only)**

This directive specifies that the executable file be run only in protected mode, and not in real or dual mode. If neither this directive nor the `REALMODE` directive is present when `EXETYPE` is `WINDOWS`, `OPTLINK` assumes that the application can run only in protected mode.

**SYNTAX:**     `PROTMODE`

**COMMENTS:** `PROTMODE` should always be used when generating protected-mode-only `.exe` files; less relocation information is required, thus yielding faster linking, a smaller output `.exe` file, and faster loading at run time. `OPTLINK` cannot assume `PROTMODE` when you specify "`EXETYPE OS2`", since you may "`BIND`" this as a family (real-mode) application, thus requiring the extra relocation information.

## RC

This optional directive tells OPTLINK to copy binary resources from a `.res` file into the binary output file generated, and to set the appropriate flags in the header to indicate that the file is valid for Windows. By default, it also reorders segments and resources in such a manner that any preloaded, or fixed, or non-discardable segments and resources appear first, in a "fast-load" section, followed by the items that are to be "demand-loaded".

SYNTAX: `RC [ -e -k -l -m -p -t -30 -31 ] filename.res`

EXAMPLE: `RC myfile.res`

COMMENTS: The example specifies that the binary resources in `myfile.res` are to be copied to the output `.exe` or `.dll` file, eliminating the need to run the resource compiler after linking. Segments and resources are reordered as necessary to assure that preloaded items appear first.

The eight option switches accepted by this directive have the following meanings:

- `-e` Create a driver which uses EMS memory.
- `-k` Keep segments in `.def` file order; do not sort or create a fast-load section.
- `-l` LIM 3.2 EMS application is to be created.
- `-m` Set Multiple Instance flag.
- `-p` Create a private library (`PRIVATELIB`).
- `-t` Create a protected-mode-only application (`PROTMODE`).
- `-30` Tag the executable as requiring Windows 3.0 or later to run.
- `-31` Tag the executable as requiring Windows 3.1 or later to run.

If no filename is supplied, `xxx.res` (where `xxx` is the output filename) is assumed. The current default directory is searched first for the file. If none is found there, the path(s) listed in the `OBJ` environment variable are used. If none is found there, the path(s) listed in the `LIB` environment variable are used. If the file is not found, a valid no-resource output file is created.

## **REALMODE (16-bit only)**

This directive specifies that the executable file can be run in real or protected mode. If neither this directive nor the `PROTMODE` directive is present, `OPTLINK` assumes that the application can run only in protected mode for "EXETYPE WINDOWS". The default is `REALMODE` for "EXETYPE OS2".

**SYNTAX:**     `REALMODE`

## **SECTIONS**

This directive is identical to the `SEGMENTS` directive. Refer to the `SEGMENTS` directive discussion for details.



## SEGMENTS

This directive establishes the attributes of one or more segments on an individual segment by segment basis, and overrides the defaults specified by the `CODE` and `DATA` directives. The `SEGMENTS` directive appears on a line by itself, followed by one or more definition lines. These definition lines, by their sequence, establish the order in which segments appear in the output file.

Each definition line begins with a segment name, which may be enclosed in single quotes (the quotes are required, if the name conflicts with any `OPTLINK` keyword). The keyword `CLASS` may then appear, followed by a class name in required quotes. If no `CLASS` is specified, `CODE` is assumed. The rest of the line contains attributes for the fields applicable to the segment's class, from the lists presented in describing the `CODE` and `DATA` directives.

SYNTAX: `SEGMENTS`

```
[']segname['][ CLASS'classname'] [ attribute [attribute ...]]  
[']segname['][ CLASS'classname'] [ attribute [attribute ...]]  
...
```

EXAMPLE: `SEGMENTS`

```
seg1 EXECUTEREAD CONFORMING  
seg2 CLASS'special' IOPL  
seg3 CLASS'data' READONLY
```

COMMENTS: The example defines three segments, named `seg1`, `seg2`, and `seg3`. The class of `seg1` is `CODE` by default, that of `seg2` is "special", and that of `seg3` is `data`.

Note that the `SEGMENTS` directive can implicitly change the type of a segment: calling a code segment with an attribute of `READWRITE` causes that segment to be treated as a data segment. The opposite is also true: calling a data segment with an attribute of `EXECUTEREAD` causes that segment to be treated as code.

It is also essential to preserve case significance in all references to segment or class names; wrong case or other typographical errors in segment or class names are not flagged as errors. `OPTLINK` ignores erroneous segments and no relevant information is generated within the `.map` file.

Private segments should be avoided since the `SEGMENTS` directive affects only the first occurrence of a private segment with a given name and class.

## **STACKSIZE**

This directive performs the same functions as the command-line option switch `/STACKSIZE`, but overrides the effects of the option switch.

**SYNTAX:** `STACKSIZE n[, commit]`

**EXAMPLE:** `STACKSIZE 1024`

**COMMENTS:** The example sets stack size for the generated module to 1024 bytes, no matter what is specified on the command line when OPTLINK is run. *n* is the total stack space to reserve; it must be an integer, and should be an even number since stack operations are normally performed in units of 2-byte words. *commit* is the amount of memory to allocate each time the program runs. By default, *n* and *commit* are assumed to be decimal, but the C language conventions for hexadecimal and octal values can be used if desired.

## STUB

By default, OPTLINK adds a standard "stub" routine to the output executable file to terminate its operation with a warning message if a user attempts to execute the file under MS-DOS. This directive permits a substitute stub file to be defined for inclusion in the output. This can often be used to "stub" in a DOS version of the program, permitting the same .exe file to run under DOS and Windows. OPTLINK searches the directories listed in the PATH environment variable to locate the stub file, if it is not in the current working directory.

SYNTAX: STUB 'filename' or STUB:NONE

EXAMPLE: STUB 'newstub.exe'

COMMENTS: The example causes file `newstub.exe` to be inserted into the output executable file for execution under MS-DOS. If `newstub.exe` is not found in the current directory while linking, the list of directories specified in the `PATH` environment variable will be searched. If the file cannot be found, a warning is issued. If the file is found, but is not a valid MS-DOS .exe file, an error occurs.

If the keyword `NONE` is used, no stub at all will be included in the output file. This generates a slightly smaller .exe file, but one which will crash with no warning if an attempt is made to run it under MS-DOS.

## **VERSION**

Equivalent to the `/VERSION` switch; see "OPTLINK Switches" for information.

## **Linker Operation**

The purpose of a linker is to convert object files into an executable form by resolving address references that span object module boundaries. This makes it possible to combine a number of distinct object modules into a single executable program. In the absence of such a capability, it would not be possible to create today's complex systems.

The file format accepted by the linker is rigidly defined; each file contains all information required to resolve all address references contained within it, although this may be simply a reference to some "external" symbol. As the linker processes successive object modules, such external references may be resolved. If any remain unresolved after the last module has been processed, the link operation has failed.

## **Modularly Designed Programs**

Most programs are modularly organized into relatively small sections that perform a single function or procedure. Each of these smaller sections may, in turn, call upon others, so that the final program becomes hierarchical.

Organizing programs in this manner maximizes the opportunity to re-use code. For example, once you (or someone else) have created a function to input a single keystroke from the keyboard, you never need to re-create it. All you have to do is to refer to the function whenever you need to get keyboard input.

For this strategy to work, it's necessary that organization and formats follow certain rules. These rules were set forth, for "object modules", by Intel in their specification for Object Module Format (OMF), and have been extended by other firms (notably Microsoft and Borland).

In addition to making it easy to re-use common functions and procedures, modular design has another significant advantage: when you change a program, only those functions that were actually changed need to be re-compiled. The entire collection of object modules that make up your program are re-linked.

## Source File Design

To organize a program into a series of object modules, the place to start is with the program's source file(s). Most high-level language compilers create a single object file from a single source file, no matter how many different functions or procedures that file contains.

Originally, if you placed all your functions and procedures into the same source file, the compiler would put them all into a single object module. Then, when you need only one of those object modules later, you'll find that all the other object modules are loaded along with the one you wanted. To overcome this, it was necessary to break the source file into a number of smaller source files, each containing only one (or a few, related) functions.

Organizing source files in this manner tended to complicate maintenance of the program, but simplified re-use of the code.

The preceding paragraph was true until the introduction of "smart linking". It is now possible to generate encapsulated functions within a single object module, yet have only those functions which actually are used by a specific program linked into the executable file.

OPTLINK recognizes the special records that make this possible and treats them correctly.

However, not all language processors yet generate the special COMDAT records that make smart linking work.

A compromise that addresses both problems is to combine the smaller source files into a single larger file for storage and while editing, but then split it into smaller files before compiling or assembling it. Details of doing this are outside the scope of this manual; the thing to keep in mind is the trade-off between ease of maintenance and ease of re-use, so that you can plan your projects for maximum effectiveness in both areas.

When you run source files through a compiler or assembler, the normal output is one or more object modules per file. These individual modules must still be linked; that is, they must all be combined into a single executable program, with memory locations assigned to each symbol in each module, and all references within each module to symbols which are defined in other modules must be resolved. This task is a function of OPTLINK.

## **Object Module Library Design**

When a complex program is properly divided into its component sections, the number of object modules involved can easily become huge. Just keeping track of all these modules can become a serious problem.

To solve this problem, the concept of an "object module library" or "library" was invented. A library is a collection of object modules combined into a single file, together with an index that makes it possible to quickly locate any module contained in the library.

Most high-level languages include one or more "run time library" files as a part of their package, and make extensive use of the modules it contains. In addition, general software products such as screen display utilities may be sold as add-on libraries. And you can combine your own object modules into libraries as well. Thus using libraries is the way to simplify tracking the numerous modules involved in a complex program.



## Library Searching

While collecting object modules into library files makes it simpler to keep track of the many modules involved in a typical program, the use of library files imposes some constraints on the linker program's operation. Only those modules that are required by the program being linked need actually be included in the final executable file. A library contains some form of indexing so that the linker can locate requested modules readily, without having to search through every object module stored in the library.

Typically, an object module's original source contains references to symbols which may be in other object module's source compiled at approximately the same time, and also contain references to symbols defined in modules within the libraries being used. These are known as "external" symbol references, and each time an actual memory location is assigned to one of these symbols, it is said to "resolve" the symbol reference.

If any external symbol references remain unresolved after all object modules have been processed, the linker searches for their definitions within any libraries that have been specified. Each object module specified to the linker for inclusion (whether specified explicitly, or by being located during a library search) may resolve previous external symbol references, but it may also introduce new ones that will require resolution.

OPTLINK will search any number of libraries in order to resolve external references that remain after all supplied object modules have been processed. The library files to be searched may be specified either by means of commands embedded in the object modules, or by explicit commands to OPTLINK. If any references remain unresolved after all libraries have been searched, OPTLINK reports an error, but can still create the executable file (see `/ONERR` and `/ERRORFLAG` options).

A significant difference between OPTLINK and other linkers is that OPTLINK always resolves external references from the first library (in the supplied or default list of library files) that contains a definition, even if the reference itself occurs in a subsequent library. Microsoft LINK and many other linkers resolve such a reference by using the first definition found after the reference

## Reading Object Modules

The first action taken by OPTLINK (after setting all applicable switches for the current run) is to read all .obj files, in the sequence in which they are specified in the FILE command. You control the sequence in which files are read by the sequence in which you provide them to OPTLINK. In some cases, this is significant. As OPTLINK reads the files, it collects information about sizes, segments, and symbols, for use in the later stages of linking.

OPTLINK searches for each file first in the current working (default) directory, then in the directories named by the `OBJ` environment variable, and finally in the directories named by the `LIB` environment variable.

If a requested object module cannot be found, operation terminates with a fatal error.

## Search Library Link

After all object modules named in the input have been read, OPTLINK then searches through all applicable library (.lib) modules while any EXTERN symbols remain undefined.

The modules first searched are those named in the command line or supplied interactively, followed by those named in the input data (searched in the order in which they were named). The first PUBLIC symbol encountered that matches an undefined EXTERN is used and any subsequent occurrences of that symbol as a PUBLIC are ignored, so the sequence in which libraries are searched may have significant impact on a program's operation.

After all named libraries have been searched, or if no libraries are named in the input, the libraries called for by internal records of the object modules (i.e. requested by the translator which generated the object modules) are searched unless this capability has been turned off by the use of the /NODEFAULTLIBRARYSEARCH command.

In library searches, when no path is specified with the library name, the current default directory is searched first when looking for any specific .lib file. If none is found there, the path(s) listed in the LIB environment variable are used. If a requested library module cannot be found, a warning message is issued but operation continues.

## Assigning Segment Addresses

Physically, every segment must begin on a paragraph boundary (an address of which the low four bits are all zero). Every segment referenced in a program is identified by two things: a segment name and a class name.

The segment name is assigned by you, if you write in assembly language, when you use the `SEGMENT/ENDS` declarations. If the object module was generated by a high level language, the segment name is assigned by the translator. The class name is also supplied by you, by means of a modifier you may add to the `SEGMENT` declaration. If given, the class name is enclosed in single quotes, as in:

```
CODESEG          SEGMENT          PUBLIC BYTE 'CODE'
```

In this example, the segment name is `CODESEG` and the class name is `CODE`.

Unless a `/PACKCODE` or `/PACKDATA` option switches are used, `OPTLINK` combines segments having matching segment and class names based on their `combine type`, which may be `PUBLIC`, `COMMON`, `PRIVATE`, or `STACK`. `PUBLIC` segments combine into a single bigger segment; `COMMON` segments are assigned the same address (that is, all use the same memory, at the same time), and `PRIVATE` segments are not combined at all. The final attribute of a segment is its alignment, which may be `BYTE`, `WORD`, `DWORD`, `PARA`, or `PAGE` (corresponding to boundaries at multiples of 1, 2, 4, 16, or 256, respectively).

Within each program, all segments of the same class are loaded in memory adjacent to each other. If no alignment is specified, `PARA` is used.

## **Segment Re-Ordering**

Segments may be, and often are, collected into `groups` by language translators. The difference between segments in a group and those which are not is that, in a group the applicable segment register is not changed when moving from one segment to another within the group. If groups are not used, code to change the segment register is required whenever the segment changes. Like segments themselves, the size of any group may not exceed 65,536 bytes.

## **Collecting Relocation Information**

When all the segments, groups, combine types, and classes have been sorted out and processed appropriately, addresses are assigned to all the segments. With all addresses known, relocation tables can be generated (internal to OPTLINK) which are then used to reconcile address references.

## **Assigning Public Addresses**

All `public` symbols within any object module are identified as such, and only such `public` symbols can be addressed from outside the module. OPTLINK keeps track of the segment and offset values for each `public` symbol encountered, both while reading the object modules and when a library search locates a module that contains a needed `extrn` symbol declared to be `public`.

## **Reconciling Address References**

Every standard `.obj` module normally contains several records devoted to relocation information. These records, identified in the OMF documentation as type `FIXUPP`, are universally called "fix-ups."

Fix-ups are processed after all segment addresses and symbol references are known, to perform final reconciliation of cross-module references.



## **Writing Output Files**

When all address references have been reconciled, OPTLINK writes the output executable file and any requested report files.

## **OPTLINK Overview**

OPTLINK, the Symantec linker, links object files and libraries to produce an executable program or DLL for DOS, Windows 3, or Win32. Most of the time you probably won't need to run OPTLINK on its own, because the compiler automatically calls OPTLINK unless you specify otherwise.

However, if you need more control over how your files are linked than you can get by setting options in the Linker subpage on the Build page of the IDDE's Project Settings dialog box, run OPTLINK separately and link the files yourself.

### **What is OPTLINK?**

OPTLINK is a super-fast, high-capacity program linker. It is designed for use by professional programmers to efficiently create both standard `.exe` and `.com` executable files for use with MS-DOS and segmented `.exe` files (segmented executable) and dynamic link libraries (`.dll`) for use with Windows and Win32 in significantly less time than is required by other linkers.

### **What does OPTLINK do?**

OPTLINK combines program and library files into a single file that is executable by the operating system. OPTLINK may also, at your option, create memory maps and symbol tables that you can use to assist in debugging your application.

OPTLINK works with modules in Intel OMF format (`.obj` file), including those generated by standard assemblers and compilers and standard `.obj` module libraries. The output files produced have all address assignments resolved and are in one of three standard formats: the `.exe` relocatable executable format, the `.com/.sys/.bin` memory image format (both apply only to MS-DOS output files), the 16-bit segmented `.exe` format used by Windows, or the 32-bit `.exe` format used by DOSX or Win32.

### **How OPTLINK works**

All available memory is used by OPTLINK when creating your executable program. In 16-bit programs, the number of program description objects that can be accommodated is limited to 64KB for each kind of object (PUBLIC, LIBRARY, SEGMENT, and so on). If memory space is inadequate, the program descriptions are automatically paged out to disk files which are then deleted once the link process completes.

These features combine to create an environment in which you can create large programs, despite apparent memory constraints.

## OPTLINK Features

Although compatibility with existing linkers was a prime objective in the design of OPTLINK, the product sets itself apart from other linkers with a number of exclusive features. OPTLINK features include:

- **Speed**  
Executes faster than any other method for creating executable files. Removal of duplicate records (CVPACK) is built in.
- **Capacity**  
Successfully builds huge applications, including debug information.
- **Smart linking**  
Unlike others, recursively eliminates unreferenced code. Also eliminates unreferenced uninitialized global variables, see `/PACKFUNCTIONS`.
- **Efficient program generation options**  
Builds smaller, more efficient, faster loading and even faster running 16-bit programs by packing code and data, plus converting intra-segment far calls to near calls, see `/PACKCODE`, `/PACKDATA`, `/EXEPACK`, `/FARCALLTRANSLATION`.
- **Cross referencing**  
Optionally included within `map` output. Every global symbol and the module name(s) of where defined and referenced is listed, see `/XREF`.
- **Environment use**  
Dedicated environment variable usage simplifies searches.
- **Virtual memory system**  
When DOS hosted, automatically uses EMS memory, XMS memory, or disk storage, whichever is available.

## Setup of the OPTLINK Linker

Reading the following will help you better understand OPTLINK.

### Option switch precedence

Reading the following will help you better understand OPTLINK. Any subsequent switch overrides any previous switch setting.

- The `optlinks.cfg` configuration file.
- The `LINK` environment variable.
- The `OPTLINKS` environment variable.
- Command line and indirect response file in the order supplied. Recognizes the most recent switch syntax selected.

### OPTLINK configuration

To specify default operating parameters not available through the IDDE, modify the file named `optlinks.cfg`. You can supply option switches that you may regularly use or desire as default. When called, `optlinks.cfg`, an ASCII file, is read by OPTLINK from its home directory, unless `optlinks.cfg` already exists in the current directory. OPTLINK recognizes the "#" as a comment character and thus ignores the remainder of the line.

### DOS environment variables

The environment variable names recognized are `LIB`, `TMP`, `LINK`, `OPTLINKS` and `OBJ`. OPTLINK also searches the `PATH` environment variable to locate certain executable files. The environment variables are typically defined in `autoexec.bat` or another batch file.

### LIB

Supplies paths to search for libraries, object files, and resource files. See also `/SCANLIB`.

### TMP

Supplies a path used by OPTLINK for its virtual memory file. Otherwise, the current directory is used. OPTLINK's performance can be severely slowed when its virtual memory file must be stored across a network.

### LINK

Supplies linker switch settings. Recognized for Microsoft LINK compatibility. See also `/SCANLINK`.

### OPTLINKS

Supplies linker switch settings. OPTLINKS is scanned after the LINK variable and can override any previous settings specified.

### OBJ

Supplies paths to be searched by OPTLINK for `.obj` files not found in the current working directory. Paths specified by `OBJ` are always searched before any paths specified by the `LIB` environment variable.

### PATH

Supplies paths to be searched by OPTLINK for any stub `.exe` file specified in the `.def` file. For example, to select the linker option `/IGNORECASE` as the default, the following command could be used:

```
SET OPTLINKS=/IG
```

The environment variables can be overridden by command line input. Every switch can be changed, since it has an opposite.

## **DLL Version of OPTLINK**

The DLL version of OPTLINK is `linknd.dll`.

## Optimizing Linker Performance

For fast execution of the linker, follow these guidelines.

- Disable relocation checks by using the /NORELOCATIONCHECK option.
- If the /MAP option is being used to create a .map file, disable sorting of the map by using the /MAP:address option.
- If the /MAP option is being used to create a .map file, disable placement of line number information in the map by using the /NOLINENUMBERS option (the default).
- If the executable file is a Windows program, use the /RC option to add resources to the executable file.
- If you are running OPTLINK from a Windows DOS box, use the DPML version (`link.exe`) and set the DOS box .pif file parameters in `dosprmpmt.pif` as follows:  
XMS required: 0                      XMS memory not locked (-1 desired)  
EMS required: 0                      EMS memory not locked (-1 desired)
- Configure a small RAM disk so more EMS, XMS, or DPML memory is available for OPTLINK.
- Avoid linking to a network server.

## **Number Representation**

Several option switches require you to supply numeric values. These are indicated by the suffix `:n` or `=n` within the syntax description. You must separate the numeric value from the option by the appropriate colon or equals sign.

The numeric base is, by default, decimal. If the value begins with an `0`, its base is taken to be octal, and if it begins with `0x` or `0X`, hexadecimal is assumed. That is, the standard C language base convention is assumed by OPTLINK.

## OPTLINK Option Switch Overview

Click an option switch name for more information.

The following is an overview of OPTLINK switches. Either a "-" (hyphen) or a "/" (slash) must precede an option switch. You can find further descriptions of the option switches and their possible opposites in "Using OPTLINK Option Switches" below.

### OPTLINK option switches

<b>Option Switch</b>	<b>Purpose</b>
<u>ALIGNMENT</u>	Segment alignment size
<u>BASE</u>	Set the base address of the executable image
<u>BINARY</u>	Generates a .sys file
<u>BYORDINAL</u>	Export by ordinal
<u>CHECKSUM</u>	Parsed and ignored
<u>CODEVIEW</u>	Outputs CodeView debugger information
<u>COMDEFSEARCH</u>	Specifies whether an undefined COMDEF causes a library search
<u>CPARMAXALLOC</u>	Sets .exe maximum bytes to occupy in DOS RAM
<u>CVVERSION</u>	Preserves OPTLINK's CodeView compatibility.
<u>DEBUG</u>	Controls all debug information for files that follow
<u>DEBUGFILES</u>	Controls debug information for specific files only
<u>DEBUGLINES</u>	Controls debug line number information for files that follow
<u>DEBUGLOCALS</u>	Controls debug local symbols information for files that follow
<u>DEBUGMODULES</u>	Controls debug information for specific modules only
<u>DEBUGPUBLICS</u>	Controls debug public symbols information for files that follow
<u>DEBUGTYPES</u>	Controls debug type information for files that follow
<u>DEFAULTLIBRARYSEARCH</u>	Searches default libraries named in .obj files
<u>DELEXECUTABLE</u>	Deletes .exe upon encountering any linking errors
<u>DETAILEDMAP</u>	Produces detailed map reports.
<u>DOSSEG</u>	Controls segment sequence
<u>ECHOINDIRECT</u>	Controls echoing of indirect response file input
<u>EMSMAXSIZE</u>	Sets maximum EMS size
<u>EMSPAGEFRAMEIO</u>	Gives permission to use EMS page frame for I/O
<u>EMSUSE40</u>	Allow LIM 4.0 adherence



<u>ERRORFLAG</u>	Controls error flag in segmented executable header
<u>EXEPACK</u>	Performs run-length encoding (packs executable)
<u>EXETYPE</u>	Specifies the target operating system
<u>FARCALLTRANSLATION</u>	Converts intra-segment far calls to near
<u>FIXDS</u>	Identical to the <code>.def</code> directive <code>FIXDS</code>
<u>FIXED</u>	Fixes the executable image in memory
<u>GROUPASSOCIATION</u>	Controls <code>GROUP</code> information found in <code>.obj</code>
<u>GROUPSTACK</u>	Controls stack definition in <code>.exe</code> file header
<u>HEAP</u>	Sets the size of the local heap
<u>HELP</u>	Displays switch options
<u>IGNORECASE</u>	Preserves and ignores case of all symbols
<u>IMPDEF</u>	Generate <code>.din</code> file from <code>EXPORTS</code> section of <code>.def</code> file
<u>IMPLIB</u>	Create <code>.lib</code> import library for <code>.dll</code>
<u>INFORMATION</u>	Display status information throughout the link process.
<u>LINENUMBERS</u>	Outputs line number information in <code>.map</code> file
<u>LOWERCASE</u>	Converts all symbols to lowercase
<u>MACHINE</u>	Specifies the type of the target machine
<u>MAP</u>	Controls information content in <code>.map</code> file
<u>NOLOGO</u>	Suppresses OPTLINK's sign-on copyright message
<u>NONAMES</u>	Eliminates name text for ordinal exports
<u>NULLDOSSEG</u>	Outputs null bytes in the <code>_TEXT</code> segment
<u>ONERROR</u>	Same as <code>/DELEXECUTABLE</code>
<u>PACKCODE</u>	Combines segments of class <code>CODE</code>
<u>PACKDATA</u>	Combines data segments where possible
<u>PACKFUNCTIONS</u>	Performs "smart-linking" on code and data
<u>PACKIFNOSEGMENTS</u>	Forces <code>/PACKCODE</code> on when no

	SEGMENTS directive
<u>PACKSIZE</u>	Packs size for /PACKCODE and /PACKDATA
<u>PAGESIZE</u>	Set /IMPLIB page size
<u>PAUSE</u>	Provides time to swap disks while creating output
<u>PMTYPE</u>	Specifies type of segmented output
<u>PROMPT</u>	Specifies whether OPTLINK will prompt for more options
<u>RC</u>	Like .def directive RC, automatic resource binding
<u>RELOCATIONCHECK</u>	Ensures no relocation overlaps have occurred
<u>REORDERSEGMENTS</u>	Performs segment reordering
<u>SCANLIB</u>	Scans the LIB environment variable
<u>SCANLINK</u>	Scans the LINK environment variable
<u>SILENT</u>	Does not display linking status information
<u>STACK</u>	Defines stack segment and/or its size.
<u>STUB</u>	Adds a stub file to the executable
<u>TINY</u>	Generates a .com file
<u>UPPERCASE</u>	Converts all symbols to upper case
<u>VERSION</u>	Adds a version number to the executable
<u>WARNDUPS</u>	Warns of duplicate public symbols in .lib
<u>WINPACK</u>	Build compressed output utilizing decompressing loader
<u>XMSMAXSIZE</u>	Sets maximum XMS size
<u>XNOIGNORECASE</u>	Treats EXPORT and IMPORT symbols as case significant
<u>XREF</u>	Controls information content in .map file
<u>XUPPERCASE</u>	Forces EXPORT and IMPORT symbols to upper case
<u>?</u>	Like /HELP, displays available switches

## Unsupported Microsoft LINK Switches

OPTLINK does not recognize the following Microsoft LINK switches:

/DSALLOC  
/DYNAMIC

/HIGH  
/OLDOVERLAY  
/OVERLAYINTERRUPT  
/QUICKLIBRARY  
/r

OPTLINK parses and ignores the following Microsoft LINK switches:

/BATCH  
/CHECKABORT  
/CHECKEXE  
/NOEXTDICTIONARY  
/PADCODE  
/PADDATA  
/SEGMENTS  
/WARNFIXUP

## **Using OPTLINK Option Switches**

While this section supplies the full name of each option switch, you need to supply only enough characters to uniquely identify it. These option switches are not case significant. Either a "-" or a "/" must precede an option switch. "Default" shows OPTLINK's assumptions before encountering any option switch or directive.

## **ALIGNMENT**

Syntax: /ALIGNMENT:n

Default: /ALIGNMENT:16

Win32 default: /ALIGNMENT:512

In the segmented `.exe` format, the `ALIGNMENT` value determines maximum file size because segments and resources are referenced by a 16-bit page number. Page size is set by `ALIGNMENT`, so if `n` is left at its default value of 16, the maximum file size will be 16\*65535 bytes, or 1 megabyte. To increase the file size limit, increase `n`. The value specified must be a power of 2.

When generating a conventional MS-DOS `.exe` files, this switch causes the `.exe` file header to be rounded up to the specified page size. `n` is the file header alignment size in bytes. Defaulting to 16 allows for the smallest `.exe` file size. Other linkers use a page size of 512, causing unnecessarily large `.exe` files. Some `.exe` post-processors (notably EXE2BIN) may require you to retain the 512-byte header size. The value specified must be a power of 2.

## **BASE**

Syntax: /BASE:nn

Sets the base address of the executable image to the hexadecimal value nn.

## **BINARY**

Syntax: `/BINARY[:n]`

Causes OPTLINK to generate a `.sys` file instead of an `.exe` file.

The value `n` is the lowest address generated in the `.sys` file. If you want your `.sys` file to start with code at `8000H`, use `"/BI:0x8000"` to define the lowest address. Defaults to `0` when not supplied.

## BYORDINAL

Syntax: `/BYORDINAL`

For 32-bit output, `/BYORDINAL` causes OPTLINK to export symbols by ordinal.

For 16-bit output, causes OPTLINK to move the name text for every exported symbol, designated by `__export` in source code, from the RESIDENT name table (which requires Windows memory) to the NONRESIDENT name table. Effectively, this option reduces memory requirements and load times for 16-bit programs. It also allows you to export more symbols from 16-bit `.exe` and `.dll` files, since the file format allows a maximum `.exe` header size of 64Kb, and RESIDENT names are part of that header. The NONRESIDENT table can be 65,535 bytes in size.

Use `/BYORDINAL` with `/IMPDEF`, `/IMPLIB`, and `/NONAMES` to optimize the size and speed of your 16-bit code. However, any additional modifications to entry points can cause ordinal changes that effectively necessitate rebuilding the entire application. To minimize the impact of this problem:

- Rebuild the entire application using `/BYORDINAL`, `/IMPDEF`, `/IMPLIB`, and `/NONAMES`. `/IMPDEF` creates a `.din` file (a `.def` include file) for the module being built. `/IMPLIB` generates the DLL's `.lib` file.
- For all subsequent builds, include the `.din` file (via the directive `INCLUDE 'dinfilename'`) for the respective module, plus continue using all four of the above OPTLINK switches. This will eliminate ordinal problems by preserving the `.def` settings in the `INCLUDE'd` file.



## **CHECKSUM**

Syntax: / [NO] CHECKSUM

Default: / NOCHECKSUM

Parsed and ignored.

## CODEVIEW

Syntax: / [NO]CODEVIEW[:n]

Default: /NOCODEVIEW

Controls whether OPTLINK should include CodeView information within the output .exe file. CodeView expects such information to be present within applicable .obj files being linked.

OPTLINK includes any available CodeView information for all object modules unless the options /DEBUG, /DEBUGCOVERAGES, /DEBUGFILES, /DEBUGLINES, /DEBUGLOCALS, /DEBUGMODULES, /DEBUGPUBLICS, or /DEBUGTYPES are supplied.

n specifies the CodeView major version format desired (applicable only with /CODEVIEW). For CodeView 2.x, enter 2, for CodeView 3.x, enter 3, and for CodeView 4.x, enter 4. When you enter

/CODEVIEW without a number, OPTLINK uses the default. OPTLINK automatically performs the CVPACK step when you use 4.

## **COMDEFSEARCH**

Syntax: / [NO] COMDEFSEARCH

Default: / NOCOMDEFSEARCH

Specifies whether OPTLINK performs a library search if it encounters an undefined COMDEF record.

## **CPARMAXALLOC**

Syntax: /CPARMAXALLOC:n

Default: /CPARMAXALLOC:0xFFFF

Only valid when generating MS-DOS .exe files. This switch sets the maximum number, n, of 16-byte paragraphs needed by a DOS program to occupy when loaded in memory. This functionality is useful for reserving memory needed for other programs.

If the program requires more space, OPTLINK sets the allowable RAM usage to the actual amount required by the program. If you do not use this switch, OPTLINK sets the RAM requirement to its maximum possible value, causing the program to use all available RAM at run-time. Acceptable values are 1 to 65,535.

## **CVVERSION**

Syntax: `/CVVERSION:n`

Default: `/CVVERSION:4`

Enhance the Microsoft LINK drop-in replacement capability of OPTLINK. Your existing make files or other Microsoft LINK command sets may assume a different version of CodeView. By placing this switch in `optlinks.cfg`, you avoid making any changes to established make files.

`n` specifies the CodeView major version format desired (applicable only when using `/CODEVIEW`). For CodeView 2.x, enter 2, for CodeView 3.x, enter 3, and for CodeView 4.x, enter 4. When you enter `/CODEVIEW` without a number, OPTLINK uses the default. OPTLINK automatically performs the CVPACK step when you use 4.

## DEBUG Options

Syntax: `/[NO]DEBUG[modifiers]`

Enable you to selectively include and exclude debug information within the target program. OPTLINK lets you select debug information for the entire program, specific object modules (see also `/DEBUGMODULES`), specific object files, and specific library files (see also `/DEBUGFILES`). Additionally, you can selectively include or exclude the debug information itself (i.e. line numbers, local symbols, public symbols, and types). These switches can save recompiling to turn debugging information on and off in certain modules.

By default, when directed to output debug information, OPTLINK includes all debug information content. Use `/CODEVIEW` to inform OPTLINK of the desired debugger format.

If you supply no modifiers, the switch controls the inclusion of all debug information for any subsequently supplied files. You can also supply any of the following modifiers:

Supplying `/NODEBUG` turns off debug information generation. The switch must appear before selectively including debugging information for specific object files. For example:

```
LINK/CO:4/NODEBUG obj1 /DEBUGLINES obj2  
/DEBUG obj3;
```

This forces OPTLINK to output full CodeView v4.x debugging information for file `obj3` and only CodeView line number information for file `obj2`. It generates no debugging information for file `obj1`.

### LINES

Controls the inclusion of line number information in debug and map output for any subsequently supplied files.

### LOCALS

Controls the inclusion of local symbol information in debug output for any subsequently supplied files.

### PUBLICS

Controls the inclusion of public symbol information in debug and map output for any subsequently supplied files.

### TYPES

Controls the inclusion of type information in debug output for any subsequently supplied files.

Supplying `/NODEBUG` excludes debug information for specific object files. The switch must appear before selectively including debug information for specific files. For example:

```
LINK /CO:4 /NODEBUG obj1 /DEBUGLINES obj2 /DEBUG \ obj3;
```

This example generates full CodeView 4.x debugging information for file `obj3` and only CodeView line number information for `obj2`. No debugging information is generated for `obj1`.

**See Also**

[DEBUGMODULES](#)

[DEBUGFILES](#)

## DEBUGFILES

Syntax: /DEBUGFILES:filename[[ :filename]...]

Causes OPTLINK to include all debugging information from the selected files. This saves recompiling to turn debugging information on and off in certain modules or when your debugger can't handle all modules at once. Use /CODEVIEW to inform OPTLINK of the desired debugger format.

filename

File name to include debug information. OPTLINK includes debugging information in all object modules in the named object or library file. Any file name specified without an extension defaults to the extension `.obj`. You can enter multiple file names, but you must include complete paths and an additional blank before the colon, `:"myfile"`.



## **DEBUGMODULES**

Syntax: /DEBUGMODULES:modname [[:modname]...]

Causes OPTLINK to include all debug information from the selected object modules. This saves recompiling to turn debugging information on and off in certain modules or when your debugger can't handle all modules at once. OPTLINK includes only the named object modules from the file. Use /CODEVIEW to inform OPTLINK of the desired debugger format.

modname

Object module name(s) to include debug information.

## **DEFAULTLIBRARYSEARCH**

Syntax: / [NO] DEFAULTLIBRARYSEARCH [ :libname]

Default: /DEFAULTLIBRARYSEARCH

Controls how OPTLINK handles comment records in .obj file requesting a library search. The default setting causes OPTLINK to search all requested libraries. Otherwise, OPTLINK does no searching.

libname

Applicable only with /NODEFAULTLIBRARYSEARCH. Specifies a library not to be searched. For example,

"/NODEFAULTLIBRARYSEARCH:CLIBC" causes OPTLINK to ignore requests for CLIBC.LIB. You must provide a separate copy of the switch for each library name.

## **DELEEXECUTABLE**

Syntax: / [NO] DELEEXECUTABLE

Default: /NODELEEXECUTABLE

Controls whether OPTLINK should delete the .exe or .dll output file upon encountering any link error.

## **DETAILEDMAP**

Syntax: / [NO] DETAILEDMAP

Default: /NO DETAILEDMAP

Controls the amount of detail provided in the segment list produced at the beginning of the .map file. /DETAILEDMAP provides much more detail about segment type, which modules added, how many bytes to the segment, and where each module begins.

## DOSSEG

Syntax: / [NO]DOSSEG

Default: /NODOSSEG

Controls `.exe` file segment sequence. When used, the segment sequence is: segments with a class name ending in `CODE`, then all segments not included in `DGROUP`, and, lastly, all segments of `DGROUP` (which will in turn be sequenced as `BEGDATA`, except `BEGDATA`, `BSS` and `STACK`, `BSS`, and finally `STACK`). Otherwise, segments appear in the sequence in which they are encountered while linking.

## **ECHOINDIRECT**

Syntax: / [NO]ECHOINDIRECT

Default: /NOECHOINDIRECT

Controls the echoing of indirect response file input lines to the console.

## **EMSMAXSIZE**

Syntax: /EMSMAXSIZE:n

Default: /EMSMAXSIZE: uses maximum available

For 16-bit real mode hosted versions only. Controls the maximum number of kilobytes of EMS that OPTLINK uses. n set to 0 forces no EMS use.

## **EMSPAGEFRAMEIO**

Syntax: / [NO]EMSPAGEFRAMEIO

Default: /EMSPAGEFRAMEIO

For 16-bit real mode hosted versions only. Most EMS memory systems are reliable when doing I/O to their page frame. Not quite so rare are disk cache programs that assume they are the only ones using the page frame and thus become confused when another program does. If you use one of these programs, supply /NOEMSPAGEFRAMEIO to stop the linker from doing I/O in the EMS page frame area. Normally, /EMSPAGEFRAMEIO is the fastest operation.



## **EMSUSE40**

Syntax: `/[NO]EMSUSE40`

Default: `/EMSUSE40`

Controls whether OPTLINK adheres to LIM 3.2. Some EMS memory managers claim to be LIM 4.0 compatible but are not. If you encounter problems using EMS memory, try forcing the linker to comply to LIM 3.2 by supplying `/NOEMSUSE40`. If the problems go away, report the problem to your EMS driver vendor. This option is normally `/EMSUSE40` (LIM 4.0) for fastest operation.

## **ERRORFLAG**

Syntax: `/[NO]ERRORFLAG`

Default: `/ERRORFLAG`

Controls the setting of the error flag in a segmented-EXE or Win32 file header. When used, OPTLINK sets the flag when it encounters errors in the link process. Otherwise, OPTLINK does not set the flag even when it detects errors.

## **EXEPACK**

Syntax: / [NO]EXEPACK[:n]

Default: /NOEXEPACK

Causes OPTLINK to run-length encode the generated `.exe` output file to reduce its size. It also compresses relocation entries to produce much smaller `.exe` files, especially in medium and large memory models. The EXEPACK technique is fully compatible with the `/RC` option of OPTLINK. Microsoft's Resource Compiler is not compatible.

`n` is applicable only with `/EXEPACK` on DOS executables. It specifies how many bytes at the beginning of the memory image are not to be compressed. This permits easier maintenance of patch, configuration, serialization, and similar areas in the `.exe` file. The default value is 0.

## **EXETYPE**

Syntax: /EXETYPE:[OS2 | WINDOWS [n.nn] | DOS4 | UNKNOWN | DOS | NT]

Specifies the operating system under which the current executable file is to run. This option works like the EXETYPE definition file directive; see its description in the section "Definition File Directives" for information.

## **FARCALLTRANSLATION**

Syntax: / [NO] FARCALLTRANSLATION

Default: /NOFARCALLTRANSLATION

Causes far calls to targets in the same segment to be converted to the equivalent combination of `PUSH CS`, `NOP`, and `CALL NEAR`. This can improve code performance and reduce `.exe` file size, since it eliminates the need for relocation entries. It also converts far jumps where possible. Supplying `/FARCALLTRANSLATION` forces `/RELOCATIONCHECK`.

## **FIXDS**

Syntax: `/[NO]FIXDS`

Default: `/NOFIXDS`

This switch, applicable only to 16-bit Windows executables, does the same action as `FIXDS` directive in the `.def` file.

## **FIXED**

Syntax: /FIXED

Causes the executable image to be fixed in place in memory.

## **GROUPASSOCIATION**

Syntax: / [NO] GROUPASSOCIATION

Default: / GROUPASSOCIATION

Controls the use OPTLINK makes of GROUP information found in the .obj files. When used, OPTLINK uses all such information found in the files.



## **GROUPSTACK**

Syntax: / [NO] GROUPSTACK

Default: /NOGROUPSTACK

Controls stack definition in the standard DOS `.exe` file header. When used, OPTLINK writes values into the header in a group-based format that does not require your programs to modify the value of SS after loading. This action is not compatible with the output of most high-level languages; their startup code assumes that the stack is wrong, and adjusts it back into DGROUP. Thus, it is recommended to use this switch only with assembly language programs. Otherwise, OPTLINK writes these values in physical segment : *offset* form just as other linkers do, which effectively takes SS out of DGROUP.

## **HEAP**

Syntax: `/HEAP[:n, commit]`

Sets the size of the executable file's local heap to n bytes. This option works like the `HEAPSIZE` definition file directive, except that the `MAXVAL` keyword is not supported. See the description of `HEAPSIZE` in the section "Definition File Directives" for information.

## **HELP**

Syntax: /HELP

Displays a list of available switches. In the list, those characters required to identify each switch appear in uppercase, while characters appearing in lowercase are optional and may be omitted.

## **IGNORECASE**

Syntax: `/[NO] IGNORECASE`

Default: `/IGNORECASE`

Forces OPTLINK to preserve but ignore the cases of identifiers and symbols, including the optional symbol table that may be appended to the output file. Only one of `/IGNORECASE`, `/NOIGNORECASE`, `/LOWERCASE`, and `/UPPERCASE` can be in effect for any specific run of OPTLINK.

## **INFORMATION**

Syntax: /INFORMATION

Default: /SILENT

This switch causes OPTLINK to display status information throughout the link process. It is the opposite of /SILENT.

## **IMPDEF**



Syntax: `/IMPDEF[:dinname]`

Causes OPTLINK to generate a `.din` file that combines information from the EXPORTS section of the `.def` file with `__export` directives, `/BYORDINAL` or `/NONAMES` switches. `dinname` is the `.din` file to be generated.

Use `/IMPDEF` with `/BYORDINAL`, `/IMPLIB`, and `/NONAMES` to optimize the size and speed of your 16-bit code. See the description of `/BYORDINAL` for information.

**See Also**

BYORDINAL

## **IMPLIB**



Syntax: `/IMPLIB[:libname]`

Builds an import library (`.lib`) file describing the exported symbols available to be imported from a dynamic link library (`.dll`), thus eliminating the need to run a separate utility to build the library. `libname` is the import library to build.

Use `/IMPLIB` with `/BYORDINAL`, `/IMPDEF`, and `/NONAMES` to optimize the size and speed of your 16-bit code. See the description of `/BYORDINAL` for information.



**See Also**

BYORDINAL

## **INFORMATION**

Syntax: /INFORMATION

Default: /SILENT

This switch causes OPTLINK to display status information throughout the link process. It is the opposite of /SILENT.

## **LINENUMBERS**

Syntax: / [NO] LINENUMBERS

Default: /NOLINENUMBERS

Controls whether line-number information shall be contained within the .map file.

## **LOWERCASE**

Syntax: /LOWERCASE

Default: /IGNORECASE

Forces OPTLINK to convert symbols to lowercase. Only one of /IGNORECASE, /NOIGNORECASE, /LOWERCASE, and /UPPERCASE can be in effect for any specific run of OPTLINK.

## **MACHINE**

Syntax: /`MACHINE`:`type`

Specifies the type of the target machine. `type` can be `i386`.

## **MAP**

Syntax: / [NO]MAP [ :*modifiers*]

Default: /NOMAP

Causes the addition of public symbols to the `.map` file. The `/MAP` option normally outputs the symbol twice: sorted alphabetically and by increasing addresses. It accepts any of the following modifiers:

## **ADDRESS**

Outputs only the increasing address sort listing.

## **FULL**

Produces detailed maps as does the `/DETAILEDMAP` switch.



**GROUP**

Displays the GROUP column on the report.

## **NOGROUP**

Does not display the GROUP column. /MAP defaults to :NOGROUP.

## **NOCVPACK**

Syntax: `/NOCVPACK`

This switch suppresses automatic execution of the CVPACK step after a successful link for CodeView Version 4. This allows you to run Microsoft's CVPACK utility. By default, OPTLINK performs the CVPACK step when linking for CodeView 4.

## **NOLOGO**

Syntax: /NOLOGO

This switch suppresses OPTLINK's normally displayed sign-on copyright message, unless errors are detected.

## **NONAMES**



Syntax: `/NONAMES`

Eliminates storage of name text for symbols exported by ordinal. This option can shrink `.exe` or `.dll` files by up to 64K bytes for 16-bit files. It also eliminates the 64K limit on exported names text for 16-bit files.

Use `/NONAMES` with `/BYORDINAL`, `/IMPLIB`, and `/IMPDEF` to optimize the size and speed of your 16-bit code. See the description of `/BYORDINAL` for information.

**See Also**

BYORDINAL

## **NULLDOSSEG**

Syntax: /[NO]NULLDOSSEG

Default: /NULLSDOSSEG

Controls the generation of 16 null bytes at the beginning of the `_TEXT` segment in DOSSEG mode. The Microsoft run-time usually requires this.

## **ONERROR**

Syntax: /ONERROR:NOEXE

Default: /NODELEXECUTABLE

Causes OPTLINK to delete the .exe or .dll output file if any link error occurs. Normally the .exe file is not deleted upon an error.



## **OPT**

Syntax: /OPT

Uses OPTLINK syntax. Parsed and ignored.

## PACKCODE

Syntax: / [NO] PACKCODE [ :n]

Default: /NOPACKCODE

Causes OPTLINK to combine any segments of class name ending in CODE, to a maximum size of n bytes. The main purposes of this are:

- To improve operation of the /FARCALLTRANSLATION option, since more targets will be in the same segments, and
- To reduce the segment count for segmented .exe files. Some debuggers also function better when the segment count is kept low. /PACKCODE causes segments to be logically combined (packed) into larger physical segments.

**Note:** Applicable only with /PACKCODE is n: the maximum segment size of groups. /PACKSIZE controls the default value. Values of 8192 or 16384 may provide better performance for large applications because the segments being swapped, discarded, and reloaded are smaller.

## **PACKDATA**

Syntax: / [NO] PACKDATA [ :n]

Default: /NOPACKDATA

Causes OPTLINK to combine data segments if possible, to produce larger, but fewer, data segments. /PACKDATA causes segments to be combined (packed) into larger physical segments.

**Note:** Applicable only with /PACKDATA is n: the maximum segment size of groups. /PACKSIZE controls the default value. Values of 8192 or 16384 may provide better performance for large applications because the segments being swapped, discarded, and reloaded are smaller.

## **PACKFUNCTIONS**

Syntax: / [NO] PACKFUNCTIONS

Default: / PACKFUNCTIONS

Enables true smart linking of object files containing COMDAT records. OPTLINK retains only referenced COMDAT records. OPTLINK is fully recursive in this support; it removes unnecessary COMDATs and library modules from the executable.

## **PACKIFNOSEGMENTS**

Syntax: `/[NO]PACKIFNOSEGMENTS`

Default: `/PACKIFNOSEGMENTS`

Forces `/PACKCODE` on Windows output if the `.def` file does not use a `SEGMENTS` directive. MS-LINK has an undocumented feature/bug in which `/PACKCODE:65500` is enabled for Windows `.exe/.dlls` if the `.def` file does not use a `SEGMENTS` directive. This option is enabled by default for compatibility. You may want to disable it.

## **PACKSIZE**

Syntax: /PACKSIZE:n

Default: /PACKSIZE:65500

Sets the default size (in bytes) for the /PACKDATA and /PACKCODE switches.

## **PAGESIZE**

Syntax: `/PAGESIZE:n`

Default: `/PACKSIZE:16`

Sets the page size for the `/IMPLIB` link option. The default value is 16, which allows a `.lib` file of up to 1Mb in size. `n` must be a power of 2 greater than or equal to 16.

## **PAUSE**

Syntax: / [NO] PAUSE

Default: /NO PAUSE

Allows swapping of diskettes just before OPTLINK writes binary output data.



## **PMTYPE**

Syntax: `/PMTYPE:type`

Default: `/PMTYPE:PM`

This switch, used only when producing segmented executable or `.dll` output, requires one of three type specifiers.

## **PM**

The application is Windows or PM and can execute only in the Windows or PM environment. For Windows, this eliminates the need to use RC if there are no resources. This format is the default output from OPTLINK.

## **PROMPT**

Syntax: / [NO] PROMPT

Default: / PROMPT

Determines whether OPTLINK prompts for input if additional link switches were expected (that is, if no semicolon (;) appeared at the end of the list of switches).

## RC Options

Syntax: `/RC[options] [:filename]`

Provides an alternative to the RC statement in the `.def` files. The `.res` file is assumed to be the same primary name as the `.exe` or `.dll`. Effective only when the switch is supplied. You can specify multiple instances of `/RC`.

This switch accepts the same eight options (each preceded by "-", a hyphen) accepted by the RC directive in the `.def` file; They have the following meanings:

- e Creates a driver that uses EMS memory
- k Keep segments in `.def` file order; does not sort or create a fast-load section
- l Creates an LIM 3.2 EMS application
- m Sets multiple instance flag
- p Create a private library (`PRIVATELIB`).
- t Creates a protected-mode-only application (`PROTMODE`).
- 30 Tags the executable as requiring Windows 3.0 or later to run
- 31 Tags the executable as requiring Windows 3.1 or later to run

`filename`

The optional file name. You can use `/RC` without a *filename* to mark `.exe` or `.dll` files as valid Windows files (ignore the file-not-found warning that results). It also causes preload segment reordering to occur.

## **RELOCATIONCHECK**

Syntax: / [NO]RELOCATIONCHECK

Default: /RELOCATIONCHECK

This switch causes OPTLINK to do extra processing to ensure that no relocation overlaps occur. Although rare, such overlaps can occur under the following circumstances: when initializing common blocks in more than one module or ORGing back over a relocation item in assembly language or when a translator error occurs.

## **REORDERSEGMENTS**

Syntax: / [NO] REORDERSEGMENTS

Default: / NOREORDERSEGMENTS

Allows OPTLINK to perform segment reordering. First, it orders all grouped segments so that segments belonging to a particular group are contiguous. It then orders all non-grouped segments so that code segments (classes ending in CODE) are together, and, therefore, all data segments are together. This allows the maximum benefit from /PACKCODE and /PACKDATA.

## **SCANLIB**

Syntax: `/[NO]SCANLIB`

Default: `/SCANLIB`

Forces OPTLINK to scan the `LIB` environment variable for additional library paths. You can use the `LIB` environment variable to aid in the drop-in-replacement use of OPTLINK. This option works only in the `optlinks.cfg` file, since OPTLINK scans environment variables before scanning the command line.

## SCANLINK

Syntax: /[NO]SCANLINK

Default: /SCANLINK

Forces OPTLINK to scan the LINK environment variable for additional option switches. You can use the LINK environment variable to aid in the drop-in-replacement use of OPTLINK. When supplied, OPTLINK scans LINK before scanning the OPTLINK environment variable. This option works only in the `optlinks.cfg` file, since OPTLINK scans environment variables before scanning the command line.



## **SILENT**

Syntax: /SILENT

Default: /SILENT

This switch causes OPTLINK to suppress status information throughout the link process. It is the opposite of /INFORMATION.

## **STACK**

Syntax: `/STACK[:n, commit]`

Controls the stack size. If supplied, it also defines a stack segment (in DGROUP if you use /DOSSEG) if one isn't specified in the `.obj` file.

`n` specifies the size of the stack in bytes. You must specify this number; in 16-bit code it must not exceed decimal 65535.

## **STUB**

Syntax: `/STUB:filename` or `STUB:NONE`

Specifies a "stub" routine to be added to the output executable file to terminate its operation with a warning message. This option works like the `STUB` definition file directive; see its description in the section "Definition File Directives" for information.

## **TINY**

Syntax: `/TINY`

This switch causes OPTLINK to generate a `.com` file instead of an `.exe` file. The `.com` file automatically starts at offset `0100h` in the code segment. To generate memory image files that start at other locations, use the `/BINARY` option switch.

## **UPPERCASE**

Syntax: /UPPERCASE

Default: /IGNORECASE

Forces OPTLINK to convert symbols to upper case. Only one of /IGNORECASE, /NOIGNORECASE, /LOWERCASE, and /UPPERCASE can be in effect for any specific run of OPTLINK.

## **VERSION**

Syntax: /VERSION:nn[.mm]

Puts the specified version number in the executable file. nn is the major version number; mm is the minor version number.

## **WARNDUPS**

Syntax: / [NO]WARNDUPS

Default: /NOWARNDUPS

Forces OPTLINK to output warning messages upon encountering duplicate library symbols.  
Very useful in debugging complex applications.

## WINPACK

Syntax: `/[NO]WINPACK`

Compresses 16-bit Windows `.exe` or `.dll` output files and adds a decompressing loader to the file. `/WINPACK` typically decreases the size of `.exe` and `.dll` output files by 50%. This option requires the use of OPTLINK's `/RC` link option (rather than using other resource binders).

To obtain maximum compression:

- For best results, pack all the executable files and DLLs that make up an application.
- Turn off debug output.
- Use `/PACKDATA:0` for packing to full 64K data segments.
- Use the largest `/PACKSIZE` possible. 16K is good if you need small segments. 64K is best for compression.
- Use a smaller `/ALIGNMENT` size.
- Export and import by ordinal number, and eliminate name text. See the `/BYORDINAL` and `/NONAMES` link options.

If your application contains `.res` files, you must use OPTLINK to bind them to the packed executable. `/WINPACK`'s decompressing loader must be segment number 1 in an `.exe` or `.dll` file, leaving 253 segments available for the application (one less than without `/WINPACK`). All segments are compressed, so if some value or string is modified after linking (for example, a product serial number), it will have to be located somewhere other than a code or data segment, perhaps in a resource.

For DLLs that cross-reference one another (for example, A.DLL references items in B.DLL, and B.DLL references items in A.DLL), neither `DGROUP` nor the code segment containing the start address can contain references to a DLL it cross-references.

Since `/WINPACK` compresses segments and relocations but not resources, the output file may be made even smaller by running it through another compression program after linking.



**See Also**

BYORDINAL  
NONAMES

## **XMSMAXSIZE**

Syntax: /XMSMAXSIZE:n

Default: /XMSMAXSIZE uses maximum available

Controls the maximum number of kilobytes of XMS memory that OPTLINK uses. n set to 0 forces no XMS use.

## **XNOIGNORECASE**

Syntax: /XNOIGNORECASE

Default: /XNOIGNORECASE

Forces OPTLINK to treat EXPORT and IMPORT symbols as case significant. Only one of /XNOIGNORECASE and /XUPPERCASE can be in effect for any specific run of OPTLINK.

**Note:** By default, the case of IMPORT and EXPORT symbols is significant. (In previous versions of Symantec C++, the default was /XUPPERCASE.) If a working application now generates run-time errors pertaining to undefined symbols, the case of symbols in some modules or libraries might be mismatched. Try rebuilding the application using the /UPPERCASE option, or declare the EXPORT and IMPORT symbols in definition files the same way they appear in object files.

## **XREF**

Syntax: `/[NO]XREF`

Default: `/NOXREF`

Controls whether OPTLINK adds cross reference information to the `.map` file. That is, for every global symbol, OPTLINK lists the module name where defined, followed by every other module name that referenced it.

## **XUPPERCASE**

Syntax: /XUPPERCASE

Default: /XUPPERCASE

Forces OPTLINK to convert EXPORT and IMPORT symbols to upper case. Only one of /XNOIGNORECASE and /XUPPERCASE can be in effect for any specific run of OPTLINK.

## **? (question mark)**

Syntax: `/?`

Identical to `/HELP`. Displays a list of available switches. In the list, those characters required to identify each switch appear in uppercase, while characters appearing in lowercase are optional and may be omitted.

## Operational Modes

OPTLINK's available operational modes are: command line, interactive, and indirect file.

All input on the command line should be in a series of parameters. For the interactive mode at a console, use `link.exe`. Using indirect file operation, you can enter prompt-like responses into a file. The specific file name is passed to OPTLINK on the command line and thus read by OPTLINK for its linker input.

In all modes of operation, OPTLINK requires that you provide the same kinds of control information, in the form of OPTLINK commands. This section describes the methods by which your commands may be transmitted to OPTLINK.

## Command Line and Interactive Operation ▶

Command line operation of OPTLINK uses the following syntax:

```
LINK obj[, out[, map[, lib[, def[, res]]]]]
```

For interactive operation simply input `LINK` followed by any option switches, which are described later, and press Enter. OPTLINK then prompts you for responses (option switches may be entered after any response).

OPTLINK parameters include the following:

### **obj**

One or more input (`.obj`) file names. If multiple names are supplied, they may be joined by "+" characters or blank spaces, but the comma separates the four parts of the command line. If more names are required than are able to fit onto the command line, a "+" immediately before the end of the line makes the list continue to the next line.

You may use ambiguous names wild-card characters "?" and "\*" If specific names are preceded or followed by wild-card references, those modules specifically named will not be included twice. At the end of the input list, you may use specific data or a "+" character to invoke the default choices. If neither is supplied, operation switches to the interactive mode, and you are prompted for the remaining inputs. The "#" character tells OPTLINK to ignore the rest of the comment characters following on that line.

### **out**

Specifies the name for the output executable or dynamic link library. If no extension is supplied, an `.exe` file is generated; if the extension is `.com`, a `.com` file is created automatically, and if extension is `.sys`, a binary device driver format file is created. To skip this entry, cause OPTLINK to default to the executable type provided in a definition file or option switch, supply a comma or press the Enter key in the interactive mode. If no directive or option switch is supplied, the default file name (that of the first `.obj` file) with `.exe` extension will be created.

### **map**

The file name for `map` output. Using an Enter key while in the interactive mode suppresses all map output, unless previously configured with a `/MAP` suggested file name. See the related switch descriptions (`/MAP`, `/XREF`, `/LINENUMBERS`, or `/DETAILEDMAP`) for more information.

### **lib**

Searches in order one or more library names to resolve any symbols not defined in the input `.obj` files. You may use wild card references as you can with the `obj` entry. The libraries are searched in the order specified here. You may use the same separators as you used for the `obj` portion apply. You may use the "+" continuation character that comes before the end-of-line or before the comment (`#`) string to extend past the end of the line.

The `lib` entry may be either a single file name or a pathname (with trailing "\") to a directory containing the libraries.

OPTLINK searches library files in the order that they are presented to it: that is, those named on the command line, and then those referenced by embedded commands in object modules.

To locate each library file for which no path is specified, OPTLINK first searches the current directory followed by any paths specified in the `LIB` variable, and finally any paths named in the command line.

### **def**

The definition file name. Optionally supplied, this file contains program linking information. This file type and its contents are described later in this manual.

### **res**

One or more resource (`.RES`) file names. When supplied, OPTLINK performs the bind step of



the Resource Compiler while linking. This eliminates the need to use a Resource Compiler to combine resources to the output file.

Also like the .OBJ entry, wild-card references may be used. The libraries will be searched in the order specified. The same separators used for the obj portion apply, and the res entry may also be extended past the end of a line by means of the continuance character (+) immediately before the end of line or comment (#) string.

**See Also**

[OPTLINK Option Switch Overview](#)

## Examples of Command Line Operation

The simplest method of using OPTLINK is to provide only the name of the .obj file to be used and accept the default suggestions for all other parameters:

```
C> LINK DUMP;  
OPTLINK Copyright (C) Symantec Inc. 1989-94  
All rights reserved.
```

OPTLINK's sign-on copyright message is displayed on the console as shown above.

If the .obj file does not exist in the current directory or in any of the paths supplied by the environment variables, OPTLINK sends an error message:

```
C>LINK DUMPER;  
OPTLINK Copyright (C) Symantec Inc. 1989-94  
All rights reserved.  
DUMPER.OBJ  
Error 2: File Not Found DUMPER.OBJ
```

If you do not use a semicolon on a short command line, OPTLINK reverts to the interactive mode after all command line input is used, as the following examples indicate:

```
C>LINK DUMP,,MYMAP;  
OPTLINK Copyright (C) Symantec Inc. 1989-94  
All rights reserved.  
C>LINK DUMP,,MYMAP  
OPTLINK Copyright (C) Symantec Inc. 1989-94  
All rights reserved.  
Libraries and Paths: (.lib):  
Definition File: (.def):  
Resource Files: (.res)
```

## Examples of Interactive Operation

Use the Enter key at the Map File: prompt.

```
C> LINK
OPTLINK Copyright (C) Symantec Inc. 1989-94
All rights reserved.
OBJ Files: (.obj):curset
Output File: (curset.exe):
Map File: (.map):
Libraries and Paths: (.lib):
Definition File: (.def):
Resource Files: (.res)
```

Using the "+" and the "#" comment characters causes multiple responses at the OBJ Files: prompt:

```
C> LINK
OPTLINK Copyright (C) Symantec Inc. 1989-94
All rights reserved.
OBJ Files: (.obj):file1 + # this is the first object file
OBJ Files: (.obj):file2 +
OBJ Files: (.obj):file3 # this is the last
Output File: (file1.exe):myfile
Map File: (.map):
Libraries and Paths: (.lib):mylib
Definition File: (.def):
Resource Files: (.res)
```

If you prefer, use multiple file names on the same line:

```
C> LINK
OPTLINK Copyright (C) Symantec Inc. 1989-94
All rights reserved.
OBJ Files: (.obj):file1 file2 file3
Output File: (file1.exe):myfile
Map File: (.map):
Libraries and Paths: (.lib):mylib
Definition File: (.def):
Resource Files: (.res)
```

## **Indirect File Operation**

If your application requires more file names or option switches than the command line can hold, you can use indirect file operation to effectively eliminate any limit on the amount of information you can supply to OPTLINK. For most complicated applications, this is the best choice.

OPTLINK uses the following syntax for indirect file operation:

```
LINK @indirfile
```

After entering the "@" character, LINK parameters are:

### **indirfile**

The name of an indirect response file. During interactive operation at each prompt, the indirect response file has a number of text lines.

## Example of Indirect File Operation

If the file `lnklst` contains the following lines:

```
DUMP  
NEWEXE  
MYMAP;
```

then the following command lines are equivalent except that line length in an indirect file is unlimited, while DOS limits the command line to a maximum of 125 characters by DOS itself.

```
LINK @LNKLST  
LINK DUMP,NEWEXE,MYMAP;
```

It is legal to use combinations of indirect file operation and either command line or interactive operation. OPTLINK accepts more than one indirect file specification. There are only two constraints: the indirect files that are combined must result in a valid sequence of responses and cannot be nested more than 10 deep.

**Note:** It is possible for a valid file name to actually begin with the "@" character. To keep such a file from being erroneously recognized by OPTLINK as an indirect response file, enclose the entire name of the file in quotation marks.

## Command Formats and File Names

All three methods of providing command input use exactly the same format for input information.

### File name usage

OPTLINK uses the same file-naming conventions as those supplied by the host operating system.

If a file extension is supplied, it must be separated from the name by a period. If none is supplied, OPTLINK assumes or creates a default value as described below.

The file name may be preceded by a pathname, which may be either absolute or relative and may include a drive specifier. If no path is specified, OPTLINK searches only the current working directory for the file or creates it in the current working directory. If a drive is specified, but no path, only the current directory for the specified drive is used.

### Default file extensions

If the file extension is omitted from a file name, OPTLINK assumes or creates a default extension for the file that is determined by the command with which the file name is associated. For instance, the default extensions for the file names supplied with the `OBJ Files:` prompt is `.obj` and for the `Map File:` prompt is `.map`. The defaults follow and are described later for each command that assumes or creates one. If you must refer to a file that has no extension and do not want a default to be used, you should add the `."` separator after the file name to tell OPTLINK not to supply an extension.

### File name extensions

Extension	Used for
<code>.def</code>	Definition file describing desired output
<code>.exe</code>	Executable files created by OPTLINK
<code>.lib</code>	Library files
<code>.map</code>	Listing of addresses generated by OPTLINK
<code>.obj</code>	Object files (in OMF format)
<code>.cfg</code>	Configuration file for default OPTLINK settings
<code>.res</code>	Resource files
none	Indirect command file used by OPTLINK

### Special file names

Since OPTLINK uses standard DOS functions for keyboard input and screen output, you may use device names in place of file names and you may redirect input and output. The device names are:

### Device names

Name	Device
AUX	refers to an auxiliary device (usually the same as <code>COM1</code> )
CON	refers to the console (keyboard input or display output)
PRN	refers to the printer (usually the same as <code>LPT1</code> )

NUL            a null (nonexistent) file; if given as an  
                 input name, returns end-of-file; if given as  
                 an output name, no output is generated

To redirect OPTLINK input and output from and to files, use the standard redirection keys. For example, the following command redirects OPTLINK output (including all prompts) to file `link.log` instead of to the screen:

```
LINK UTILITY; > LINK.LOG
```





## Build an Import Library: IMPLIB

You use IMPLIB to create an import library. An import library lets you import a function implicitly when you link an application with a DLL. An import library consists of a symbol table that the linker uses to define the locations of the functions in the DLL that are to be implicitly imported.

### IMPLIB Command Syntax

IMPLIB commands have the following format:

```
implib [/system] libfile.lib deffile.def
```

`libfile.lib` is the name of the import library file you want to create. `deffile.def` is the name of the DLL's module definition file.

You use the `/system` switch to create import libraries from Windows NT system DLLs (for example, `kernel32.dll`). Note that this switch is not available via the IDDE.

IMPLIB creates an import library for the DLL whose name matches `deffile`. When you link the application, list the import library along with the other libraries it uses.

## Analyze Library and Object Files: LIBUNRES

Use LIBUNRES to check the names of symbols in library and object files. For example, you can run LIBUNRES with the `-p` option to obtain a list of the mangled names of functions in a DLL.

### LIBUNRES command syntax

LIBUNRES commands have the following format:

```
libunres [switches] file
```

file is the name of the library or object file you want to analyze. You can specify more than one file. The switches specify what you want to find out about the file(s):

### LIBUNRES switches

Switc	Description
-------	-------------

**h**

- |    |                                                               |
|----|---------------------------------------------------------------|
| -c | Handle COMDAT records.                                        |
| -e | Print the names of all <code>extern</code> objects to stdout. |
| -i | Become case-insensitive.                                      |
| -l | Print symbol names to stdout.                                 |
| -p | Print the names of all public and common symbols.             |

By default, LIBUNRES lists the names of all `extern` symbols that are not public or common.

## Disassembling Object Files: OBJ2ASM

OBJ2ASM disassembles object files compiled with Symantec C++ or MASM. If you compile the file with the `-g1` option, OBJ2ASM mixes the source code and assembler instructions so that you can tell which statements produce which instructions. If you compile the file with the `-g` option, OBJ2ASM prints a listing of the file's debug records.

**Note:** You must edit the output of OBJ2ASM before you can use it with an assembler.

### OBJ2ASM command syntax

OBJ2ASM commands have the following format:

```
obj2asm [-l -o] [-soutfile] objectfile [.obj] [sourcefile]
```

The `objectfile` is the object file to disassemble. If you don't specify an extension, OBJ2ASM uses the extension `.obj`. The `sourcefile` is the file compiled to produce the object file. If you don't specify the `sourcefile`, OBJ2ASM looks at the module header information in the object file to determine the source file name.

The `-l` option tells OBJ2ASM to omit code labels in the assembly language file it generates. Use this option when you are comparing two object files; it helps highlight the differences between them. The `-o` option directs it to emit object code for each assembly language instruction. The `-x` option lets you show the code segment offset for each instruction. The `-s` option lets you direct OBJ2ASM's output to a file; the default is the standard output.

### Example

To see the code generated by compiling `test.cpp`, use the following commands:

```
sc -c -g1 test
obj2asm test > test.asm
```

## **Unmangling Identifier Names: UNMANGLE**

The UNMANGLE utility unmangles identifier names in map and executable files. This utility is available in source code form in the distribution directory `\sc\src\ctools`.

### **UNMANGLE command syntax**

UNMANGLE commands have the following format:

```
UNMANGLE file
```

The file can be a text, linker map, or binary file. UNMANGLE writes its output to STDOUT by default.

