Improv Basics for New Users How Do I?	Highlights of getting started in Improv and completing your tasks
Improv for 1-2-3 Users	Information on 1-2-3 equivalents in Improv
Formula Basics	Concepts and terms for using formulas
Functions	A lexicon of Improv functions
Improv Commands	A list of Improv commands
Script Help	LotusScript command reference
Chart Help	Lotus Chart Help
Support	Lotus product support

When you are using Improv, press F1 to display Help

Commands	Action
New Open Close	Creates the first worksheet in a new model. Opens and closes an existing model. Imports a spreadsheet or text file
Save Save As Revert to Saved	Saves the contents of a model in a file. Reverts to the last saved version of the model. Exports a model
Send Mail	Sends a Notes or cc:Mail message and attaches an Improv model
Print Preview Page Setup Print Print Setup	Prints the contents of a file according to your specifications
Exit	Exits Improv

Displays the default worksheet or opens the model you specify as the Startup model in the Default Paths dialog box (Tools User Setup). The new file has a default name, Untitled

Procedure

Allows you to

- build the first worksheet of a new model

  A new, default worksheet contains two categories (Category A, Category B), each with an item (Item A1, Item B1)
- simplify building a model by starting with a template. A custom template can include one or more worksheets, views, scripts, and presentations. If you save a file and specify it as the startup file (Tools User Setup: Paths), the file is automatically opened as a template each time you choose File New. The new file has the default name Untitled

See Also

Tools User Setup: Paths: to specify the file name of the startup model (template)

Creating a template: to create a template that is used as the startup model

Creating a suite of templates: to create a suite of templates

Create Worksheet: to add a new worksheet to an existing model; differs from File New

Create View: to create a new view of a worksheet in a model

Create Script: to create a new script

Create Presentation: to create a new presentation in a model

Creates a new, unnamed file in which you save the contents of an Improv model: worksheets, views, presentations, and scripts

Tip **Procedure**

1. Choose File New
   Improv displays a new worksheet. If you specified a startup model (Tools User Setup: Paths), Improv displays that model
2. Choose File Save to save the contents of the model in a file

Adding to your file

Before you save your model, you can add

- more worksheets (Create Worksheet)
- multiple views of worksheets (Create View)
- charts (Create Chart)
- presentations (Create Presentation)
- scripts (Create Script)

See Also

File Save: to save a new file

Creating a template: to create a template that is used as the startup model

Opens an existing file that contains an Improv model or imports other spreadsheets or text files

Procedure

Allows you to

- open an Improv file (.imp) that contains all the worksheets, views, scripts, and presentations for the model, which is preserved in its last saved state
- open LotusScript library files (.lss)
- import into an Improv model a 1-2-3 spreadsheet, saved in .wk1, .wk3, or .wk4 format
- import a version 4.0 Excel spreadsheet (.xls), an Improv 1.0 model (.imx), or a Text file (.txt)

See Also

File New: to create a new file for a new model; differs from File Open

File Save: to save a new file or save changes to a previously saved file

Importing a worksheet: to import a 1-2-3 or Excel spreadsheet

Create Worksheet: to add a new worksheet to an existing model

Displays the Open dialog box to open an existing model or a script file, or to import a file saved in .xls, .wk1, .wk3, .wk4, or .txt format

Tip **Procedure**

1. Choose File Open
   Improv displays the Open dialog box
2. Select the file you want to open from the Drives, Directories, and File Name lists
3. Select a file type from List Files of Type
4. Click OK to open the selected file

See Also

File New: to create a new file

Importing a spreadsheet: to import a spreadsheet and specify how to represent it as an Improv worksheet

Importing a text file: to import .txt files as text

LotusScript Help: to learn more about LotusScript. To open the Script Help file, choose Script Help from the main Help menu or press F1 when you are using a script

To specify how to import a 1-2-3 or Excel spreadsheet in one of two ways: import the entire worksheet, or import a range

Improv displays the Worksheet Import dialog box when you select a file with the extension .wk1, .wk3, .wk4, or .xls

---

Tip **Procedure**

1. Choose File Open
   Improv displays the Open dialog box
2. Click the List Files of Type box to display a list of file types
3. Click the file type you want to import: 1-2-3 (*.wk3), 1-2-3 (*.wk1), 1-2-3 (*.wk4), Excel (*.xls)
4. Choose the file you want to import from the Drives, Directories, and File Name boxes. Click OK
   Improv displays the Worksheet Import dialog box
5. Choose how you want to import the spreadsheet

   Import
   As a new model: creates a new model for the imported data, ready to be saved in a new file
   As worksheets added to current model: creates a new worksheet in the active Improv model to hold the imported data

   Import Ranges
   Entire spreadsheet: the default entry. Imports all the spreadsheet data and creates a new worksheet to hold it
   One or more range names: Imports specific ranges. Improv creates one worksheet for each range it imports

   Add cell range
   You can add import ranges to the list by typing a range address in the text box. Use 1-2-3 or Excel syntax

   Options
   Create item names from labels
   Checked: creates item names from any labels in the top row and left column
   Unchecked: labels row items 1, 2, 3; labels column items A, B, C
   Delete blank rows and columns
   Checked: drops blank rows and columns
   Unchecked: imports all blank rows and columns
   Import Formulas
   Checked: imports both cell formulas and values
   Unchecked: imports only cell values, not the formulas that calculate them
   Import Linked Files
   Checked: imports all files linked to the file as separate worksheets
4. Click OK to import the worksheet as specified

See Also

Importing a text file: to import files saved in Text format (.txt)

File New: to create a new file for a model

To import files saved in Text format (.txt). Improv displays the Text Import dialog box to specify how you want the file imported

Tip **Procedure**

1. Choose File Open
   Improv displays the Open dialog box
2. Select the file you want to import from the Drives, Directories, and File Name lists
3. Select the text file type from the List Files of Type list
4. Choose how you want to import the text

   Import

   As a new model: creates a new, unnamed file for the imported text

   As a worksheet added to current model: creates a new worksheet in the current model

   Options

   Use first row for item names: uses the text fields in the first line of the text file as column item names

   Use first column for item names: uses the first text field in subsequent lines as row item names

   Delimiter

   Tab, Space, and Comma are the standard field separators. If you used another character as a field separator, choose Other and type in a character

   You can use only one character as a delimiter

   Note: Improv uses carriage return line feed as end-of-record delimiter
5. Click OK to import the text file as specified

See Also

Importing a worksheet: to import a 1-2-3 or Excel worksheet

Closes the file that contains the current model. If the file is not named or if you made changes since the last save, Improv displays an alert box that asks if you want to save before closing

Procedure

Allows you to

- close all the windows of a model in one step without ending your Improv session

See Also

File Save: to save a file or to save changes to a previously saved file
File Save As: to save a file under a new name
File Revert to Saved: to close the file without saving changes and open the last saved version
File Exit: to close the Improv application; differs from File Close

Closes the current file, alerting you if there are unsaved changes and prompting you to save

Procedure

1. Choose File Close

   If there are unsaved changes to the file, Improv displays an alert box asking if you want to save changes

   If no changes have been made to the file since the last save, Improv closes all the windows of the model

2. If there are unsaved changes, choose one of the options in the alert box

   Yes: to save the changes to a previously saved file or display the Save panel if the file has not been saved

   No: to close the file without saving it

   Cancel: to close the alert box, cancel the Close, and return to the current model

   Explain: to display a message

See Also

File Save: to save a new file, or save changes to a previously saved file

File Save As: to save a file under a new name

File Revert to Saved: to close the file without saving changes and open the last saved version

File Exit: to close the Improv application; differs from File Close

Exporting a worksheet: to export an Improv worksheet to another file format

Saves the current model and writes the changes to disk if you saved the file before. If you did not save the file before, Improv displays the Save dialog box

Procedure

Allows you to

- save a model, its worksheets, presentations, and scripts in the Improv binary format (.imp), ready for the next Improv work session
- export a model to the following file formats:

  Lotus 1-2-3 (*.wk3), Lotus 1-2-3 (*.wk4), and **1-2-3 (*.wk1):** to export to Lotus 1-2-3 for DOS, Lotus 1-2-3 for Windows, and Lotus 1-2-3 for Mac

  Excel (*.xls): to export to Excel Release 4.0 file format

  Text (*.txt): to export to Text files

  Improv text (*.imx): to export Improv worksheets to Improv 1.0 (NeXT)

  Script files (*.lss): to export model scripts only

See Also

File Save As: to save a file under a new name

File Revert to Saved: to close the file without saving changes and open the last saved version

File Close: to close the file. Improv reminds you to save any changes

Saves the current model and writes the changes to disk

Tip **Procedure**

1. Choose File Save
2. Select the file you want to save from the Directories, Drives, and File Name lists
3. Select a file type from Save File as Type

   The default is Improv (*.imp), which saves the file as an Improv file

   If you choose 1-2-3 (*.wk3), 1-2-3 (*.wk1), 1-2-3 (*.wk4), or Excel (*.xls), Improv displays the Worksheet Export dialog box

   If you choose Text (*.txt), Improv displays the Text Export dialog box

   If you are saving a script, LotusScript (*.lss) saves the script directly to the Scripts directory
4. Click OK

See Also

File Save As: to save the current model under a new file name

Exporting a worksheet: to export an Improv file to a Lotus 1-2-3, or Excel format

Exporting a text file: to export an Improv file to a text file

To export an Improv worksheet. Displays the Worksheet Export dialog box when you choose the .wk1, .wk3, .wk4, or .xls format from the Save File as Type list in the File Save or File Save As dialog box

---

Tip **Procedure**

1. Choose File Save (for a new, unsaved file) or File Save As (for a previously saved file)
2. Specify a file name from the Directories, Drives, and File Name lists, and the file type from the Save File as Type list
3. Choose how you want to export the worksheet

   Export
   Cell contents: exports cell values
   Formulas: exports formulas and cell values
   Item names: exports item names to cell labels in the resulting spreadsheet

   Scope of Export
   Current view: exports only the current view
   Open views: exports all open views in the current model
   Entire model: exports one view of each worksheet in the model

   Intersheet Formulas
   Treat as error: displays an alert box to cancel the export if there are intersheet formulas
   Replace with @ERR: replaces the formula with @ERR
   Replace with values: replaces the formula with the resulting value

   Sheet Layout
   Diagonal: pages or worksheets are laid out in a diamond pattern
   Vertical: pages or worksheets are tiled vertically
   Horizontal: pages or worksheets are tiled horizontally

   Export as Type
   Specify the version of 1-2-3 to which you want to export. Choose:
   Lotus 1-2-3 DOS or Windows (*.wk3, *.wk4)
   Lotus 1-2-3 for Mac (*.wk3)
4. Click OK to export the Improv worksheet as specified

See Also

Exporting a text file: to export an Improv file to a text file

File Save: to save changes to an existing file, or to name and save a new file

File Save As: to save changes under a new file name

Appears when you choose .txt file format from the File Type menu in the File Save or File Save As dialog box

Tip **Procedure**

1. Choose File Save (for a new, unsaved file) or File Save As (for a previously saved file)
2. Specify a file name from the Directories, Drives, and File Name lists, and the file type (Text (*.txt)) from the Save File as Type list
3. Choose how you want to export the text

Export

Styles: exports numeric formats of the exported data
Item Names: exports item names as the first field in each row or as field heads in the first record
View Separator: inserts a blank line in the exported file between views

Scope of Export

Current view: exports only the current view
Open views: exports all open views
Entire model: exports the first view of each worksheet in the model

Delimiter

Click the character you want to use in the text file as a field separator. Tab, Space, and Comma are the standard field separators. Choose Other, and type in one character to use as a field separator

See Also

Exporting a worksheet: to export an Improv file to a Lotus 1-2-3, or Excel format
File Save: to save a file or to save changes to a previously saved file
File Save As: to save a file under a new name

Saves the current model under a new file name

Procedure

Allows you to

- keep different versions of a file to experiment with different solutions
- archive copies of a model
- export .imp files to 1-2-3 and Excel
- save Improv model scripts as stand alone scripts (.lss files)
- export worksheets, views, or scripts to a text file
- save worksheets as an Improv 1.0 (.imx) file

See Also

File Save: to save a new model or changes made to an existing model since the last save

Saves the current model under a new file name

Tip **Procedure**

1. Choose File Save As
2. Select the file you want to save from the Directories, Drives, and File Name lists
3. Select a file type from Save File as Type

   The default is Improv (*.imp), which saves the file as an Improv file

   If you choose 1-2-3 (*.wk3), 1-2-3 (*.wk1), 1-2-3 (*.wk4), or Excel (*.xls), Improv displays the Worksheet Export dialog box

   If you choose Text (*.txt), Improv displays the Text Export dialog box

   If you are saving a script, LotusScript (*.lss) saves the script directly to the Scripts directory
4. Click OK to save the selected file

See Also

File Save: to save a new model and name it, or to save the changes to an existing model

Exporting a worksheet: to export an Improv file to a Lotus 1-2-3, or Excel

Exporting a text tile: to export an Improv file to a text file

Closes the model or script library file without saving any changes made since the last save, and automatically opens the last saved .imp or .lss version

Allows you to

- experiment with a model, discarding the changes you made since the last save

See Also

File Save: to save a new file or to save changes to a previously saved file

File Save As: to save a model under a new file name

File Close: to close a file. Improv prompts you to save the file

Creates and sends Notes or cc:Mail messages from within Improv

Procedure

Allows you to

- attach the current Improv file to a Notes or cc:Mail message

See Also

Edit Copy: to copy and paste the selection you want to attach to a mail file

Window Browser: to cut and copy views, presentations, and scripts to paste them into a new model for attaching to an Email

Controls sending Email from Improv through any of the Lotus mail systems. Requires cc:Mail for Windows (Release 1.2 or higher), or Lotus Notes (Release 2.1 or higher)

Tip **Procedure**

To send a message

1. Choose File Send Mail
   Improv displays the Send Mail dialog box
2. Click OK to send a new mail message without an attachment

To send a message with an attachment

1. Choose File Send Mail
   Improv displays the Send Mail dialog box
2. Check Attach to attach the active model to the mail message
   Improv displays the name of the current file. If the file has not yet been saved, Improv prompts you to save the file
3. Click OK
   If Notes or cc:Mail is not running, and you have a password for your user ID, a dialog box appears
4. From the dialog box, enter your Notes or cc:Mail password and click OK
5. Address the mail and add an optional memo
6. Click Send to send the mail message and the attached model

See Also

Edit Copy: to copy and paste the selection you want to attach to a mail file

Window Browser: to cut and copy views, presentations, and scripts to paste them into a new model for attaching to an Email

Displays a window containing a scaled image of the pages the Print command will print

Procedure

Allows you to

- see what the page looks like before you print it. You can print a worksheet, script, or presentation from the Print Preview dialog box
- zoom the display in and out
- try a variety of page setup options and formats on the screen before investing time and paper in printing

See Also

File Page Setup: to control how information is displayed on the printed page

Worksheet Style: to format information in the worksheet

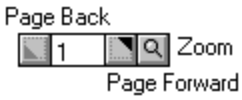
File Print: to specify what you want to print

To display a scaled image of the pages specified in the Print command

Procedure

1. Choose File Print Preview
   The scaled image of the first page to be printed appears
2. Improv displays the Print Preview dialog box. Choose from the options:
   Print: displays the Print dialog box to specify Print Range and Print Quality. Select the appropriate options and click OK to print the page

   Page Setup: displays the Page Setup dialog box to specify content, layout, margins, and orientation
3. Click the Page Forward or Page Back button or enter the page number to preview another page
   Move the cursor over the page and click to zoom in on a specific area. Click again to zoom out, or click the Zoom button



4. Choose Close to close the preview window without printing

See Also

File Print: to specify what you want to print

File Page Setup: to specify the content, layout, margins, and orientation of the page to be printed

Controls the settings for the view, script, or presentation

Mouse shortcut: click the Page Setup icon

Specifying worksheet layout: to set the options when a view is selected

Specifying presentation and script layout: to set the options when a presentation or script window is selected

---

Allows you to

- specify how the data is laid out
- maximize the use of the printed page by modifying the scaling, margins, and page orientation

---

See Also

File Print: to print the selected view, script, or presentation

Previewing before printing: to display a scaled image of the pages you want to print

Specifies the content and layout of the worksheet on the printed page

Tip Procedure

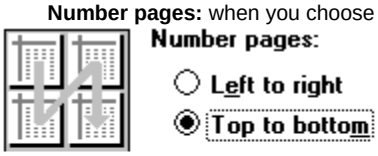
1. Make sure a worksheet is the active window
2. Choose File Page Setup
   Improv displays the Page Setup dialog box, which controls the content, layout, margins, orientation, print size, first page numbers, and headers and footers
3. Choose the options from the Page Setup dialog box

   Content

   Data pane: to print only the data pane
   Formula pane: to print only the formulas
   Check both Data pane and Formula pane to print data and formulas on separate pages
   Both panes on same page: to print both the data pane and formula pane on a single page

   Layout

   Print item names on: choose item names printed on all pages, or save space and print them only on the top and left pages
   Number pages: when you choose one of the Number pages options; the icon reflects your choice



   Margins

   Margin values: double-click to edit. The values are represented in the units set in the User Setup dialog box
   Center vertically: to center the worksheet vertically within the margins
   Center horizontally: to center the worksheet horizontally within the margins

   Orientation

   Check Portrait or Landscape orientation for the printed page

   Print Size

   Reduce or enlarge: to size the printed view. Minimum:10% Maximum:1000%.
   Fit to Page: to print the worksheet view on a single page whenever possible

4. Click OK to apply the settings

See Also

Tools User Setup: Font, Summary, Overlap, Units Options: to control the default font, automatic group summary, overlap information, and units of measurement

Previewing before printing: to inspect the layout of the page in a scaled-down image

Specifying headers and footers: to add or edit header and footer information for the page

Specifying presentation and script layout: to specify the layout of a presentation or script on the printed page

Specifies the layout of the script or presentation on the printed page

Tip Procedure

1. Make a presentation or script the active window
2. Choose File Page Setup
   Improv displays the Page Setup dialog box, which controls the margins, orientation, print size, first page number, and headers and footers
3. Choose the options in the Page Setup dialog box
   Margins
   Type in the margin values using the units selected in User Setup
   Orientation
   Choose Portrait or Landscape orientation
   Print Size
   Reduce or enlarge the size of the printed view. Minimum:10% Maximum:1000%
4. Click OK to apply the settings

See Also

Specifying headers and footers: to add or edit header and footer information for the page

Tools User Setup: Font, Summary, Overlap, Units Options: to control the default font, automatic group summary, overlap information, and units of measurement

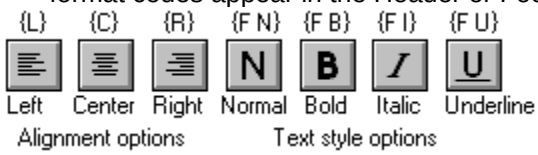
Previewing before printing: to inspect the layout of the page in a scaled-down image

Specifying worksheet layout: to specify the content and layout of a worksheet on the printed page

Allows you to type your own header and footer and choose a format, or allows you to choose automatic text options, such as date, time, page numbers, and model name for printed page headers and footers

Tip **Procedure**

1. Choose File Page Setup
2. Click the Header/Footer button
3. Position the cursor and type the text you want in the Header or Footer box
4. Choose the style attributes or automatic text options you want from the icons and Text marker box
   To use the icons: move the cursor to the Header or Footer box. Click the appropriate icon. The format codes appear in the Header or Footer box



   To use the Text Marker box: move the cursor to the Header or Footer box. Click the Text Marker box to display a list of options. Click the appropriate option. The option character appears in the Header or Footer box

   Page Number {#} inserts the page number. The footer default is {C} Page {#} . Improv centers the word Page and the page number on the page
   Current Date {D} inserts the current date. Updates automatically each time you print
   Current Time {T} inserts the current time. Updates automatically each time you print
   View Name {V} inserts the name of the view
   Worksheet Name {W} inserts the name of the worksheet, presentation, or script
   Model Name {M} inserts the name of the model (the file name without path)
   File Name {N} inserts the name of the file, including the path name
   Total Pages {P} inserts the total number of pages

   The elements appear on the printed page in the order in which you entered them

   Use the Delete or Backspace key to delete. Use cut (Ctrl+X) and paste (Ctrl+V) to reorder the elements in the Header/Footer windows

6. Choose the font name and font size from the Font list
7. Click OK to add header or footer information to the page

See Also

Specifying worksheet layout: to control the other page setup options

Displays the Print dialog box with options for printing the contents of an Improv window

Keyboard shortcut: Ctrl+P

Mouse shortcut: Click the File Print icon in the SmartIcons set

Procedure

Allows you to

- print several views of a worksheet for comparison and analysis
- print an entire worksheet, script, or presentation
- print to files for use with Email
- change print quality for faster printing of draft copies
- modify printer setup options
- collate the pages while printing
- print selected pages of data instead of the entire worksheet

See Also

Previewing before printing: to display a representation of the page before printing
File Page Setup: to specify the layout of a printed page
File Print Setup: to select a printer, page orientation, and paper size

Displays the standard Print dialog box for Windows

Procedure

1. Choose File Print
2. Check that the printer is the one you want

   Improv displays the name of the selected printer. To change printers, click Setup... to display the Print Setup dialog box, where you can change the printer, page orientation, or paper settings
3. Choose what you want to print (Print Range)

   All: prints all the pages

   Selection: prints the current worksheet selection (not valid for presentation or script)

   Pages: prints the specified pages. Enter a number in the From and To boxes
4. Choose the Print Quality from the list
5. Enter the number of copies to be printed in the Copies box
6. Check Print to File if you want to print to a file

   Improv displays the Print to File dialog box. Enter a file name in the Output File Name box. Click OK to send the output to a file
7. Check Collate copies if you want the pages to be collated as they are printed
8. Click OK to print using the settings

See Also

File Print Setup: to select a printer, page orientation, and paper size

File Print Preview: to display a window containing a scaled image of the pages the Print command will print

Displays the standard Windows Print Setup dialog box (version 3.1). Specifies the default printer, page orientation, paper size, paper source, and other available printer options

Procedure

Allows you to

- customize the page layout. For instance, you might want to print information in Landscape orientation to display more columns

See Also

File Print: to print the contents of the main window

Specifying worksheet layout: to control the settings for the worksheet

Specifying presentation and script layout: to control the settings for presentations and scripts

Displays the standard Windows Print Setup dialog box (version 3.1)

Tip **Procedure**

1. Choose File Print Setup to display the Print Setup dialog box
2. Choose a Printer
   Click Default Printer, or choose a Specific Printer from the popup list
3. Click Portrait or Landscape orientation
4. Choose the Size and Source from the popup lists under the Paper options
5. Click OK to accept the changes to the printer setup, or click Cancel to close the dialog box without changing it

Closes all the windows in each open model and exits Improv. If any of the files were not named or if changes were made since the last save, Improv displays a dialog box that asks if you want to save before closing

---

Allows you to

- end your Improv session without having to save any windows unnecessarily. Improv prompts you only to save changed or unnamed files

---

See Also

File Close: to close the file containing the current model; differs from File Exit

File Save: to save the current model

File Save As: to save the current model under a new file name

Displays the last five files that you used

Allows you to

- open or display a file from the list of files most recently used

See Also

File Open: to open a previously saved file

Command	Action
Undo Redo	Removes the effect of the last operation
Cut Copy Paste Paste Special	Moves items, cells, formulas, text, and worksheets by cut, copy, and paste operations
Add Add Item Add Category Add Formula Clear Cells Delete Item Delete Category Delete Formula Delete View	Adds and deletes items, cells, categories, formulas, views, and worksheets
Select All Select Item Names Select Cells Only	Selects all text, formulas, or model elements. Selects only item names or cells

Edit Undo cancels the last operation. If the last operation cannot be undone, Undo appears gray on the menu

Edit Redo appears on the menu after an operation is undone. Choose Redo to cancel the last Undo

Allows you to

- recover from unintentional deletions. Deleted information is replaced without consequence
- peel off information that was pasted in the wrong place
- experiment with a format change, knowing that you can undo the effect if it is not what you want

See Also

File Revert to Saved: to discard the changes made since the last save
Edit Cut: to cut a selection from the worksheet to the clipboard
Edit Delete Item: to delete an item selection from the worksheet
Edit Paste: to paste a selection from the clipboard

Removes the current selection and places it on the clipboard, replacing the contents of the clipboard

Keyboard equivalent: Ctrl+X

Procedure

Rules

Allows you to

- delete text, such as manually entered text in cells, or delete a formula in the formula pane
- edit a selection. For instance, you can make corrections to item and category names, manually entered cell values, and formula text
- move a selection. You can cut items and their cells from one location, select a new location in the same worksheet or in a different worksheet, and paste them

  You can cut and paste formulas to reorder them or to reposition them in another worksheet. You can cut a worksheet, view, presentation, or script from one model (using the Browser), and paste it in another model

---

See Also

Edit Paste: to paste the contents of the clipboard

Editing your work: to replace or modify values in cells, edit formulas, and change item or category names

Window Browser: to cut and paste worksheets, views, presentations, and scripts from one model to another

Edit Delete Item: to permanently remove an item selection from a worksheet; differs from Edit Cut

Worksheet Collapse Group: to display only the summary item without cutting the items of the group; differs from Edit Cut

Worksheet Hide Items: to hide items and their cells rather than cut them. Does not affect formulas; differs from Edit Cut

Edit Copy: to copy the current selection to the clipboard

Edit Clear Cells: to delete manually entered or calculated cell values

Selecting in Improv: to select what you want to cut

To place the current selection on the clipboard, replacing the clipboard's contents. Can be used to remove or reposition (with Edit Paste)

Keyboard equivalent: Ctrl+X

Rules

Tip **Procedure**

1. Select what you want to cut
   To select one item and its associated cells, one formula, or one cell value, click it
   To select part of an item name or part of a formula, double-click and drag to highlight the characters you want to cut
   To select a range of items and associated cells, multiple formulas, or cell values, click and drag
   To select a worksheet, view, presentation, or script, choose Window Browser to display the Browser. Select the element you want to cut
2. Choose Edit Cut
   Improv removes the selection from the worksheet and places it on the clipboard, replacing the clipboard's contents

See Also

Edit Paste: to place the clipboard contents at a new location

Selecting in Improv: to make the appropriate selection

Cutting text

- Cut deletes only text that is selected. Double-click the text and drag to select the characters you want to cut

Cutting the last item in a category

- Delete the category (Edit Delete Category). A category must contain at least one item

Cutting item names

- You cannot cut an item name alone. When you cut the item, you also cut its cells

Cutting linked items or categories

- Cutting severs the link. It is not re-established after you paste

Cutting calculated values

- You cannot cut cell values that a formula calculates. Improv copies the values instead. (See Clearing cells to overwrite calculated cells)

Cutting all worksheet views

- If you cut all the views of a worksheet, Improv deletes the worksheet from the model

Places a copy of the current selection on the clipboard, replacing its previous contents

Keyboard equivalent: Ctrl+C

Procedure

Rules

Allows you to copy

- items and cells: to copy pieces of a worksheet and reproduce them in another worksheet or model
- text: to speed up entering repetitious text
- cell values: to duplicate data easily or to copy data to another worksheet or model
- formulas: to reproduce a complicated formula so that you can modify the copy
- worksheets: to duplicate a worksheet in another model

See Also

Edit Cut: to remove a selection from one location and place it in a new location; differs from Edit Copy

Edit Paste: to paste the contents of the clipboard

Edit Paste Special: to control how you want the selection to affect the worksheet

To place a copy of the current selection on the clipboard, replacing the clipboard's contents. Can be used to reposition (with Edit Paste)

Keyboard equivalent: Ctrl+C

Tip **Procedure**

1. Select what you want to copy
   To select one item and its associated cells, one formula, or one cell value, click it
   To select part of an item name or part of a formula, double-click and drag to highlight the characters you want to cut
   To select a range of items and associated cells, multiple formulas, or cell values, click and drag
   To select a worksheet, view, presentation, or script, choose Window Browser to display the Browser, then select the element you want to copy
2. Choose Edit Copy
   Improv copies the selection from the worksheet and places the copy on the clipboard, replacing the clipboard's contents

---

See Also

Edit Paste: to place the clipboard contents at a new location

Edit Cut: differs from Edit Copy: useful to remove a selection from one location and place it in a new location

Copying text

- If a piece of text is being edited, Copy reproduces only the selected text, not the object as a whole. Double-click the text and drag to select the characters you want to copy

Copying hidden rows or columns

- Be sure the hidden items are within the range you select

Copying calculating values

- An alert box lets you choose whether to continue, cancel, or wait for the calculation to complete

Copying worksheets

- Choose Window Browser. Select the worksheet you want to copy, and choose Edit Copy

---

See Also

Window Browser: to copy worksheets

Places the contents of the clipboard following the current selection. The pasted selection becomes the current selection

Keyboard equivalent: Ctrl+V

Procedure

Rules

Allows you to paste:

- Items: to reorganize the structure of a worksheet by pasting one or more items and their cells to a new location
- Text: to duplicate text without retyping
- Item Names: to paste only item names in a new location
- Cells: to insert cell values in the same worksheet, in another worksheet, or in a different model
- Formulas: to rearrange the order of formulas or to duplicate formulas in another worksheet or model
- Worksheet: to move a worksheet or its copy to another model

See Also

Edit Cut: to cut a selection to the clipboard, where it can be pasted to a new location

Edit Copy: to copy a selection to the clipboard for pasting elsewhere

Edit Paste Special: to specify how a selection is pasted

To place the contents of the clipboard in a new location following the current selection

Rules

Tip **Procedure**

1. Cut or copy a selection
2. Select the location where you want to paste
3. Choose Edit Paste or click the SmartIcons paste icon

See Also

Edit Paste Special: to specify how a selection is pasted
Edit Cut: to cut a selection to the clipboard, where it can be pasted to a new location
Edit Copy: to copy a selection to the clipboard for pasting elsewhere

Pasting text or values

- You can paste into a calculated cell. The calculated value remains underneath. To restore the calculated value, choose Edit Clear

Pasting a copy of an item

- When you paste a copy of an item, Improv adds a sequential number to the item name to conform to naming conventions

Pasting a number of values into a smaller number of cells

- If the clipboard contents do not fit in the selected position, Improv warns you that the selection will be clipped

Pasting a formula in the same worksheet

- If you copy and paste a formula in the same worksheet, the pasted formula is not checked

Pasting a copy of a worksheet

- If you paste a copy of a worksheet in the same model, Improv adds a sequential number to the name

See Also

Edit Cut: to remove information from one location prior to pasting it in another location

Edit Clear Cells: to restore a calculated value in a cell

Edit Copy: to copy the current selection to the clipboard

Edit Paste Special: to specify how you want the clipboard contents pasted

Specifies how you want the clipboard contents pasted into the selected location

Using Paste Special in a worksheet: to specify whether new values replace the old, are added to or subtracted from existing cells, or apply only to empty cells. Use Paste Special, Link to share data between models and applications (DDE)

Using Paste Special in a presentation: to specify how information is pasted between applications. Use Paste Special, Link to link or embed objects in presentations (OLE)

Allows you to

- control the effect that new cell values have on the existing cell values
- decide whether you want the pasted selection to use the original styles or take on the styles of the new location
- control how information is pasted from one application into Improv

---

See Also

Edit Paste: to paste a selection without regard to existing values; differs from Edit Paste Special

Displays the Paste Special dialog box to specify how you want the clipboard contents to be copied into the selected cell location. Selections can be made from within Improv or from another model or application

---

Tip **Procedure**

1. Select what you want to paste, then choose Edit Cut or Edit Copy to move it to the clipboard
2. Select the area in the data pane where you want to paste the selection
3. Choose Edit Paste Special
   Improv displays the Paste Special dialog box. Choose from the following options:

   Paste
   Values: check the box to paste values in the target cells
   Styles: check the box to paste styles in the target cells

   Paste Values
   Replace existing values: the values on the clipboard are pasted into the target cells. Paste Link is available for this option. The source file must be saved to enable Paste Link
   Add to existing values: adds the values on the clipboard to the values in the cells, instead of replacing them
   Subtract from existing values: subtracts the values on the clipboard from the values in the cells, instead of replacing them
   Paste only into empty cells: if the cells are empty, the values on the clipboard are pasted into the cells. If there are values in the cells, they are not overwritten

   Transpose Rows and Columns
   Transposes the rows and columns before pasting, so that each column is pasted into a row and each row into a column
4. Choose Paste, Paste Link, or Cancel
   Paste: Pastes the selection from the clipboard as specified
   Paste Link: Pastes the selection from the clipboard and maintains a link. When you update the source file, the selection will also be updated in the target cells

---

See Also

Edit Copy: to copy a selection

Edit Paste: to paste a selection without maintaining a link or providing special options

Edit Cut: to cut a selection and move it to the clipboard

Displays the Paste Special dialog box to specify how you want the clipboard contents to be pasted into the presentation

Tip **Procedure**

1. Select what you want to paste, then choose Edit Cut or Edit Copy to move the selection to the clipboard
2. Select the presentation where you want to paste the selection
3. Choose Edit Paste Special
   Improv displays the Paste Special dialog box. The origin application appears in the Source field
4. Choose a data type from the Data Type list to specify the format for the data to be pasted
5. Choose Paste, Paste Link, or Cancel
   Paste: Pastes the selection from the clipboard as specified
   Paste Link: Pastes the selection from the clipboard and maintains a link. When you update the source file, the selection will also be updated in the presentation
   The pasted object can be moved and resized

See Also

Edit Copy: to copy a selection

Edit Paste: to paste a selection without maintaining links or offering special treatment

Edit Cut: to cut a selection from one location to the clipboard

Adds an item, category, or formula to the current worksheet, depending on the selection

Allows you to

- build the structure of a worksheet by adding items and categories as needed
- add formula lines in the formula pane for creating formulas or entering comments

Tip **Procedure**

1. Click to select an item, category, or formula
2. Choose Edit Add

See Also

Edit Add Item: to add an item to the current worksheet
Edit Add Category: to expand the scope of a worksheet by adding a category
Edit Add Formula: to add a new formula line
File New: to create a new file for an Improv model
Create Worksheet: to add a new worksheet to the current model
Create View: to create a new view of the current worksheet in a model

Adds an item to the current worksheet

Mouse alternative: click and drag within the worksheet grid to add one or more items to the worksheet

Keyboard shortcut: select an item and press Enter

Procedure

Allows you to

- build the structure of a worksheet by adding items as you need them
- add one or more automatically named items in a sequence of items, such as months, years, catalog numbers, or checkbook entries

---

See Also

Editing your work: to see a list of all edit operations

Create Item Group: to create a group of items

Edit Delete Item: to delete an item

Create Items: to create a specified number of new items

To add an item to a worksheet

Tip **Procedure**

1. Click an item name to select it
   The selected item acts as a marker; the new item will appear beside the selected item
2. Choose Edit Add Item or press Enter
   Improv adds a new item with a default name to the worksheet. You can edit the default name

	January	February
Item A1		

If the new item is the next in a series that Improv recognizes, the new item is automatically named (February)

	January	February
kiwi		
mango		
Item A3		

If the new item is not part of a series, the new item has a default name (Item A3), which you can click to edit

See Also

Create Items: to create multiple items in a series

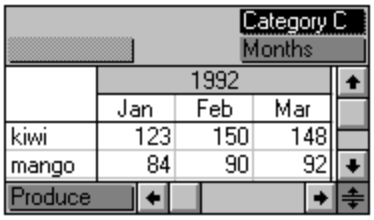
Adds a category to the current worksheet

Keyboard shortcut: select a category tile and press Enter

Procedure

Allows you to

- build the structure of a worksheet by adding a category as needed



Adding a new category for Years (Category C) means that you can use the same worksheet for next year's sales figures, and even project into the future

- add a category to represent a new collection of items

See Also

Create Category: to create a new category

To add a category to an existing worksheet

Tip **Procedure**

1. Click a category tile to select the category
   The selected category acts as a marker; the new category tile will appear in the same row, column, or page area (up to four category tiles in each area)
2. Choose Edit Add Category (or press Enter)
   Improv adds a new category tile with a default name and displays the first item in the category
3. Type a new name for the category
   To change the name, click the category tile and begin typing

   To edit the name, double-click the category tile, move the cursor to where you want to make the change, and delete or add characters

See Also

Edit Add Item: to add one or more items to an existing category

Edit Delete Category: to delete a category and its associated items

Create Category: to create a new category in an existing worksheet

Adds a blank formula line to the formula pane of the current worksheet

Procedure

Allows you to

- insert additional formulas in the formula pane
- add a formula line to use as space for a note. Use two slashes (//) at the beginning of the formula line to indicate the content is a comment

See Also

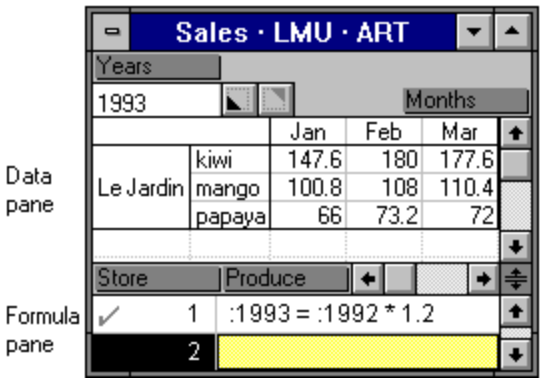
Create Formula: to add a new formula line. If the cursor is in the data pane, the selection is also included as the initial part of the new formula

Formula Basics: to learn about writing and using Improv formulas

To add a blank formula line to the formula pane of the current worksheet

Tip **Procedure**

1. Click to select a numbered formula line in the formula pane
   The new formula will be added below the selected formula
2. Choose Edit Add Formula



Improv adds a new, numbered formula line to the formula pane

See Also

Edit Delete Formula: to delete a formula and clear the values in the calculated cells

Formula Basics: to create and use the formula you need

Create Formula: to add a new formula line. If the cursor is in the data pane, the selection is also included as the initial part of the new formula

Controls the display of values in selected cells. You can delete manually entered and calculated values from the selected cells, or clear only manually entered data. You can also specify whether styles apply to the cell selection

Keyboard equivalent: Delete key

Procedure

Allows you to

- overwrite calculated cells without destroying the underlying formulas
- cancel in one step a combination of style settings, such as color or font, from selected cells

See Also

Worksheet Style: to specify the style for cells, such as font, line styles, colors, and fill patterns

Edit Paste Special: to specify how you want to paste the selection

To clear a cell of manually entered data, or both manually entered data and calculated values, or styles

Tip **Procedure**

1. Select the cell or cells that you want to clear
2. Choose Edit Clear Cells
   Improv displays the Clear dialog box
3. Choose how you want to clear the cell
   Data & calculated values: manually entered values will be cleared. Calculated values will be overlapped with blank cells
   Data only: only manually entered values will be cleared. Calculated values previously overlapped by entered values will reappear
   Styles only: only style settings will be cleared; cell values are not changed
4. Click OK to clear the cells as specified

See Also

Worksheet Style: to specify the style for cells, such as font, line styles, colors, and fill patterns

Permanently removes items and their associated cells from a worksheet

To restore deleted items, choose Edit Undo (works only if you have not yet completed another operation)

Procedure

Rules

Allows you to

- correct the structure of the worksheet easily while you are building it
- remove outdated information

See Also

Selecting in Improv: to pinpoint which items and their cell values you want to delete

Edit Undo: to replace a deleted item and its cells

Worksheet Hide Items: differs from Edit Delete: useful to remove the information from the display without affecting formulas or the worksheet structure

Edit Add Item: to add items and cells to the worksheet

Permanently removes the selected category from the worksheet

To restore a deleted category, choose Edit Undo (works only if you have not yet completed another operation)

Rules

Allows you to

- correct the structure of the worksheet easily while you are building it

Tip **Procedure**

1. Delete all but one of the items in the category you want to delete
   To delete the items, either select and delete individual items, or click and drag to select multiple items. Choose Edit Delete
2. Choose Edit Delete Category to delete the last item and the category tile from the worksheet
   Improv displays an alert box if there is more than one item remaining in the category or if deleting will break a formula

See Also

Selecting in Improv: to pinpoint which category you want to delete

Create Category: to add a category to a worksheet

Edit Undo: to replace a deleted category

Permanently removes the selected formulas and their calculated values from a worksheet. To restore a deleted formula, choose Edit Undo

Keyboard shortcut: select one or more formulas and press the Delete key

Procedure

Rules

Allows you to

- delete old or outdated formulas and the values they calculate

See Also

Selecting in Improv: to pinpoint which formula or formulas you want to delete
Edit Add Formula: to add a blank formula to a worksheet
Edit Undo: to reverse the effect of deleting a formula
Create Formula: to create a new formula

Tip **Procedure**

Deletes the view or views selected in the Browser (Window Browser). The deleted views are not copied to the clipboard, but can be retrieved using Edit Undo

Keyboard shortcut: select a worksheet view in the Browser and press the Delete key

Procedure

Rules

Allows you to

- experiment with different arrangements of the data in a worksheet by creating multiple views then deleting the extraneous views

---

See Also

Worksheet Hide Items: to remove the information from the display without affecting formulas or the worksheet structure; differs from Edit Delete

Worksheet Settings: View: to specify whether style changes made to one view apply to all views

Edit Undo: to restore the deleted view

Procedure

You can delete from the worksheet: items and their cells, one or more formulas, or a category

(Note: to delete cell values only, choose Edit Clear)

Using the Browser you can delete one or more worksheets, views, presentations, and scripts

Rules

Procedure

1. Select what you want to delete
   Item or items: click one item name, or click and drag adjacent items
   Formula or formulas: click one formula, or click and drag to select adjacent formulas
   Category: click the category tile. All items in the category but one must already be deleted
   Views, presentations, and scripts: choose Window Browser and click one of the elements, or click and drag to select adjacent elements from the list
2. Choose Edit Delete
   Improv displays an alert box if you are about to delete data or break formulas or DDE links

If you deleted something and want to retrieve it, choose Edit Undo to undo the delete (if Enable Edit Undo is checked in Tools User Setup)

See Also

Edit Cut: differs from Edit Delete: to cut a selection to the clipboard, where it can be retrieved
Edit Clear Cell(s): to clear manually entered or calculated values from cells
Edit Undo: to remove the effect of the latest action
Window Browser: to delete a worksheet, view, presentation, or script from a model

Deleting calculated items

- Deleting all items referenced in a formula breaks the formula

Deleting the last item in a category

- Choose Edit Delete Category to remove the category; you cannot delete the last item in a category

Deleting the group name only

- Choose Worksheet Ungroup Items to delete the group name and ungroup the items. Select the group name and choose Edit Delete Items to delete the group name and all its items

Deleting the last item in a group

- If a group contains only one item, deleting the item deletes the entire group

Deleting calculated values

- Delete the formula that calculates the cells. To change a calculated value without deleting the formula, select the cell and type in a new value. Improv warns you that you are overwriting the value

Deleting manually entered cell values

- If you are deleting an item with manually entered cell values, Improv warns you that you will destroy data

---

See Also

Edit Cut: to cut a selection from a worksheet to the clipboard

Edit Clear Cells: to clear overwritten data values in cells

Edit Undo: to undo the most recent deletion

Creates a selection that can encompass all members of the current selection. You can then restrict the selection to only item names or cells

Mouse alternative: click the select-all box (example)

Keyboard shortcut: select an item, cell, or formula and press Ctrl+A

Procedure

Allows you to

- select all the objects of the same type in the current view, including hidden items or collapsed groups
- quickly select objects in the worksheet to which you want to apply a global change

See Also

Edit Select Item Names: to modify the current selection to include only the item names

Edit Select Cells Only: to modify the current selection to include only the cells

To create a selection that encompasses all the members of the current selection. You can then restrict the selection to only item names or cells

To select everything in the data pane, click the select-all box

Tip **Procedure**

1. Make a selection
   To select all the items and cells, select an item
   To select all the cells, select a cell
   To select all the formulas in the formula pane, select a formula
2. Choose Edit Select All
   Improv highlights all the selected members

See Also

Edit Select Item Names: to modify the current selection to include only the item names
Edit Select Cells Only: to modify the current selection to include only the cells

Selects only the names of the items without affecting the cells

Mouse alternative: Ctrl-click on an item name

Procedure

Allows you to

- customize the look of a worksheet, formatting the item names in one style and the cell values in another

	Jan	Feb	Mar
kiwi	123	150	148
mango	84	90	92
papaya	55	61	60

Item name selected. Choose Worksheet Style to display the Style panel and change the styles for the item name

See Also

Edit Select Cells Only: to specify only the cells in a selection

Edit Select All: to select all the items, or all the cells

To select only the names of the items

Tip **Procedure**

1. Select the items you want to refine to an item names selection
2. Choose Edit Select Item Names

	Jan	Feb	Mar
kiwi	123	150	148
mango	84	90	92
papaya	55	61	60

The item name Le Jardin is selected. Style changes will apply only to the item name, rather than to the item name and its cells

See Also

Edit Select Cells Only: to select only the cells in a selection

Selects only the cells in a selection without affecting the item names

Mouse alternative: Ctrl-click

Allows you to

- customize the look of a worksheet, formatting the cell values in one style, and the item names in another

	Jan	Feb	Mar
kiwi	123	150	148
mango	84	90	92
papaya	55	61	60

Cells selected. Choose Worksheet Style to display the Style panel. As you choose different style options, the changes appear in the cell selection

Tip **Procedure**

1. Select the items you want to refine to a cell selection
2. Choose Edit Select Cells Only

See Also

Edit Select All: to select the item names, or the cells

Edit Select Item Names: to select only the item names in the current selection

Commands	Action
Worksheet Formula Category Item group Items... View	Adds a new worksheet to the current model. Adds a new formula, category, item group, or items to an existing worksheet. Creates a new view of an existing worksheet
Presentation Chart Hotview Draw Object	Creates presentation and graphic elements, including OLE objects
Script	Controls the creation and execution of scripts in Improv

Creates a new worksheet in the current model. The data pane contains one cell formed by the intersection of two items, one in each category. The formula pane contains a blank, numbered formula (example)

Procedure

Allows you to

- create models with multiple worksheets that can be linked through intersheet formulas
- build a model with a variety of worksheets that handle different kinds of information. For example, your model may use one main worksheet, which depends on tax rates from a second worksheet and on variable price data from a third worksheet

See Also

Create View: to compare different arrangements of the same worksheet data in different windows; differs from Create Worksheet

File New: to create a new model that you can save in a new file. Each file can contain multiple worksheets, each of which has one or more views; differs from Create Worksheet

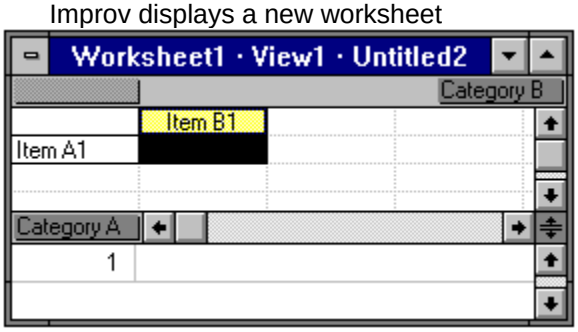
Edit Delete View: to delete a view of a worksheet. If you delete all the views of a worksheet, the entire worksheet is deleted

Window Browser: to rename, copy, or delete the worksheet

To expand the scope of a model by adding a worksheet that contains different information

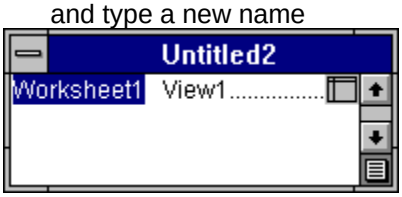
Tip **Procedure**

1. Open the file containing the model in which you want to add a worksheet
2. Choose Create Worksheet
   Improv displays a new worksheet

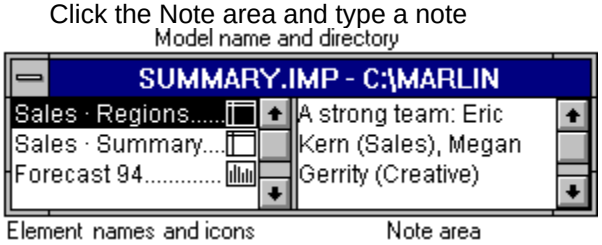


   The worksheet appears with two categories that have the default names Category A and Category B. Each category has an item, which are named Item A1 and Item B1

3. Rename the worksheet
   Open the Browser (Window Browser), double-click the worksheet name (such as "Worksheet1"), and type a new name



4. To annotate a view of the worksheet by adding a note
   Click a view name in the Browser
   Click the bottom right corner to open the Note area
   Click the Note area and type a note



See Also

Edit Add: to add items, categories, and formulas to a new or existing worksheet
Window Browser: to name, annotate, and manipulate the worksheets in a model
Create View: to create a new view of the current worksheet

Adds a new formula line to the formula pane. If the selection is an item, cell, group, or category, Improv enters the current selection into the formula. If the cursor is in the formula pane, Improv adds a blank formula line

Keyboard alternative: In the formula pane, press Enter to add a blank formula line. In the data pane, press the equal sign (=) to enter the current selection into the formula

Procedure

Allows you to

- create a formula directly from the data pane
- create additional formulas in the formula pane

See Also

Formula Basics: to learn about formula concepts and how to create and edit formulas

Adds a new formula line to formula pane, or, if the cursor is in the data pane, enters the first part of the formula

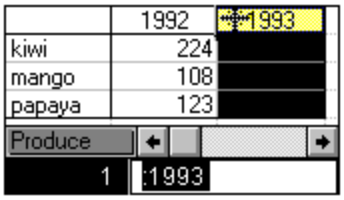
Tip **Procedure**

Creating a new formula line in the formula pane

- Click an existing formula and press Enter, or
- Choose Create Formula, or
- Click the Formula icon from the SmartIcons set

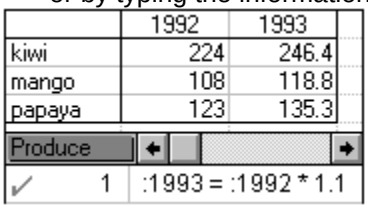
Creating a formula using Create Formula

1. Select the items or cells for which you want to calculate values
2. Choose Create Formula
   Improv displays a formula line and creates the left side of the formula based on the data pane selection. The cursor changes to a crosshair



The left side of the formula describes where you want the answer to appear

3. Enter the right side of the formula by clicking item names, cells, and symbols on the formula bar, or by typing the information (see Formula Punctuation if you type a formula)



4. Press Enter or click to the left of the formula number to check the formula

Creating a formula note

1. Double-click an empty formula line in the formula pane
2. Type two slashes (//) and the text of the formula note
3. Press Enter

See Also

Formula Basics: to learn more about how to use Improv formulas

Formula punctuation: to learn syntax rules, if you want to type formulas

Status indicators: to identify a formula's status

Selecting in Improv: to make the appropriate selection for creating formulas

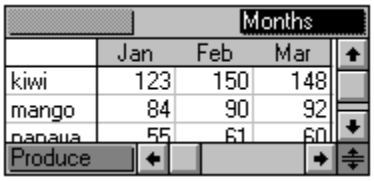
Adds a category to the current worksheet

Mouse alternative: select a category tile and press Enter

Procedure

Allows you to

- build the structure of the worksheet by adding a category as needed



Here, two categories (Produce, Months) help you keep track of monthly produce sales

Tip **Procedure**

Adding another category allows you to expand the model in one step. Here, Category C will be renamed to Years to track sales year by year

- add a category to represent a new collection of items

See Also

Edit Add Item: to add an item to an existing category

Create Items: to add multiple items to an existing category

Edit Delete Category: to delete a category and its associated items

Edit Add Category: to add a category

Adds a new category to an existing worksheet. A worksheet can contain a maximum of twelve categories (four categories in the row, column, and page area)

Tip **Procedure**

1. Click an existing category tile in the area where you want to add a new category
2. Choose Create Category

   Improv adds a new category in the same area. If the area already contains four categories, Improv will add the category in one of the other areas. The category tile has a default name consisting of the word Category and a letter
3. Rename the category

   The category is selected; just type the new name and press Enter

See Also

Rearrange Categories: to move the category tiles and their items to a new location for a different look at your data

Edit Delete Category: to delete a category

Edit Add Category: to add a category to one of the category areas

Collects selected items within the same category into a group identified by a common group name. The group can be referenced by the group name in a formula. A group can have a single summary item

Procedure

Allows you to

- collect similar items under a general group name. For example, items "kiwi," "apple," and "pear" can be collected under the group name "fruit"
- automatically include additional items in the group summary calculation. For example, if "Shirts" is the group name, with "silk," "linen," and "cotton" as items, you can add "rayon" later and the group summary formula adjusts automatically to include the new item (example)

See Also

Worksheet Ungroup Items: to disband the group without changing the data

Worksheet Add Group Summary: to create a summary item for a group

Tools User Setup: Font, Summary, Overlap, Units: to automatically add a summary item to a group when the group is created

Worksheet Collapse Group: to display only the group name and summary item

Deciding between groups and categories: for more on how to structure information in groups or categories

Collects selected contiguous items into a group identified by a common group name. All items must be within the same category

Tip **Procedure**

1. Select contiguous items for the group
2. Choose Create Item Group. The selected items are grouped under a default group name, which you can edit

	Jan
kiwi	123
mango	84
papaya	55

		Jan
Group A4	kiwi	123
	mango	84
	papaya	55

The selected items become items in Group A5, which you can rename "Fruits"

Getting the right group name

If you have an existing item that you want to become the item group name, you must rename the item to be a member of the group, and then reenter the item group name to the left

See Also

Worksheet Ungroup Items: to eliminate the group name and change the group items to individual items

Adds items to a category or a group in an existing worksheet. The maximum number of items in a category is 16,000. An alert is displayed when you reach the maximum

Procedure

Allows you to

- add multiple items to a category at one time
- add an automatically named series, such as part numbers or incremental dates

See Also

Edit Add Item: to add a single item to a worksheet

To add new items to your worksheet

Tip **Procedure**

Adding items using the menu

1. Select an item. New items will be added after the selected item
2. Choose Create Items or Edit Add Item

   If the selected item is in a group, the new item is added to the group

Adding items using the Enter key

1. Select one or more items. New items will be added after the selection
2. Press the Enter key once for each item
   To add items before a target item, press Shift-Enter

Adding items by dragging the grid

1. Move the cursor to the light gray grid lines outside the worksheet border
2. Click and drag the mouse
   The cursor changes shape. As you drag out along the grid, the gray grid lines change to solid black grid lines and the new items appear in the expanded rows and columns. Improv assigns default names to the new items
3. Release the mouse button to add the items

Adding an automatically named series of items

1. Name an existing item from a series that Improv recognizes. For example, name an item January to initiate a named series of months

   Improv recognizes series names such as months, years, weekdays, and alpha and numeric sequences
2. Add items following the named item by any of the above methods

See Also

Creating an item group: to create a group
Edit Delete Items: to delete unnecessary items

Creates a new window with a new view, which is a duplicate of the current view of the worksheet

If you want to set different styles in each view, make sure "Apply styles to all views" is not checked in the View page (Worksheet Settings)

Procedure

Rules for Using Views

Allows you to

- change the appearance of a worksheet in one view by rearranging categories. The data in the worksheet remains unchanged
- display a separate set of data from the full worksheet in a new view (Worksheet Hide Items). You then have two windows, each with a different view of the same worksheet
- experiment with a view of the worksheet, for example, by applying different fonts and styles to highlight information

---

See Also

Create Worksheet: differs from Create View: useful to create a new worksheet with different items, categories, and data

Worksheet Settings: View: to display the Settings page that controls View options

Edit Delete View: to remove a view from a model

Window Browser: to rename a view or delete a view from the model

Worksheet Hide Items: to hide items and their cells in a view

Worksheet Collapse Group: to collapse a group in a view to show only the group name and the summary item

Rearranging Categories: to change the display of a view by moving categories

To create a copy of the current view of the worksheet, including formulas and hidden items

Rules

Tip **Procedure**

1. Select the worksheet view you want to copy

   If there are multiple views of the worksheet, click to select the view that you want to duplicate
2. Choose Create View to display a new view

   The view window title bar displays the view's default name, which includes the current worksheet name, a sequential view number, and the current file name
3. Use any of the following commands and operations in a view:

   Modify styles: Use the Style panel to change text, lines, and background

   If you want style changes to appear in all views, check "Apply styles to all views" in the View settings page (Worksheet Settings). Leave the box unchecked if you do not want the styles to apply to all views

   The following changes affect only the current view:

   Hide items (Worksheet Hide Items)

   Collapse groups (Worksheet Collapse Group)

   Rearrange categories (example)

See Also

Window Browser: to rename the view using the Browser

Worksheet Settings: to display the settings page

Worksheet Show Items: to show items in a view

Rearranging Categories: to rearrange categories in a view to look at the data in a different way

Rules that apply to all views of a worksheet

- Any changes in data are updated in all views of the worksheet
- Editing, creating, deleting, cutting, or pasting an item, category, formula, or cell value in one view of the worksheet affects all the views of the worksheet

Rules that apply to individual views of a worksheet

- Hiding and collapsing a selection, and rearranging categories apply only to the current view
- Style changes apply only to the current view if "Apply styles to all views" is not checked in the View page (Worksheet Settings). If the option is checked, changes apply to all views
- Each view has a unique name. By default, the first view is named View1. This name appears in the title bar with the worksheet name and the file name (as in Worksheet1.View1). As new windows are created, the view number increases by one, as in View2, View3
- To name a view, edit the name in the Browser (Window Browser)

See Also

Window Browser: to name a view window

Creating a new view: to create a new view

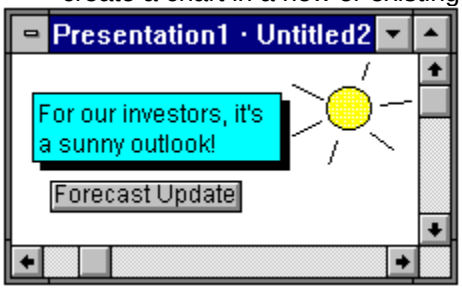
Worksheet Settings: View: to control the display of markers, grids, items, and styles in the current view of a worksheet

Creates a new, blank presentation window

Procedure

Allows you to

- assemble a complete presentation in a single window. Improv provides text blocks and graphic objects to annotate and enhance the presentation. You can also add a chart to a presentation
- add a hotview to the selected presentation. The hotview is a linked portion of a worksheet, which is saved as part of the presentation
- create a chart in a new or existing presentation. A chart is saved as part of the presentation



A presentation can contain charts, graphic objects, text blocks, and buttons, which can be linked to a script

See Also

Create Chart: to add a chart to a presentation

Create Hotview: to add a linked portion of a worksheet to a presentation

Create Draw: to add a line, rectangle, oval, text block, or button to a presentation

Create Object: to create and embed new objects in a presentation

Presentation Style: to display the Style panel, which can be used to change color, pattern, text, and line style for any of the presentation graphic objects

Window Browser: to name the presentation window

In Improv, a presentation can include multiple objects from various sources

You can:

- place a chart in a new or existing presentation
- link worksheet data to data in a presentation (Hotview)
- add text or drawings to a presentation
- embed an object from another application

Tip **Procedure**

To create a presentation with a chart

1. Select the data you want to chart
2. Choose Create Chart

To create a presentation

- Choose Create Presentation
  Improv creates a new presentation window. You can add charts, rectangles, ovals, text, and buttons (connected to scripts)

See Also

Create Chart: to create a chart in a new or existing presentation window

Create Hotview: to link data in your worksheet to a presentation

Create Draw: to draw ovals, rectangles, text blocks, and buttons in a presentation

Create Object: to embed pictures or objects from other applications in a presenation

Chart Help: a separate Help file that describes the Chart commands. Choose Chart Help from the Help menu

Creates a chart in a new or existing presentation. Any changes in the worksheet data are automatically reflected in the chart

Procedure

Allows you to

- modify a presentation by adding a new chart. The chart is saved as part of the presentation
- create a new presentation window and a chart in one step

See Also

Create Presentation: to create a new presentation

Chart Help: to learn how to customize a chart. Chart help appears in a separate Help file, which you can open from the Help menu or by pressing F1 while you are working on a chart

To create a chart in a new or existing presentation

Tip **Procedure**

To create a chart in a new presentation

1. Select the data you want to chart

   To plot a discontiguous range of data, hide items you do not want to plot (Worksheet Hide Items), then click and drag to select items to chart

2. Choose Create Chart
   Improv creates a new presentation window and displays a default bar chart of the selected data

To create a chart in an existing presentation

1. Select the data in the worksheet that you want to chart
2. Choose Create Chart
3. Choose the existing presentation in which you want to place the chart

   The dialog box lists New Presentation and the currently open presentations in the model

4. Click OK to create a new chart in the selected presentation

   If you choose New Presentation, Improv creates a new presentation window and adds the new chart

If you choose an existing presentation, Improv creates a chart in the existing presentation on top of any other objects or charts in the window. You can move the objects and resize the presentation window to accommodate all the objects

See Also

Create Presentation: to create a new presentation

Chart Help: to learn how to customize a chart. Chart help appears in a separate Help file, which you can open from the Help menu or by pressing F1 while you are working on a chart

Creates a hotview in a new or existing presentation. A hotview is a data pane selection displayed in a presentation. Changes in the worksheet data are automatically updated in the hotview

Procedure

Allows you to

- create a dynamic presentation that displays up to the minute information
- combine multiple hotviews into one presentation comparing performance or making forecasts
- focus attention on selected worksheet data without having to display the entire worksheet
- present worksheet data more effectively. Annotations, charts, and objects can help highlight important information
- maintain data in a single place while changes are automatically reflected in the linked presentation

See Also

Create Chart: to create a new chart in a new or existing presentation

Create Presentation: to create a new presentation

Create Draw: to annotate and enhance a presentation

Create Object: to create and embed new objects in a presentation

To create a hotview in a presentation that is linked to a worksheet

Tip **Procedure**

1. Select the items and cells that you want to include in the hotview
2. Choose Create Hotview
   Improv displays the Create Hotview dialog box if there is an existing presentation in the current model

   If there is no existing presentation in the current model, Improv automatically creates a presentation and places the hotview inside it
3. If Improv displays the Create Hotview dialog box, click:

   New Presentation: to create a new presentation window for the hotview

   one of the presentations from the list: to add the hotview to an existing presentation
4. Click OK to add the hotview to the selected presentation

See Also

Selecting in Improv: to select exactly what you want to include in a hotview

Working with a hotview: to move, resize, and update a hotview

Creates a line, rectangle, oval, text block, or button object in a presentation. These objects can be resized and moved in the presentation window

Procedure

Allows you to

- draw attention to some part of a presentation
- enclose information within a rectangle or an oval
- annotate a presentation using the text block
- create a button to which you can attach a script

Forecast

	1992	1993	1994
kiwi	1000		
mango	2000		
TOTAL	3000	0	0

The button "Forecast" is attached to a script that predicts 1993 sales in the crucial kiwi and apple markets based on different factors

See Also

Create Hotview: to create a hotview of a worksheet in a presentation

Create Chart: to create a chart in a presentation

Create Object: to create and embed new objects in a presentation

Modifying objects in a presentation: to resize, reposition, or change the attributes of drawn objects

Embed an object from other another application in a presentation. You can access available OLE applications directly from Improv to create an object for a presentation. Embedded objects can be moved, resized, deleted, cut, copied, and pasted

Procedure

Allows you to

- include information from other applications in your Improv presentation
- enhance a presentation by adding Paintbrush art or sound

See Also

Create Draw: to add lines, rectangles, ovals, text boxes, and buttons to a presentation

Create Presentation: to create a new presentation

The Create Object dialog box lists all applications installed on your machine that support OLE. Embedding data is useful when you want to control access to the data or to keep all the data in a single Improv file. When you use the Create Object command, you create an embedded object

Tip **Procedure**

1. Make active the presentation in which you want to embed an object
2. Choose Create Object to display the Create Object dialog box
3. Select the desired application from the Object Type list, then click OK

   A rectangle appears in the presentation as a placeholder for the new object. The selected server application is launched
4. Create an object
5. Choose File Update or follow the server's instructions to update the embedded object

See Also

Working with OLE objects in a presentation: to edit linked or embedded objects in a presentation

Linking or embedding objects in a presentation (OLE): to link or embed OLE objects

Drawing objects in a presentation: to draw ovals, rectangles, text blocks, and buttons in a presentation

Adding a picture to a presentation: to paste a picture or bitmap in a presentation; differs from creating an OLE object

Creates a script either by recording keystrokes using the recorder or by entering commands in a script window

Procedure

Allows you to

- prepare scripts for frequently used or complicated routines
- write customized scripts using LotusScript

See Also

Tools Run Script: to run a script

Tools Attach Script: to attach a script to a button in a presentation

Create Draw: to create a button in a presentation window, which can then be attached to a script

Tools SmartIcons Edit Icons: to attach a script to one of the custom SmartIcons

Script Record into Script: to add to a script

To create a script

Tip **Procedure**

1. Choose Create Script to display the Create Script dialog box
2. Click a Create Script option

   Start recording:
   - perform the sequence of keystrokes you want to record
   - click the Stop Recording button on the status bar, or choose Create Stop Recording

   Create new script window: to write your own script. See the *Improv Handbook* (chapter 17), or the separate online Help file (choose Script Help from the main Improv menu, or press F1 when a script window is open)

See Also

Tools Run Script: to run a script

Tools Attach Script: to attach a script to a menu item, to a key or a selected graphic, or to run the script when the model opens

Tools SmartIcons Edit Icons: to attach a script to one of the custom SmartIcons

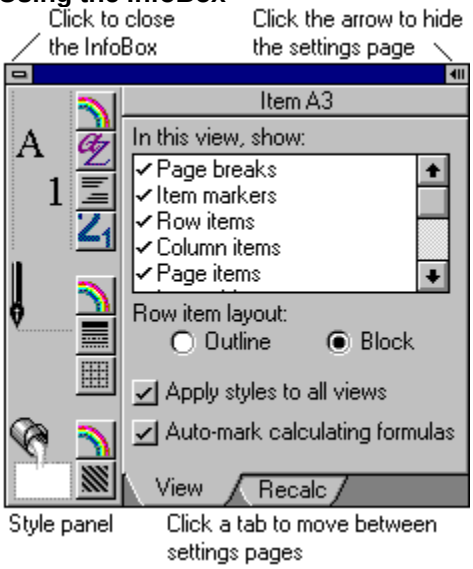
Commands	Action
Settings Style	Displays the settings pages and Style panel
Mark Cells/Mark Formulas	Highlights cells affected by a formula. Highlights formulas that calculate selected cells
Add Group Summary Collapse Group Expand Group Ungroup Items	Creates formulas for and manipulates the display of groups. Changes a group back into individual items
Data Fill Sort Items...	Fills selected cells or item names. Sorts items as specified
Hide Items Show Items Show All	Controls display of selected items and cells in a view
[Add,Clear] Page Break	Adds or clears a page break

Displays the InfoBox, which contains the Style panel and settings pages (View, Recalc, Options, and Chart). The settings change according to what is selected

Allows you to

- set colors, fonts, line styles, fill patterns, alignment, and numeric formats (Style panel)
- customize your worksheet layout (View)
- specify how formulas recalculate (Recalc)
- control the display of errors, overlaps, and markers in the formula pane (Options)

Using the InfoBox



- You can leave the InfoBox open while you are working in Improv
- The settings reflect the current selection
- To close the settings pages, click the arrow at the top, leaving the Style panel on display. If only the Style panel is on display, click the arrow to display the settings pages

See Also

Resizing rows, columns, and more: to control the proportions of a worksheet

To control the display of markers, grids, items, and styles in the current view of a worksheet. Improv displays the View page when an item, cell, or category is selected

Tip **Procedure**

1. Select an item, cell, or category
2. Choose Worksheet Settings
   Improv displays the View page and the Style panel of the InfoBox. The settings appear on the right as pages with tabs; the Style panel appears on the left
3. If View is not displayed, click the View tab (example)
4. Check the setting that you want to apply. Uncheck the setting that you do not want
   Page breaks (example) to display a dotted line at the horizontal or vertical page break
   To add a page break manually, see Worksheet Add/Clear Page Break
   To set a page size, see File Page Setup
   Item markers (example) to mark the location of hidden items or collapsed groups
   If unchecked, there is no indication of hidden items or collapsed groups
   Row items, Column items, Page items (example) to display the item names in the rows, columns, or pages
   Item grid, Cell grid to control the display of the grid lines in the cell area or item area
   Worksheet grid (example) to add items by dragging within the grid
   Category tiles to display the category tiles
5. Click a button to change the following settings
   Row item layout (example)
   Click Outline to display items indented. Click Block to display the items in blocks
   Apply styles to all views to apply all font, format, and row and column sizes to all views. The default is checked. Uncheck this option if you want different styles for different views
   Auto-mark calculating formulas to automatically highlight the formulas that calculate the selected cell or range of cells

See Also

Create View: to create a new view of a worksheet

Worksheet Settings: Options: to change settings for error and overlap messages, auto-check formulas, and auto-mark calculated cells in the formula pane

Worksheet Settings: Recalc: to change the settings for formula recalculation

Worksheet Style: to display the Style panel

Procedure

To control how formulas are recalculated. The Recalc page is available when an item, cell, or formula is selected

Procedure

1. Click an item, cell, or formula
2. Click the Recalc tab to display the Recalc settings
3. Choose one of the options
   Automatically: recalculates whenever cell values change
   Manually: recalculates when you click the Calc button. If you have a large worksheet with many formulas, you can make modifications to the worksheet first, then recalculate once instead of after every change
4. Enter the number of iterations
   Type in the number of iterations to resolve circular references

See Also

Formula Basics: to learn more about creating and using Improv formulas

Worksheet Settings: Options:to change settings for error and overlap messages, auto-check formulas, and auto-mark calculated cells in the formula pane

Worksheet Settings: View: to control the display of markers, grids, items, and styles in the current view of a worksheet

Worksheet Style: to display the Style panel

Procedure

Displays options for the display of formula errors and overlaps, and the auto-check and auto-mark features. The Options page is available when a formula is selected

Procedure

1. Select a formula
2. Choose Worksheet Settings
3. Click the Options tab to display the Options page
4. Click the button beside Inline formula errors to display the list

   Yes: automatically displays the error messages in the formula pane

☒	1	|March = 100 The name 'March' matches no items.

   No: suppresses the error messages

5. Click the button beside Overlap info to display the list

   Off: suppresses audit information in formulas

✓	1	Feb = Jan * 1.1
✓	2	kiwi = mango * 0.42

   The check marks indicate that the formulas are syntactically correct

   On: displays a list of formulas that the current formula overlaps

✓	1	Feb = Jan * 1.1
✓	2	kiwi = mango * 0.42 Overlaps formula 1

   If a new formula overlaps an earlier formula, Improv displays an overlap message

   Audit: provides detailed information about formula overlaps. Each overlap appears on a separate line

✓	1	Feb = Jan * 1.1 Formula 2 overlaps at Feb:kiwi
✓	2	kiwi = mango * 0.42 Overlaps formula 1 at Feb:kiwi

   Using Audit leaves no doubt as to where the overlap occurs. As shown here, the overlap occurs at cell Feb:mango

6. Choose Auto-check formulas

   Checked: automatically checks the formula after editing

   Unchecked: requires you to manually check a formula by clicking the box to the left of the formula or using Ctrl+K

7. Choose Auto-mark calculated cells

   Checked: automatically highlights the cells calculated by the selected formula or formulas

   Unchecked: does not mark the formulas or cells. Leave Auto-mark unchecked to improve performance

See Also

Formula Basics: to learn how to create and use Improv formulas

Worksheet Settings: Recalc: to control how formulas are recalculated

Worksheet Settings: View: to control the display of markers, grids, items, and styles in the current view of a worksheet

Worksheet Style: to display the Style panel

Tip **Procedure**

Displays the Style panel, which controls

text: color, font, alignment, numeric format
line: color, style
background: fill color, pattern

Procedure

Allows you to

- enhance visual understanding and appeal of a worksheet by using color, font, alignment, and line style
- design the presentation you want, using color, pattern, and line styles for text, chart elements, and background
- make cell information easier to read and understand by choosing appropriate numeric formats

See Also

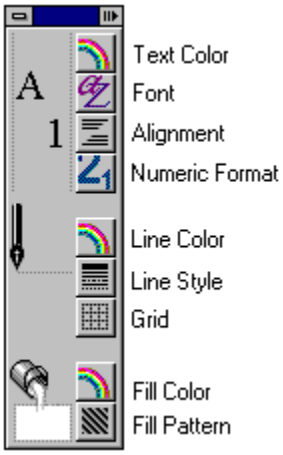
Worksheet Settings: to display and change the settings for the current worksheet

Procedure

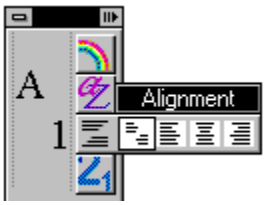
Displays the Style panel, which controls text, line, and fill styles

Procedure

1. Choose Worksheet Style to display the Style panel

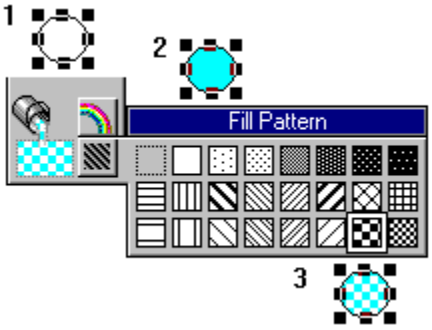


2. Select text, lines, or areas in the worksheet or presentation whose style you want to change
3. Click a button in the Text, Line, or Fill sections to display the popup of options



Click the alignment icon to display a list of options

4. Click a button in the popup. The change is reflected in the selection



Click an object in a presentation (1), choose a fill color (2), then choose a Fill Pattern (3)

See Also

Tools User Setup: Font, Summary, Overlap, Units options: to change the default font

Shows the relationship between formulas and the cells they calculate. Worksheet Mark Cells highlights the cells that the selected formulas calculate. Worksheet Mark Formula highlights the formula or formulas that calculate the selected cells

To set automatic marking, check Auto-mark calculating cells in the View settings and Auto-mark calculated cells in the Options settings (Worksheet Settings)

Keyboard equivalent: Ctrl+M

Procedure

Allows you to

- monitor the effect of cutting or deleting cells or formulas before you do it
- locate cells that are overlapped by another formula or by data
- identify all the cells in a large worksheet that are being calculated by a particular formula

See Also

Formula Basics: to learn more about creating and using Improv formulas
Worksheet Settings: View: to auto-mark calculated cells
Worksheet Settings: Options: to auto-mark calculating formulas

To identify the cells that are calculated by selected formulas (Worksheet Mark Cells) and the formulas that calculate the selected cells (Worksheet Mark Formula)

Tip **Procedure**

- Select a formula and choose Worksheet Mark Cells to see which cells are calculated by the formula

	Jan	Feb	Mar
kiwi	123	147.6	150
mango	84	100.8	120
papaya	55	66	68

Produce

✓ 1	Feb = Jan * 1.2

Improv highlights the cells the formula calculates

	Jan	Feb	Mar
kiwi	123	135.3	150
mango	84	99	120
papaya	55	60.5	68

Produce

✓ 1	Feb = Jan * 1.1
✓ 2	Feb:mango = 99

Improv uses a different shading pattern for cells that are overlapped by another formula or by data. In this example, manually entered data overwrites kiwi:Feb

- Select a cell or cells and choose Worksheet Mark Formulas to see which formulas calculate the values for those cells

✓ 1	Feb:mango = 42
✓ 2	Feb = Jan * 1.1

Formula 2 overlaps Formula 1, indicated by the shading pattern. Formula 2, because it has a higher number, calculates the selected cells

- Select all formulas and choose Worksheet Mark Cells to determine which cells are calculated and which are manually entered
- To highlight formulas and their cells automatically, check Auto-mark calculating formulas in the View settings, and Auto-mark calculated cells in the Options settings (Worksheet Settings)

See Also

Worksheet Settings: View: to auto-mark calculating formulas
Worksheet Settings: Options: to auto-mark calculated cells
Formula Basics: to learn about writing and using Improv formulas
Selecting in Improv: to specify cells or formulas for the command

Adds a summary item at the end of a group and automatically creates a formula to calculate the values for the summary item

Procedure

Allows you to

- readily create one of several statistical types of summary
- show only the summary item for the group (Worksheet Collapse Group) rather than the individual items

See Also

Worksheet Collapse Group: to display only the group name and summary item

Create Item Group: to collect items into a group prior to creating a summary item for the group

Displays the Add Group Summary dialog box that allows you to add a summary item to a group. A group is limited to one summary item

Tip **Procedure**

1. Select the group where you want to add a summary item

		Jan
Fruits	kiwi	100
	mango	200
	papaya	50
	Total	350

2. Choose Worksheet Add Group Summary or choose the Add Group Summary icon. The Add Group Summary dialog box appears
3. Select a summary type and click OK
   The selected summary item appears automatically as a named item at the end of the group. The formula generated for the group also uses the name of the summary type

		Jan	Feb	N
Fruits	kiwi	100	125	
	mango	200	207	
	papaya	50	65	
	Total	350	397	

Produce

✓ 1 Total = groupsum(Fruits)

See Also

Create Item Group: to create a group

Worksheet Collapse Group: to collapse a group with a summary item

Tools User Setup: Font, Summary, Overlap, Units: to automatically create a group summary item when you create a group

Displays only the group name and the summary item. Use Worksheet Add Group Summary to create a summary item

Procedure

Allows you to

- focus on the group summary figures, rather than on both the individual items and the summary
- control the amount of detail visible by presenting collapsed groups in one view and the complete groups in another view

See Also

Worksheet Add Group Summary: to provide a summary item for a group. You must have a summary item before you can collapse a group

Worksheet Expand Group: to redisplay all the items in the group

Tools User Setup: Font, Summary, Overlap, Units: to automatically add a group summary item whenever you create a group

Worksheet Settings: View: to choose whether markers for a collapsed group should be displayed

To collapse a group that contains a summary item (Worksheet Add Group Summary)

Tip **Procedure**

1. Select the group you want to collapse by clicking the group name
2. Choose Worksheet Collapse Group. The items in the group disappear from the display, leaving the group name and summary item. Formulas are unaffected

		Jan
Fruits	kiwi	100
	mango	200
	papaya	50
	Total	350
Vegetables:	Total	1200

Two groups. The group named Vegetables displays a collapsed group marker

3. To display markers for collapsed groups, check Item markers in the View settings (Worksheet Settings)

See Also

Worksheet Add Group Summary: to add a summary item and automatically generate a formula for a group

Worksheet Settings: View: to choose whether markers should be displayed

Worksheet Expand Group: to redisplay all the items in the group

Displays all the items in the selected collapsed group

Procedure

Allows you to

- see all the individual items in a group and evaluate their contribution to the summary item

Vegetables	Total	1200

A collapsed group emphasizes the summary

		Jan
Vegetables	tomato	500
	cucumber	400
	onions	300
	Total	1200

An expanded group shows the whole group in detail as well as the summary item (Total)

See Also

Create Item Group: to create a group

Worksheet Add Group Summary: to collapse a group, you must first use this command to create a summary item for the group

Worksheet Collapse Group: to collapse a group so that it displays only the group name and summary item

Worksheet Settings: View: to choose whether markers for a collapsed group should be displayed

To display all the items in the selected collapsed group

Tip **Procedure**

1. Select the collapsed group that you want to expand

		Jan
Fruits	kiwi	100
	mango	200
	papaya	50
	Total	350
Vegetables	Total	1200

The collapsed group Vegetables is selected

2. Choose Worksheet Expand Group

		Jan
Vegetables	tomato	500
	cucumber	400
	onions	300
	Total	1200

The group Vegetables now displays all the items in the group

If you have multiple views of a worksheet, collapsing a group in one view does not affect the appearance of the group in another view

See Also

Worksheet Collapse Group: to collapse a group so that only the group name and summary item appear

Removes the group name, removes the indentation of the items, and updates formulas

Procedure

Allows you to

- ungroup items without affecting the data or formulas (except indexed and recurrence formulas). Only the group name is removed

		Jan
Fruits	kiwi	100
	mango	200
	papaya	50
	Total	350

The summary item (such as Total) remains a separate item. The formula for the group is still in effect

	Jan
kiwi	100
mango	200
papaya	50
Total	350

- test the effect of grouping items as you build a model, knowing you can easily ungroup items

See Also

Create Item Group: to group items under one common name for ease of use in formulas
Edit Delete Item: differs from Ungroup Items: useful to delete a group and all its items and data
Worksheet Collapse Group: to display only the group name and summary for the group
Worksheet Hide Items: to hide selected group items or the entire group

Disbands the group by removing the group name

Tip **Procedure**

1. Click the group name

		Jan
Fruits	kiwi	100
	mango	200
	papaya	50
	Total	350

This group (Fruits) has four items: kiwi, mango, papaya, and Total. Note that "Vegetables" is a single item, not a group of items

2. Choose Worksheet Ungroup Items

	Jan
kiwi	100
mango	200
papaya	50
Total	350

Ungrouped items and their data. Note that the data for each item is unchanged; only the group name is removed

See Also

Create Item Group: to collect items into a new group

Create Items: to add multiple items, which can then be selected and collected into a new group

Displays the Data Fill dialog box that allows you to fill a selected range of cells or item names

Procedure

Allows you to

- supply selected item names with a time series or text
- fill selected cells with sequentially stepped data

See Also

Edit Paste: to paste a copied selection to fill cells or items

Worksheet Settings: to format the information

Fills the item or cell selection with the specified value

Tip **Procedure**

1. Select the items or cells that you want to fill
2. Choose Worksheet Data Fill
3. Enter values for Start, Step, and End
   Start: enter a numeric initial value or date for first selected cell
   Step: enter an incremental value used to compute a cell from a previous cell. If no value is entered, Improv increases the value by one
   End: (optional) enter the last value. Stops here even if the selection is not filled
4. Click to choose one of the Step values
   Linear: new cell = previous cell + step
   Geometric: new cell = previous cell * step
   By days: new cell = previous cell + step days
   By weeks: new cell = previous cell + step seven days
   By months: new cell = previous cell + step 28 to 31 days
   By years: new cell = previous cell + step 365 to 366 days

   When filling values by days, weeks, months, and years, remember to apply a date/time format to the cells to fill them with actual dates
5. Click one of the Fill Cells options
   By row: fills the cells along the row
   By column: fills the cells down the column

See Also

Edit Add Item: to add an item to a worksheet

Create Items: to add multiple items to a worksheet

Sorts the items in a category or group by cell values or item names

Procedure (Sorting items by item names)

Procedure (Sorting items by cell content)

Allows you to

- arrange the items in a particular order
- sort according to what is important to you

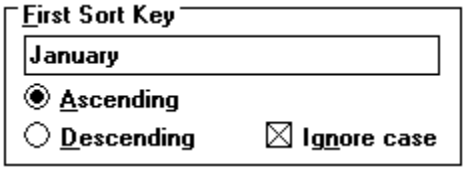
See Also

Tools User Setup: International: to specify collate options

Sorts the items in a category or a group by cell values

Tip **Procedure**

1. Select two or more contiguous items that you want to sort
2. Choose Worksheet Sort Items
   Improv displays the Sort Items dialog box
3. Click By cell contents
4. Enter the item names for the Sort keys. You must specify at least the first sort key; the others are optional



   Sort keys must include items (not groups) from any categories except the one being sorted
5. Choose Ascending or Descending. Check Ignore case if you want Improv to ignore capitalization
6. Click OK to execute the sort

See Also

Selecting in Improv: to make a selection for the sort
Sorting items by item names: to sort by item names
Tools User Setup: International: to set collate options

Sorts the items in a category or a group by item names

Tip **Procedure**

1. Select two or more contiguous items that you want to sort
2. Choose Worksheet Sort Items
   Improv displays the Sort Items dialog box
3. Click By item names
   Improv displays the options for sorting items by name
4. Choose Ascending to sort the selected items in alphabetical order. Choose Descending to sort the selected items in reverse alphabetical order. Check Ignore case if you want to ignore capitalization
5. Click OK to execute the sort

See Also

Selecting in Improv: to make a selection for the sort
Sorting items by cell contents: to sort items in a category or group by cell values
Tools User Setup: International: to specify the collate options

Hides the selected items, which includes their cells, in the current view
Keyboard shortcut: press Ctrl+H to hide the selection
Mouse alternative: resize the row or column until the word Hide appears in the resize box

Procedure

Allows you to

- focus attention on the more important elements of your data analysis by hiding the less important elements
- meet the needs of different audiences by creating several views, each of which displays different data from the same worksheet
- create data entry views by hiding the calculated data
- conceal information that, if you removed it, would break formulas

See Also

Selecting in Improv: to specify what you want to hide
Worksheet Show Items: to reveal selected hidden items
Worksheet Show All: to reveal all the hidden items in a worksheet
Edit Delete Item: differs from Worksheet Hide: useful to remove items from the worksheet and its views
Worksheet Collapse Group: differs from Worksheet Hide Items: useful to show only the summary item for a group
Worksheet Mark Cells: to determine which cells are entered, for creating a data entry view

To hide selected items, which includes their cells, in a specific view

Tip **Procedure**

1. Select the view where you want to hide items
2. Select the items you want to hide
   If you try to hide all the items in a category, Improv resets the view so that all items are visible
3. Choose Worksheet Hide Items
   Improv hides the item selection. A marker appears if you have checked Item markers on the View settings (Worksheet Settings)

		Jan
Eve's	apple	288
	kiwi	15
	mango	82
Le Jardin	apple	94
	kiwi	38
	mango	42

This view contains no hidden items

		Jan
Eve's		
	mango	82
Le Jardin		
	mango	42

This view of the same worksheet has hidden items, represented by the Items marker

See Also

Worksheet Show Items: to reveal the hidden items in an item selection
Worksheet Show All: to reveal all the hidden items in a view
Selecting in Improv: to specify what you want to hide
Worksheet Settings: View: to choose whether markers are displayed for hidden items
Worksheet Collapse Group: differs from Worksheet Hide Items: useful to display only summary data

Reveals the hidden items in an item selection

Mouse alternative: double-click each item marker

Procedure

Allows you to

- selectively display some of the hidden items in a view

		Jan
Eve's	apple	288
	kiwi	15
	mango	82
Le Jardin	mango	42

Only the store named Eve's was selected, so only the items hidden under Eve's are revealed

See Also

Worksheet Show All: differs from Worksheet Show Items: useful to reveal all the hidden items in a view at once

Worksheet Hide Items: to hide selected items

Worksheet Settings: View: to set options to show item markers

To reveal hidden items in an item selection

Tip **Procedure**

1. Select the view where you want to show hidden items
2. Make an item selection that includes the hidden items
3. Choose Worksheet Show Items

		Jan
Eve's	mango	82
Le Jardin	mango	42

Item markers confirm that items are hidden

		Jan
Eve's	apple	288
	kiwi	15
	mango	82
Le Jardin	mango	42

If you select Eve's and choose Worksheet Show Items, that instance of "kiwi" is revealed, and the marker is removed

Markers appear if Item markers is checked (Worksheet Settings, View)

See Also

Worksheet Show All: to show all the hidden items in the worksheet
Worksheet Hide Items: to hide selected items in a worksheet
Worksheet Expand Group: to display all the items of a collapsed group
Worksheet Settings: View: to set options to show item markers

Reveals all the hidden items in a view

Procedure

Allows you to

- display all the hidden items in the current view in one step, even if you've hidden the items incrementally
- guarantee that all items are visible

  If the items marker is not checked on the View page, you have no visual clue that some items in the view are not displayed. Use Worksheet Settings:View to set item markers

See Also

Worksheet Show Items: differs from Worksheet Show All: useful to show hidden items selectively

Worksheet Hide Items: to hide a selection in a view

Worksheet Settings: View: to control whether item markers are displayed for hidden items

Reveals all the hidden items in a view

Tip **Procedure**

1. Select the view containing hidden items you want to reveal
2. Choose Worksheet Show All. All the hidden items and associated data are displayed

Tip **Procedure**

Both the item and its data are hidden in the current view. Other views are unaffected

Tip **Procedure**

Choosing Worksheet Show All redisplays all the hidden items

See Also

Worksheet Show Items: differs from Worksheet Show All: allows you to reveal selected hidden items and their data
Worksheet Hide Items: to hide selected items
Worksheet Settings: View: to control whether item markers are displayed for hidden items

Adds a page break after the selected item, or clears a manually-set page break in a view

Procedure

Allows you to

- divide a large amount of worksheet information into smaller or more focused pieces for printed reports, such as a quarterly report for each department in the company
- combine several smaller worksheet pages into one for an expanded look at the data, such as all the product lines for a sales period

See Also

File Print: to print a worksheet or graph

Worksheet Settings: View: to set page break markers

To add a page break after a selected item, or clear a manually-set page break in a view

Tip Procedure

To add a page break to a row or column

1. Select an item in the row or column where you want a page break
   Improv will add the page break after the selected item
2. Choose Worksheet Add Page Break
   Improv displays a dotted line pattern to indicate the page break

To clear a page break

1. Select an item that borders a page break
2. Choose Worksheet Clear Page Break

See Also

Worksheet Settings: View: to set page break markers

Command	Action
Settings Style	Controls the appearance and layout of charts and objects in a presentation
Bring to Front Send to Back Group Ungroup	Controls the visibility of overlapping objects. Collects objects into a single object

Tip Procedure

Displays the InfoBox, which contains the Style panel and the settings pages for presentations (View page) and charts (Basics, Options, and Data pages). The settings change according to what is selected

Procedure

Allows you to

- set colors, fonts, line styles, and alignment using the Style panel
- display or hide a drawing grid
- align objects within your presentation

See Also

Presentation Style: to display the Style panel

Presentation Bring to Front, Send to Back: to control the order in which objects are overlayed

Presentation Group, Ungroup: to collect selected objects into a group

Chart Help: appears in a separate Help file. Choose Chart Help from the Help menu, or press F1 when you are working with a chart

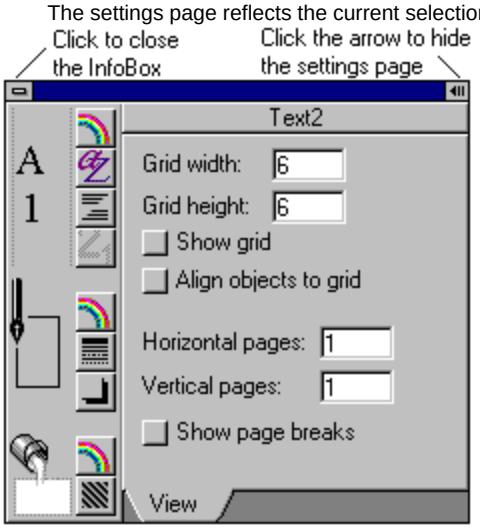
Procedure

To display a grid in a presentation and to align presentation objects to the grid

Procedure

1. Select a presentation window
2. Choose Presentation Settings to display the Style panel and View page. If you have a chart within your presentation window, you will see a different set of pages

   The settings page reflects the current selection



   You can leave the Style panel and settings pages open while you are working in Improv

3. Choose among the following options:

   Grid Options:

   Grid width: specify the distance between the vertical lines of the grid
   Grid height: specify the distance between the horizontal lines of the grid
   Show grid: displays the grid lines using the measurements set in the Grid width and Grid height options
   Align objects to grid: Checked, all objects in the presentation are aligned to the nearest vertical and horizontal grid lines when they are resized. Unchecked, you can move the objects between the grid lines

   Page Options:

   Horizontal pages, Vertical pages: specify how many pages the presentation should be divided into horizontally and vertically
   Show page breaks: displays vertical and horizontal page breaks on the screen

See Also

Presentation Style: to change colors, line styles, and fonts for objects in a presentation

Tip Procedure

Displays the Style panel, which controls text, line, and fill options. The options vary depending on what presentation object you select

Procedure

Allows you to

- enhance the visual understanding and appeal of a presentation by using color, line, and fill options to emphasize information
- design the presentation you want using color, pattern, and line styles for text, chart elements, and background

Tip Procedure

Click a button to display a popup of the options for the object you've selected. Here the alignment options for text are selected

See Also

Presentation Settings: View: to change the grid display options and page breaks

Create Draw: to draw lines, rectangles, ovals, and create text boxes and buttons in a presentation

Create Chart: to create a chart in a presentation

Create Hotview: to create a hotview of a worksheet linked to a presentation

Create Object: to create and embed an OLE object from another application in a presentation

Tip **Procedure**

To display the Style panel, which controls text, line, and fill options. The options vary depending on what presentation object you select

Style options

Tip **Procedure**

1. Make sure that a presentation is the active window
2. Choose Presentation Style to display the Style panel
3. Select text, lines, or objects in the presentation that you want to change
4. Click one of the buttons in the Text, Line, or Fill sections of the Style panel to display the popup
5. Click a button in the popup. The change is reflected in the selection

Tip **Procedure**

Select a circle, select a background fill color, then select a pattern. The oval appears with the selected color and pattern

See Also

Create Draw: to draw lines, rectangles, ovals, text blocks, and buttons in a presentation. The Style panel options can be used to change the appearance of any of these draw elements

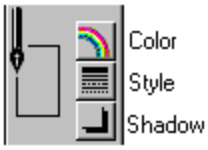
Create Object: to create and embed an OLE object from another application in a presentation

Select an object, then choose from the Style panel

Text options

You can change the color, font, and alignment for text in a text box, button, and chart (title, axis, and legend)

Lines and shadows options



You can change the color, line style, and line thickness for any object (rectangle, oval, line, text block, or chart border and plots), including embedded objects. You can add a drop shadow (two different styles, or none) to a rectangle, oval, text block, or chart border

Fill options

You can change the color and fill pattern for any solid object (except buttons), including embedded objects

See Also

Create Draw: to draw lines, rectangles, ovals, text blocks, and buttons in a presentation. The Style panel options can be used to change the appearance of any of these elements

Create Object: to create and embed an OLE object from another application in a presentation

Controls the order in which objects are overlayed in the presentation window

Allows you to

- create backgrounds to enhance or emphasize text
- design special elements by combining objects in an overlay design

Tip **Procedure**

1. Click an object to select it
2. Choose Presentation Send to Back to move the selected object to the back of a stack of objects. Choose Presentation Bring to Front to move the selected object to the top of the other objects

This example shows two versions of a company logo. The first shows the colored circle on top and selected. Choosing Send to Back overlays the colored circle with the white circle

See Also

Create Draw: to draw a line, oval, rectangle, text block, or button in a presentation

Create Chart: to create a chart in a presentation

Create Hotview: to create a hotview of a worksheet. The hotview is linked to a presentation

Create Object: to embed an object from another application in a presentation

Collects selected objects into a group, which can be moved, copied, or deleted as a single object

A group can be ungrouped when necessary

Procedure

Allows you to

- maintain the proportion of and spacing between objects as you move them

Tip **Procedure**

- protect complex groups of objects from being altered
- apply styles to all objects at once

See Also

Create Draw: to draw lines, rectangles, ovals, text boxes, and buttons, which can be grouped

Create Object: to embed an object from another application in a presentation

Commands	Action
SmartIcons...	Controls the contents of the SmartIcons set
User Setup...	Sets and displays global settings and defaults for the current and subsequent Improv sessions
Run Script... Attach Script...	Controls the creation and execution of scripts in Improv
Scripts attached by user	Lists the scripts added as menu items

Displays the SmartIcons dialog box to specify the contents and location of the SmartIcons set. Separate SmartIcons sets appear for worksheets, presentations, and scripts.

Buttons display dialog boxes to save or delete sets, attach scripts to custom icons, or specify icon size

Procedure

Allows you to

- customize a set of SmartIcons to suit your needs

SmartIcons can be arranged with spacers between functional groups. In this example, the first group controls File commands; the second group controls editing

- change the size of SmartIcons (Icon Size)
- attach scripts to icons (Edit Icon)
- group icons as a set (Save Set)
- relocate the SmartIcons set on your desktop (Position)
- save a collection of SmartIcons to use with specific files (Edit Icon)
- delete a collection of SmartIcons (Delete Set)

See Also

Saving a SmartIcons set: to save a collection of SmartIcons under a new name

Deleting a SmartIcons set: to delete a SmartIcons set

Editing an icon: to attach a script to an icon

Choosing the icon size: to choose between medium and large size icons

Window SmartIcons: to choose whether to display the SmartIcons set

Displays the SmartIcons dialog box to add or delete icons from a SmartIcons set. Separate sets appear for worksheets, presentations, and scripts

Tip **Procedure**

1. Choose Tools SmartIcons
   The SmartIcons dialog box appears with a list of Available icons and a list of the SmartIcons currently in the selected set
2. Click the list box to display the list of SmartIcons sets. Click the name of the set you want to change

   To add an icon to a SmartIcons set, click an icon in the Available icons list and drag it into the list for the selected set

   To delete an icon from a SmartIcons set, click an icon in the list for the selected set and drag it off the list

   To group icons in a SmartIcons set
   To group icons within a set, use the Spacer icon. Click the Spacer icon from the Available icons list and drag it into position on the list for the selected set

   To relocate a SmartIcons set on the screen
   Click the Position list and choose a location for the SmartIcons set: Floating, Left, Top, Right, Bottom
3. Click OK to save the changes. The appropriate SmartIcons set appears depending on whether you are working with worksheets, scripts, or presentations

See Also

Saving a SmartIcons set: to save a collection of SmartIcons together under a new name

Deleting a SmartIcons set: to delete a SmartIcons set

To specify a name, file, and directory of the defined SmartIcons set for worksheet, presentation, or script

Tip **Procedure**

1. Choose Tools SmartIcons to display the SmartIcons dialog box
2. Click and drag icons from the Available icons list to the list for the selected set
3. Click the Save Set... button to display the Save SmartIcons Set dialog box
4. Specify how you want the set saved
   Name of SmartIcons set: Type a name if you want to specify more than one set for your worksheet, presentation, or script
   File name: Improv generates a file name based on the name you enter for the SmartIcons set. Change the file name if you want. The file extension is .smi
   Directory: Improv displays the location of the icons directory
   Current sets: Lists the existing SmartIcons sets. If you click a file name, it appears in the File name
4. Click OK to save the changes

See Also

Tools SmartIcons: to specify the contents and position of the SmartIcons set

Window SmartIcons: to specify whether the SmartIcons set is displayed

Permanently removes the SmartIcons set for worksheet, presentation, or script

Allows you to

- discard SmartIcons sets that are no longer required

Tip **Procedure**

1. Choose Tools SmartIcons to display the SmartIcons dialog box
2. Click the Delete Sets button to display the Delete Sets dialog box
3. Click the set or sets you want to delete. Click OK to delete the sets

See Also

Tools SmartIcons: to construct a SmartIcons set
Window SmartIcons: to display the SmartIcons

Displays the Icon Size dialog box to specify one of the two icon sizes. Improv automatically adjusts a display size for SmartIcons based on the type of monitor you are using

Tip **Procedure**

1. Choose Tools SmartIcons to display the SmartIcons dialog box
2. Click the Icon Size button to display the Icon Size dialog box
3. Click an icon size (medium or large)
   Improv displays an icon in the chosen size
4. Click OK to save the change

See Also

Tools SmartIcons: to specify the contents and position of the SmartIcons set

Adds an icon that calls a script

Procedure

1. Choose Tools SmartIcons
   Improv displays the SmartIcons dialog box
2. Click the Edit Icon... button to display the Edit SmartIcons dialog box
3. Choose one of the icons from the Available icons list
   Improv provides five custom icons which can be attached to a script.

   You may also create your own .bmp files and put them in the Improv\Icons directory. These icons will appear in the Available icons list.
   Several icons are already connected to scripts. Do not modify these scripts.

   Load @Functions runs the ADDINS20.LSS script for registering the add-in functions

   Color Cells runs a script that changes the colors of cells based on conditions that you specify

   Load Template displays a custom dialog box that lets you select the worksheet template that you want to use
   Working Together icons will run the following Lotus applications if they are installed on your machine:
   1-2-3W, AmiPro, cc:Mail, Freelance, Notes, Organizer, and SmartPics
4. Enter a description of the icon in the Icon description box
5. Choose the name of the Script File and the Script Name that you want to attach to the icon
6. Click OK to attach the script to the custom icon
7. Add an icon to a SmartIcons set by dragging it from the Available list to the selected set

See Also

Create Script: to create a script
Tools SmartIcons: to specify the contents and location of the SmartIcons set
Adding and deleting in a SmartIcons set: to add or delete icons from a SmartIcons set
Using the Working Together SmartIcons set

Using the Working Together SmartIcons set, you can run a Lotus application from within Improv

Allows you to

- use the Lotus Working Together SmartIcons: 1-2-3W, AmiPro, cc:Mail, Freelance, Notes, Organizer, and SmartPics to launch or activate an application from within Improv without having to go through the Program Manager

Tip **Procedure**

To use the WorkingTogether SmartIcons Set

1. Choose Tools SmartIcons to display the SmartIcons dialog box
2. Click the list box to display the list of SmartIcons sets
3. Choose the WorkingTogether set and click OK
   The Lotus Working Together SmartIcons appear

To add Lotus program icons to an existing set

1. Choose Tools SmartIcons to display the SmartIcons dialog box
   The Working Together SmartIcons appear as separate Lotus program icons in the Available icons list
2. Click the list box to display the list of SmartIcons sets. Click the name of the set you want to change

   To add a Lotus application icon to a SmartIcons set, click an icon in the Available icons list and drag it into the list for the selected set

   To delete an icon from a SmartIcons set, click an icon in the list for the selected set and drag it off the list
3. Click OK to save the changes

To run a Lotus application from Improv

1. Click the Lotus program icon for the Lotus application you want to use
   Improv activates the application, or launches it if it has not yet been launched. The application is now the current application
2. To return to Improv, click the Improv icon or use the Program Manager

See Also

Tools SmartIcons: to specify the contents and location of the SmartIcons set

Adding and deleting in a SmartIcons set: to add or delete icons from a SmartIcons set

The Find Application dialog box appears if the Lotus application you are trying to run is not in your DOS path, is not registered in LOTUS.INI, or if the path in LOTUS.INI is incorrect

Note: The Lotus applications must already be installed on your machine

Tip **Procedure**

1. Choose a file type from List Files of Type
2. Choose the path of the application you want to launch from the Drives, Directories, and File Name lists
3. Click OK to launch the selected application

If the application pathname registered in your LOTUS.INI file does not exist

- Install may not have completed. Reinstall the application
- After installing the application, you renamed its directory or file name. Update LOTUS.INI

If the application is not in LOTUS.INI

- Older versions of some Lotus products may not register themselves in LOTUS.INI. Call Lotus about upgrading, add the application to your DOS path, or edit LOTUS.INI

If LOTUS.INI is missing

- The application may not have installed correctly. Reinstall.
- You renamed LOTUS.INI or moved it from your Windows directory. Change the name back to LOTUS.INI or move it to your Windows directory

Displays the User Setup dialog box to customize Improv to suit your working style. The settings take effect the next time the relevant commands are issued and remain in effect until you specify new changes or return to the default settings

Allows you to

- reduce keystrokes by specifying how you want to see your Improv environment, such as default font and whether you want to generate an automatic group summary for every group you create
- automate saving. Select a time interval at which Improv automatically saves open models
- save backup versions of your models

See Also

Tools User Setup: Settings and Save Options: to control your screen environment and the save interval

Tools User Setup: Font, Summary, Overlap, Units Options: to control the default font, automatic group summary, overlap information, and units of measurement

Tools User Setup: International: to control the International settings

Tools User Setup: Paths: to reassign default paths for the models, scripts, backups, and Startup model directories

Options for controlling your screen environment

Tip **Procedure**

1. Choose Tools User Setup to display the User Setup dialog box
2. Choose from the Settings. Default settings are checked. To change a setting, click the check box. The settings are preserved from one session to the next

Settings

Retain backup files

Unchecked: deletes backup versions of your models after File Close
Checked: retains files in backup directory
If you can't afford to lose changes you make to a model or script library file, periodically save and close the file, and then open and save it again to create a new backup version

Enable Edit Undo

Checked: records information to use Edit Undo/Redo
Unchecked: disables Edit Undo; improves memory and execution time

Auto-format cells

Checked: infers cell formats from values entered in cells
Unchecked: must explicitly set format for cells

Show warning messages

Checked: displays cautionary warning messages in an alert box
Unchecked: suppresses most warning messages

Replicate styles when adding items

Checked: copies style settings of the selected item to the new item
Unchecked: does not replicate styles
Formats can also be replicated using cut/copy/paste

Auto-Save (minutes)

Move the slider to set the interval at which you want the open model saved. Slide to the extreme left to turn off auto-save
Enter an auto-save interval by double-clicking and typing a number between 5 and 60 in the box

See Also

Tools User Setup: Font, Summary, Overlap, Units Options: to automatically create a group summary item, specify overlap reporting, and choose a default units measure

Tools User Setup: International: to control the international settings

Tools User Setup: Paths: to reassign default paths for the models, scripts, backups, and Startup model directories

Improv Handbook, Chapter 16, Customizing Improv: to learn more about User Setup options

Options for setting the default font and point size, automatic creation of a group summary item, display of overlap information, and choice of units of measurement

Tip **Procedure**

1. Choose Tools User Setup to display the User Setup dialog box
2. To change an option for the Default Font, Automatic Group Summary, Overlap Info, or Units, click the box to display the popup list. Click to select one of the options described below. The selected option appears in the box

Default Font
Specifies the default font for the model, including item names, cell values, formulas, script, and presentation text. The default font for item names and cell values takes effect the next time you create a new worksheet. The default font is Arial 9

Automatic Group Summary
Creates a default summary item each time you create a group. The named summary item (one for each group) appears as the last item in the group. A formula is also generated in the formula pane, calculating the value for the grouped items

None: a summary item is not automatically created when you create a group. The default is none
Total: provides a sum
Average: shows the average value
Minimum: shows the smallest value in the grouped items
Maximum: shows the largest value in the grouped items
Count: shows the number of non-blank entries in the grouped items
Standard Deviation: uses the *n* method (biased) to compute standard deviation of population data
Custom: allows you to create a custom formula

Overlap Info:

Off: suppresses audit information in formulas
On: displays a list of formulas that the current formula overlaps
Audit: provides detailed information about formula overlaps

Tip **Procedure**

Units:
Controls the default unit of measurement. The list options are centimeters, inches, points, and picas. The default is inches

Restore Defaults:
Returns the User Setup settings to the system defaults

See Also

Worksheet Settings: Options: to change the Overlap settings for a particular model
Tools User Setup: Settings and Save Options: to control your screen environment and set an automatic save interval

Displays the International dialog box, which controls the international settings. Most of the International settings that Improv uses as defaults are controlled by the International section of the Windows control panel

---

Collate Options: specifies how to sort letters and numbers

International (default)

Swedish

Nordic

ASCII: sorts letters first, then numbers

Numbers First (default), Numbers Last: available when Standard International, Swedish, or Nordic are selected. Allows you to specify how you want numbers treated during sorting

File Import Character Set

1-2-3 (.wk1): Choose LICS (Lotus International Character Set) (default), ASCII, or International

Text: Choose ANSI (default), International, or Country

See Also

Windows Control Panel: to change the country settings for your session

To reassign default paths for the Model, Scripts, Backups, and Startup model directories

Tip **Procedure**

1. Choose Tools User Setup to display the User Setup dialog box
2. Click the Paths button to display the Default Paths dialog box
3. Type the complete path name for each of the following directories:
   Models directory: Improv models are saved to this directory
   Scripts directory: Improv scripts are saved in this directory
   Backups directory: Improv file backups are saved in this directory
   Startup model: File that Improv uses when you start Improv or choose File New. You can create a model, save it in a file, and enter the directory and file name here. The next time you use File New, Improv uses the model as the default
4. Click OK to save the changes

See Also

Creating a template: to create a model that is used as the startup model

If a model or part of a model is selected, provides access to a list of all scripts in the model, along with scripts stored in any .lss files in the Scripts directory

If a library script is selected, provides access to the scripts in the library along with scripts stored in any .lss files in the Scripts directory

Procedure

Allows you to

- select a script from the list and run it
- debug a script

See Also

Tools Attach Script: to attach any Improv script to a menu item, key, or graphic, or to run a script when the model opens

Script Run: to run the current script

Editing an icon: to attach a library script to a custom icon

Debugging a script to locate and correct errors in a script

To select the script you want to run

Tip **Procedure**

To run a script

1. Choose Tools Run Script to display the Run Script dialog box
2. Click the file name (current model scripts and library scripts in the default script directory) from the File Name popup menu
3. Click a script name from the Script Name list box

   Script names are displayed in the script name list box only if scripts are associated with the current model
4. Click OK to run the selected script

To debug a script

1. Choose Tools Run Script to display the Run Script dialog box
2. Select the script you want to debug
3. Click Debug

   For detailed information about debugging a script, click here

See Also

Script Run: to run the current script

Editing an icon: to attach a script to one of the custom SmartIcons

Tip **Procedure**

To debug a script step-by-step

1. Choose Tools Run Script
2. Type the full path and file name of a script library file (.lss) and press Enter
3. In the Script Name list, select the script that you want to debug
4. Click Debug
5. The following buttons control view options for displaying lines of the script in the lower-left corner of the window
   Step Into: runs the script one line at a time, including functions and subroutines
   Step Over: identical to Step Into, except when the next line calls a function or subroutine. Runs the function or subroutine without stepping through one line at a time
   Continue: runs the script, beginning at the line of script shown and continues until the script encounters a STOP command or until the script ends
   Edit/Halt: stops debugging the script. If the script window is open, Improv moves the script window to the front and selects the line that was in the debug window

To debug a script by writing errors to the console

To isolate problem areas in a large script, include error-trapping routines and PRINT commands in the script. The console displays the text that you specify in the PRINT commands

See Also

LotusScript Help: to access detailed information about using LotusScript. Choose Script Help from the Improv Help menu or press F1 when you are in a script window to display the Script Help file

Improv Handbook, Chapter 17, Introduction to LotusScript

Attaches a script to a menu item, control-key combination, or graphic object; or runs the selected script when the model is opened

Procedure

Allows you to

- customize your model with scripts, which are executed using specialized menu items and key combinations

See Also

Editing an icon: to attach a script to one of the custom SmartIcons

To attach a script to a menu item, key, selected graphic (such as a button), or to run the script when the model is opened

Tip **Procedure**

1. Choose Tools Attach Script to display the Attach Script dialog box
2. Click the file name from the File Name popup menu
3. Click a script name from the Script Name list box
4. Choose one of the options:

   Add as menu choice: check the box and type the name of the menu item. The menu item appears in a list at the bottom of the Tools menu. Once a script has been attached to the Tools menu, you can also attach it to a keystroke as a shortcut

   Attach to keystroke: Ctrl +: provides a keystroke alternative to using the menu choice. Check the box and type the key to which you want to attach the script. (You must attach the script to a menu choice). Click CTRL and the key to run the script. If you define a CTRL+key combination that already exists (including accelerators), the new key overrides the existing key (see Help Keyboard for a list of keyboard accelerators)

   Run when model opens: check the box. The selected script runs each time the model is opened. Only one script can be selected

   Attach to selected graphic: available from a Presentation window. Click a graphic in the presentation window to select it, then choose Tools Attach Script to display the dialog box. Check the box to attach a script to the graphic
5. Click OK

See Also

Script Attach: to attach the current script to a menu item, or key, or to run when the model opens

Create Script: to create a script

Editing an icon: to attach a script to one of the custom SmartIcons

Displays a list of menu items that are attached to scripts

Allows you to

- execute an attached script from the list of available scripts

See Also

Tools Attach Script: to attach any Improv script as a menu item
Tools Run Script: to select any Improv script you want to run
Script Run: to run the current script
Editing an icon: to attach a script to one of the custom SmartIcons

Commands	Action
Improv Help Improv Basics How Do I? Formulas Functions	Presents handy information to help you build an Improv model and use formulas and functions to calculate
Using Help Keyboard	Describes how to use Improv Help and keyboard equivalents
Script Help	Provides a detailed reference for LotusScript commands.
Chart Help	Describes Lotus Chart
About Improv	Describes which version of Improv you are running

Improv provides an Improv Help file, a Chart Help file, and a Script Help file

Improv Help describes Improv commands, tasks, and concepts and definitions

Chart Help provides information on enhancing charts

Script Help contains an alphabetical reference to LotusScript

Help is available by

- choosing Help from the menu to select the topic you want
- clicking the F1 key for context-sensitive Help
- clicking the Help button (a question mark (?)) in the upper right corner in each dialog box

You can also print individual pages of Help

Allows you to

- peruse the Contents page to see what chapters are available in Help
- locate a specific topic using the Search button
- obtain help for the current Improv context using the F1 key
- print selected pages for quick reference
- use Bookmark to mark frequently used pages for ready reference

---

See Also

Printing Help Pages: to print specific help pages

Navigating in Help: to find the information you want

Help provides multiple paths to the information you want:

To browse through topics

1. Click the Contents button at the top of the Help window to display the list of chapters
2. Click the topic that best fits your question and level of experience in Improv

   The first page of the selected chapter appears. Each chapter opens with a table of contents for that chapter
3. Click a topic to move to a more specific topic, or click the Browse button (<< or >>) to move linearly through the chapter

To search for a particular topic

1. Click the Search button at the top of the Help window to display the Search box
2. Type the topic for which you want Help. You can also scroll through the Search list to locate the topic you want
3. Click Show Topics to display a list of related topics
4. Select a topic, then click Go To

To back track through Help topics

- Click the Back button at the top of the Help window to move back through the pages of Help you have visited
- Click the History button at the top of the Help window to display a list of the topics you visited. Click any topic to move to that page

To use context-sensitive help

1. Press the F1 key

   Improv displays the Help page appropriate to your current context and selection. Once Help is launched, you can move to other topics of interest, or search for more information, or return to your model

See Also

Printing Help Pages: to print the specified online Help page

Prints the specified online Help page

Allows you to

- print selected pages of the online Help for reference

Tip **Procedure**

1. Display the Help window and make it the current window
2. Choose the Help page that you want to print
3. Choose File Print from the menu of the Help window

See Also

File Print Setup: to specify the printer, paper source, and orientation

Describes the keyboard equivalents and shortcuts

Control	Command
Ctrl+A	Edit Select All
Ctrl+C	Edit Copy
Ctrl+G	Create Item Group
Ctrl+H	Worksheet Hide Items
Ctrl+K	To manually check formulas
Ctrl+M	Worksheet Mark Cells/ Mark Formulas
Ctrl+N	File New
Ctrl+O	File Open
Ctrl+P	File Print
Ctrl+S	File Save
Ctrl+V	Edit Paste
Ctrl+W	Create Worksheet
Ctrl+X	Edit Cut
Ctrl+Z	Edit Undo

Accelerator	Command
Enter key	Edit Add
Delete key	Edit Delete
= (equal sign)	Create Formula

Function Key	Action
F1	Help
Alt+F1	Compose sequence. See the *Handbook,* Appendix E, Improv Character Set for details
F2	Edit the current selection
F3	Execute highlighted statements in the Console
Alt+F3	Displays the Run Script dialog box
Ctrl+F4	Close document
Alt+F4	Exit Improv
F6	Switch between the data and formula pane

Ctrl+F6	Display next document
Alt+F6	Zoom the data pane or formula pane
F9	Recalculate

See Also

Tools SmartIcons: to assemble a SmartIcons set to suit your needs

Displays a panel with information about the Improv version you are running

See Also

Improv Start Here: to answer questions about installation. This print booklet provides important information about your version of Improv

Improv Registration Card: to register your copy of Improv

Command	Action
Browser Console	Displays the Browser for the current model. Displays a window for LotusScript
SmartIcons Status Bar	Controls the display of the SmartIcons set and the status bar
Cascade Tile	Arranges the open windows
Window list	Lists the names of all open windows

Displays a Browser window, which lists all the elements of the model, including worksheets, views, presentations, and scripts, as well as the notes accompanying each. Each model has its own Browser

Procedure

Allows you to

- browse through the contents of a model
- add a descriptive note for each element
- rename the worksheet, view, script, or presentation
- delete elements from a model
- bring a particular worksheet, view, script, or presentation to the front and make it the current window
- cut, copy, and paste elements between models

Tip **Procedure**

See Also

Create Worksheet: to create a new worksheet in the current model
Create View: to create a new view that contains a copy of the current worksheet
Edit Delete View: to delete a selected view of a worksheet
File Save: to name and save the file contaiing an Improv model
Learning worksheet terms: to learn Improv terminology
Edit Copy: to copy a worksheet, view, presentation, or script
Edit Paste: to paste a worksheet, view, presentation, or script from the clipboard

To display a list of all the elements of a model (worksheets, views, presentations, scripts). Use the Browser to open, rename, copy, delete, annotate, or make current any of the elements

Tip **Procedure**

Choose Window Browser to display the Browser for the current model. You can leave the Browser open while you are working in Improv

To rename an element

1. Double-click the worksheet, view, presentation, or script name in the Browser

Tip **Procedure**

2. Type the new name. Press Enter to confirm the edit

To annotate

1. To annotate, click the button at the bottom of the Browser to open the Note area
2. Click the Note area and begin typing
3. To close the Note area, use the mouse to resize the right edge of the Browser window as far left as possible

Tip **Procedure**

To cut, copy, paste, or delete an element

1. Select an element in the Browser
2. Choose the appropriate command from the Improv menu (Edit Cut, Edit Copy, Edit Paste, Edit Delete), or use the SmartIcons

To open or make current a closed or minimized element

- Double-click the icon for the element you want to open or make current

See Also

Improv Basics for New Users: to learn about Improv concepts and terminology

Create Worksheet: to create a new worksheet in an existing model

Create View: to add a new view of a worksheet to an existing model

File New: to create a new model, including a new Browser

Create Presentation: to create a new presentation

Create Script: to create a new script

Displays a console window to display output from LotusScript and Improv specific functions

Allows you to

- read output from a script

See Also

Script Record into Script: to record a script

Create Script: to record a script

Controls the display of SmartIcons

Mouse shortcut: click the SmartIcons icon (as shown above) that appears in the status bar

Allows you to

- keep the SmartIcons set on display to use for commands
- choose not to display the SmartIcons to increase space for large models

Tip **Procedure**

- Choose Window SmartIcons. Check SmartIcons to display the SmartIcons set. Uncheck SmartIcons to hide the SmartIcons set
- Click the icon in the status bar at the bottom of the screen to hide or show the SmartIcons set

See Also

Tools SmartIcons: to specify which SmartIcons to include in the set and where the SmartIcons set is positioned on the screen

Controls the display of the status bar. The status bar displays information about the current selection:

If the selection is in the data pane, then style, format, and selection information appear in the status bar

If a formula is being edited, then the formula bar appears with mathematical symbols, keywords, and the Functions button

If a formula is selected, the overlap button is available to select which of the overlapping formulas calculates cell values

---

Allows you to

- save room on the workspace by suppressing the display of the status bar
- display the status bar to easily change the styles of selected text without using the menu or the InfoBox
- change the priority of formulas when formulas overlap
- use the formula bar to point to formula information, such as operators and Function names, while creating a formula

Tip **Procedure**

---

1. Choose Window Status Bar
2. Check to display the status bar. Uncheck to suppress the display of the status bar

---

See Also

Formula Bar: to learn about using the formula bar for creating formulas

Worksheet Style: to display the Style panel for changing style settings for a selection

Window SmartIcons: to control the display of SmartIcons

Worksheet Settings: to display the InfoBox for changing worksheet settings

Arranges the open windows on the desktop so that the title bar and the left vertical edge of each window are visible

Allows you to

- maintain access to multiple windows, including views and presentations. Cascaded windows are useful when you want to display a large portion of a single window

Tip **Procedure**

- Choose Window Cascade from the menu
  Improv displays all the open windows, with the current window displayed on top

See Also

Window Tile: to arrange open windows side by side so that each takes up an equal portion of the workspace

Arranges open windows side by side so that each takes up an equal portion of the workspace

Allows you to

- compare two or three worksheets or views side by side, maximizing the screen area
- display the open windows without overlaying them as you move among windows

Tip **Procedure**

- Choose Window Tile from the menu
  Improv displays all the open windows

See Also

Window Cascade: to arrange the open windows so that the title bar and part of each window is visible

Lists the names of all open windows in an application

Allows you to

- access any window, even if it is iconized or hidden
- select a window title to bring it to the front

Tip **Procedure**

- Choose Window List from the menu
  A list of the open windows appears at the bottom of the menu. A check mark appears beside the active window

See Also

Window Browser: to display a list of all the windows in a model and the note for each window

Click a green, underlined topic below and select from the list that appears. Click the Back button above to retrace your steps

---

Build a worksheet

Create and use an Improv model

Use item groups and categories effectively

Enter data

Modify data

Write formulas

Use formulas effectively

Create different views of data

Format data

Print or send a model

Make charts and presentations

Write scripts

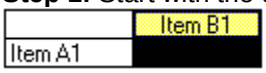
Get around in Improv

Customize Improv

For more how-to topics, click the Search button above

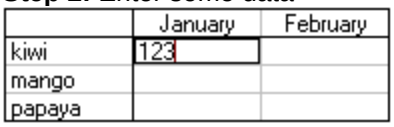
It's easy to build a simple worksheet. To get the feel of using Improv, follow these steps. Compare your worksheet with the "click here" examples

Step 1: Start with the default Improv worksheet (Create Worksheet or File New) and add items to it



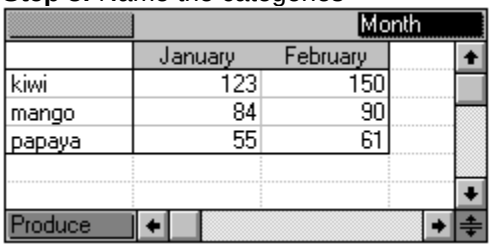
Click Item B1 to select it. Type January
Press Enter to get another item (click here)
Notice that Improv recognizes January and automatically names the new item
Click Item A1 and type in a new name (click here)
Press Enter to add another item. Name it. Add and name more items; the cells also replicate (click here)

Step 2: Enter some data



Click a cell to select it, then type in a value. Here the value 123 is entered in the cell named kiwi:January. The item names uniquely define the cell

Step 3: Name the categories



A category holds items. A worksheet starts with two categories. Click a category tile and type a new name. In this example, the row items are in the category Produce and the column items are in the category Month

See Also

Learning worksheet terms: to familiarize yourself with Improv terms and concepts

Create Items: to add multiple items at one time

Create Category: to add a new category and items to a worksheet

Rearranging Categories: to change the organization of the items and categories in a model

Edit Cut: to cut an item and its cells, cell values, or one or more formulas to the clipboard prior to pasting them in a new location

Edit Delete Item: to remove an item and its cells from its location. Undo is available for this command

Edit Delete Category: to remove a category that has a single remaining item

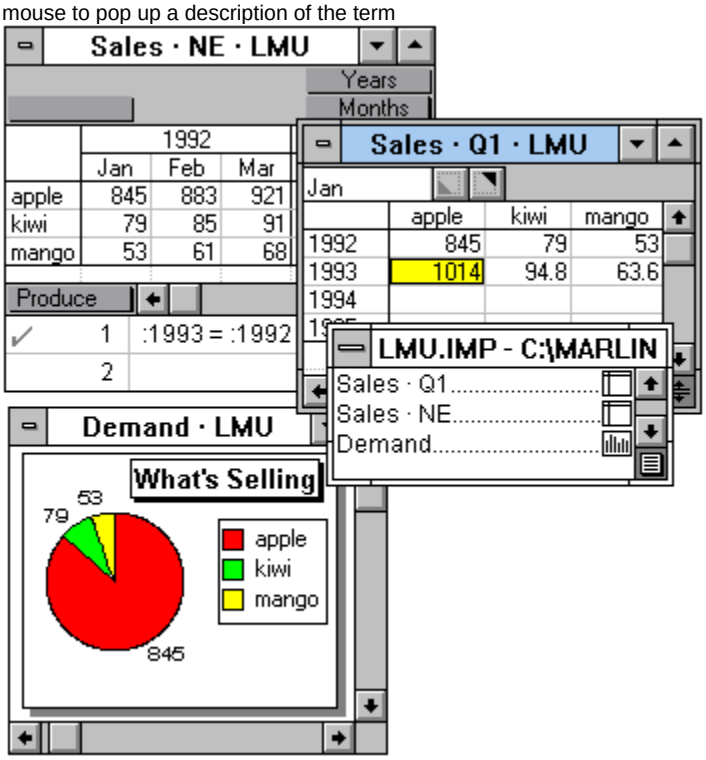
When your worksheet doesn't work the way you want, you can make changes ... or start fresh with a new worksheet

What can you do to get the worksheet you want?

- If a category is in the wrong place, move it by clicking a category tile and dragging the title to a new location. The new orientation may clarify what you want to emphasize in the worksheet (Rearranging Categories)
- If the worksheet contains a sparse matrix, hide the items that do not contain data (Worksheet Hide)
- If you have extra elements, such as items, select and then delete them (Edit Delete)
- Consider grouping related items for ease of use (Create Item Group)
- Add a category when you want to handle more information, such as adding a category for Years (Deciding between groups and categories)
- If you make a mistake, often you can undo (or redo) the last operation (Edit Undo)
- If all else fails, you can always start over using a new worksheet (Create Worksheet) or a new model (File New)
- If you want to try a different approach to your model, follow the planning guidelines in Planning an Improv model

A model consists of one or more worksheets, views, presentations with charts, and scripts, saved together in a named file. To open a closed part of the model or bring an open window to the front, open the Browser (Window Browser) and double-click the appropriate icon

To learn about the different parts of a model, move the cursor over the picture below. When the cursor changes to a hand, click the mouse to pop up a description of the term



You build an Improv model by adding worksheets, views, scripts, and presentations with charts to a named file.You can add and delete elements in the model as your needs change

To delete an Improv model, close it. Then use the Windows File Manager accessory

- Create Worksheet: creates a new worksheet in the current model
- File New: creates a new file for a new model; differs from Create Worksheet
- Create View: creates a new view of a worksheet
- Create Presentation: creates a presentation to hold charts, hotviews, and objects
- Create Chart: creates a chart in a new or existing presentation
- Create Hotview: links data in your worksheet to a presentation
- Create Script: creates a script
- Naming and annotating using the Browser: displays the Browser, which is used to manage the contents of a model

The Browser lists the worksheets, views, scripts, and presentations in the current model. Use the Browser (Window Browser) to name and annotate the elements of a model

Tip **Procedure**

The left panel lists the worksheets, views, presentations, and scripts in a model. The note for the selected model element appears in the Note area on the right

---

Tip **Procedures**

To use the Browser

Choose Browser on the Window menu to display the Browser for the current model. The open Browser floats on top of the Improv windows

To annotate a model

1. To display the Note area of the Browser, click the button at the bottom of the Browser
2. **To enter text,** click the note area, then type

   To edit text, double-click the note area

   To delete text, double-click and drag to select text you want to delete

To change a name

1. Double-click the part of the name you want to change
2. Type in the new name for the worksheet, view, script, or presentation and press Enter

   If you change a worksheet name, all instances of the worksheet name are updated

---

See Also

Window Browser: for more information on the Window Browser command

Navigating within a model: to identify the parts of a model

Learning worksheet terms: to see the parts of a worksheet

In conventional spreadsheets, different areas of a sheet serve different purposes. In Improv, multiple worksheets handle different kinds of information. Formulas link data among the separate worksheets. You can expand your worksheet with multiple categories and add detail with groups. Consider the following questions when planning an Improv model

---

When do I add a new category?

Try two categories initially. Wait to see if you need more categories before adding them (Create Category)

- Consider adding another category for new kinds of information. For example, add a category to track sales by years (example)

How do I build a worksheet that grows along with my data?

- You can always add a new item for a new line of products or for a new financial period. Insert an item anywhere you want
- You've been measuring expenses by months, but now you want to track a new year. Or you've had a single store, but now you've opened a new branch. Use a category to replicate the structure you already have (example)

What kind of information do I have?

- Repeating information such as years, months, inventory, business locations, can each be made into a category (example)
- A subset of information, such as different models of the same appliance, employee travel expenses, or varieties of fruit, can be made into a group (example)

Should I use groups or categories?

Groups handle information that requires more detail. Categories handle information that is broader based

- A group shows details of items, such as specific expenses or types of fruits, and can contain an automatic summary calculation (example)
- A category describes the big picture, such as Produce, Stores, and Years

When do I add a new worksheet to a model?

- Lookup tables, assumptions, or basic parameters for the model, such as Interest Rate or Per Quarter Growth Factor, can be stored in a separate worksheet that holds variables
- You can create separate worksheets for component data, such as departmental budgets
- Other worksheets may show compiled data and summary information
- What-if scenarios and predictions based on your data might be contained in another worksheet
- See *Improv in Action* for examples of worksheets and views. A list of the model's worksheets and views appears in each chapter

When do I add a new view to a model?

- A view created for an executive can focus on the bottom line
- A view created for a report allows you to format the worksheet to emphasize points for your audience
- A view for data entry can be formatted to show only the cells that hold hard data

---

See Also

Create Worksheet: to create a new worksheet to handle different kinds of information

Create View: to create a new view of a worksheet for customizing the display of the worksheet

Deciding between groups and categories: for more on how to structure information in groups or categories

Connecting worksheets using formulas: to link data from one worksheet to another using intersheet formulas

Categories and groups are used to organize information in a structured way

- Categories handle general levels of repeating information, such as "Years," "Months," "Produce," and "Store"

		Jan		Feb	
		1992	1993	1992	1993
Le Jardin	kiwi	123	148	150	180
	mango	84	101	90	108
	papaya	55	66	61	73.2
Eve's	kiwi	38	45.6	39	46.8
	mango	52	62.4	53	63.6
	papaya	20	24	18	21.6

Store | Produce

1 :1993 = :1992 * 1.2

Worksheets with multiple categories require fewer formulas than you might expect. When you add new items and data to Store or Produce, the formula automatically calculates 1993. In this example, the two stores sell the same produce

- Groups provide an extra level of detail for subsets of an item, such as varieties of apples or detailed personnel costs

Months
Years

		Jan		Feb
		1992	1993	1992
Le Jardin	kiwi	123	148	150
	mango	84	101	90
	papaya	55	66	61
Eve's	apple	850	870	865
	pear	330	335	280

Store

Groups allow you to create unique item combinations. In this example, each store sells different produce. Groups can also be collapsed to display only the group name and a group summary calculation

Tip **Procedures**

To organize with a category

Use a category to see your data in different arrangements and to expand your model without creating new formulas

1. Click a category tile. The new category will be added beside or above the selected tile
2. Choose Create Category
3. Type a new name for the category
4. Add items to the new category

To organize with a group

Use a group when you want an extra level of detail for items

1. Select contiguous items
2. Choose Create Item Group
3. Type a name for the group
4. Add items to the group, including an item for calculating a group summary (Worksheet Add Group Summary)

See Also

Create Category: to add another category to the current worksheet

Rearranging categories: to rearrange the categories and items for a new look at the same information

Create Item Group: to create a group

Worksheet Add Group Summary: to add a group summary item to a group and automatically create the formula to calculate the values for the group summary

Planning an Improv model: to consider other questions you should ask as you plan your model

You can create a different arrangement of the data relationships in a worksheet without changing the data. By rearranging the categories, you can explore possibilities and discover new insights based on the knowledge you gain from reorganizing your data

The same worksheet can look very different depending on where you move the category tiles (example)

Tip **Procedure**

- Click a category tile and drag it to a different category area (row, column, or page area)

  Any category area can contain a maximum of four category tiles

  A worksheet can contain up to 12 categories

See Also

Worksheet Hide Items: to modify the appearance of the worksheet by hiding selected items

Create View: to create a new view for comparing two different arrangements of the same worksheet

You can collect related items into a single group (Create Item Group)

You can

- add a group summary item (Worksheet Add Group Summary). To automatically add a group summary item whenever you create a group, check the box in the User Setup dialog box (Tools User Setup)
- ungroup the items (Worksheet Ungroup Items)
- collapse a group to display just the group summary item (Worksheet Collapse Group)
- expand a group to show all the items (Worksheet Expand Group)

You enter data in cells. You enter formulas in the separate formula pane

To enter data, click a cell and type. To edit, double-click the cell

You can

- fill a range of cells or items (Worksheet Data Fill)
- enter dates and times: type the date or time number in an Improv format (see *Improv Handbook,* Chapter 4, Entering Data)
- auto-format cells as you enter numbers (see *Improv Handbook,* Chapter 4, Entering Data)
- enter numbers as text: precede the number with double quotes, for example a zip code, "02178
- enter numbers as fractions: double-click the cell and type a plus sign followed by the fraction, for example +1/3
- cut, copy, paste (Cut, copy, and paste to move data)
- sort data (Worksheet Sort Items)

See Also

Selecting in Improv: to select cells or formulas and enter data

Editing your work: to modify data you enter

Pointing to create a formula: to write formulas to calculate cell values

You can establish a link between Improv and Notes to exchange data by creating a special worksheet named Notes Fields in your Improv model and embedding it in the Notes document

Allows you to

- use Improv data in a Notes document
- maintain one set of data in an Improv worksheet and access and update it in Notes

Tip Procedure

You can use an existing form or create a special form. Be sure the field names in the Notes Fields worksheet in Improv correspond to the field names in the Notes document

Creating the Notes Form

1. Launch Notes
2. Select a database and choose Design Forms
3. Choose a form and press the Edit button
4. Create and name the fields. Improv supports text and numbers in editable fields only

   Use the field names in the Notes Fields worksheet in Improv
5. Create a Rich Text field to embed your Improv worksheet

Creating the Worksheet

1. Open the model (File Open) containing the data you want to use in the Notes document, or create a new Improv model (File New)
2. Create a new worksheet (Create Worksheet) named Notes Fields, which contains one category

   Use Edit Delete Category to delete Category B
3. In the Notes Fields worksheet, create item names that correspond to the fields in the Notes document

   Do not use groups in the Notes Fields worksheet

   You can use intersheet formulas to transfer data into or out of the Notes Fields worksheet
4. Save the Improv model, then embed part of the model in the Notes document

   To embed, select part of the model, such as a small presentation window or part of the worksheet, and copy it to the clipboard. Choose Edit Paste Special Embed from the Notes Edit menu

Using Notes Data Exchange

1. From Notes, double-click the embedded document to launch Improv and load the model

   Improv extracts the current field values from the Notes document and loads them into the appropriate cells in the Notes Fields worksheet. Notes will not, however, overwrite a calculated cell value in the worksheet. You can work as usual in the Improv model
2. Choose File Update and close the model

   The current cell values are copied back to the corresponding fields within the Notes document. You can then switch back to Notes to see the new field values

Making a selection is the first step for adding, deleting, copying, and moving elements in a worksheet, chart, presentation, or Browser. You also select when you want to format or change styles

Always select first, then use the commands or SmartIcons. To select something, click it. The selection is highlighted

- Selecting items and their cells: to select items or to limit the scope of your selection
- Selecting cells: to select cell values
- Selecting the contents of the data pane: to select all the items and cells at once, click the select-all box (example)
- Selecting formulas: to select or edit a formula, or to highlight its calculated cells
- Selecting a category: to move or delete a category, edit its name, or add a new category beside it
- Selecting in the Browser: to rename or copy any of the elements of a model
- Selecting objects in a presentation: to move, resize, delete, or change the styles of objects and charts

An item selections lets you act on an item, which includes the item name and its associated cells. You can limit an item selection by selecting only the item name or by refining the selection

Tip **Procedures**

		Jan	Feb	Mar
Le Jardin	kiwi	123	150	148
	mango	84	90	92
Eve's	kiwi	38	39	42
	mango	52	53	58

Click the item name in a column to make a selection of one item and its cells

		Jan	Feb	Mar
Le Jardin	kiwi	123	150	148
	mango	84	90	92
Eve's	kiwi	38	39	42
	mango	52	53	58

Click the item name in a row to make a selection of one item and its cells

		Jan	Feb	Mar
Le Jardin	kiwi	123	150	148
	mango	84	90	92
Eve's	kiwi	38	39	42
	mango	52	53	58

Click and drag across item names to extend the selection

Limiting an item selection

Tip **Procedure**

Choose Edit Select Item Names to select just the item names. This is useful when you want to selectively change the style settings

		Jan	Feb	Mar
Le Jardin	kiwi	114	122	108
	mango	92	97	93
Eve's	kiwi	28	30	50
	mango	39	46	72

Click to select an item and then Shift-click to refine the selection. In this example, the selection includes only the January sales of fruit at Le Jardin

See Also

Editing your work: to edit a selection

Selecting cells: to select cell values

Edit Select Item Names: to select only the item names

Making a formula more specific: to limit the scope of a formula by using a refined selection

Cell selections let you perform an operation on only the cells

Select cells when you want to

- copy selected cell values to another location
- fill selected cells with values (Worksheet Data Fill)
- delete manually entered values, or clear calculated cell values
- change the style settings of cells for emphasis

Selected cells cannot be used to

- copy formulas that calculate cells. In Improv, formulas are written, edited, and copied in the formula pane only

Tip **Procedure**

	Jan	Feb	Mar
kiwi	123	150	148
mango	84	90	92
papaya	55	61	60

Click a cell and drag to enlarge the selection

See Also

Selecting items and their cells: to select an item and its associated cells

Edit Select Cells Only: to narrow an item selection from items and cells to cells only

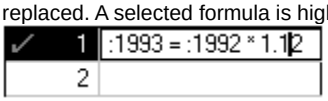
Worksheet Style: to change the style settings for selected cells

Worksheet Data Fill: to fill selected cells with values

Select a formula to edit the formula text, delete it from the formula pane, add a new formula after it, or mark the cells it calculates

Tip **Procedure**

To select a formula, click the formula line. A selected formula can be deleted from the worksheet, cut or copied to the clipboard, or replaced. A selected formula is highlighted



To edit a formula, double-click the formula line. A formula line in edit mode displays a blinking vertical line

Tip **Procedure**

To mark cells calculated by a formula, click a formula to show which cells are calculated by that formula. (Check Auto-mark calculated cells in the Options settings)

To delete a formula, select it, then choose Edit Delete Formula

See Also

- Pointing to create a formula: to create formulas by pointing to items and the formula bar
- Edit Delete Formula: to delete a formula
- Worksheet Settings, Options page: to set the auto-mark feature to show cells calculated by a selected formula
- Worksheet Settings, View page: to set the auto-mark feature to show the formulas calculating selected cells
- Making a formula more specific: to limit the scope of a formula by using a refined selection

Select a category tile to move or delete it, edit its name, or add a new category above or beside it

Tip **Procedure**

Click a category tile to select a category. The items in the category are also highlighted

Tip **Procedure**

Select a category to

- name a category to describe its items. For example, Product is more descriptive than Category B (Editing item names and category names)
- add a new category. A worksheet can have up to 12 categories, with four in each area (row, column, page) (Create Category)
- rearrange the data in a worksheet by dragging the selected category tile to another location (Rearranging categories)
- delete a selected category to change the structure of the worksheet and simplify what you are analyzing (Edit Delete Category)

See Also

Selecting items and their cells: to select items and cells in a category

Edit Undo: to replace a deleted category

You can replace or modify values in cells, edit formulas, change item or category names, and change chart or presentation text

To replace data, click and type a new entry

To modify data, double-click and correct the existing entry

See the following sections for detailed information about editing in Improv

- Editing cells: to change text or numbers in cells
- Editing item names, category names, and presentation text: to make an item or category name meaningful, or to modify text in a presentation
- Editing formulas: to correct or modify formulas

You can edit text or numbers in cells

Note: formulas are created and edited in a separate formula pane, not in the cells

Tip **Procedure**

To replace the entire value in the cell

1. Click the cell that you want to edit
2. Begin typing the new value
   Improv switches to edit mode, deletes the value in the cell, and replaces the value with the new characters
3. Press Enter to confirm the edit, or press Esc to restore the original values

To edit the value in the cell

1. Double-click the cell to switch to edit mode
2. Click to position the vertical bar where you want to make the change
3. Press Backspace or Delete to delete characters, or type new characters
4. Press Enter to confirm the edit

To edit a calculated value

If the cell contains a calculated value, Improv displays an alert box noting that the value you are replacing or editing will overlap a calculated value

Click OK to change the value

Click Cancel to close the alert box without changing the value

See Also

Resize rows, columns, and more: to widen the cell display area when values don't fit

Edit Clear Cells: to clear the cell of values calculated by a formula

To change item names, category names, and text in a presentation

Tip **Procedure**

To replace text

1. Click the name or text that you want to edit
2. Type the new name or other text
   Improv switches to edit mode, deletes the entry, and replaces it with the new characters
3. Press Enter to confirm the edit, or Esc to restore the original values

To edit existing text

1. Double-click the name or text to enter edit mode
2. Position the vertical bar where you want to add or delete characters
3. Press Delete or Backspace to delete characters. Type to add new characters
4. Press Enter to confirm the edit

See Also

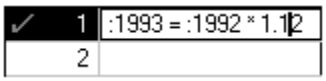
Worksheet Style: to change the style settings of text, such as font and color

To edit the text and operators of an existing formula to correct errors, or to replace the entire formula

Tip **Procedure**

To edit the formula

1. Double-click the formula you want to edit



   The formula displays a blinking vertical line

2. Position the vertical bar where you want to make the change
3. Press Delete to delete characters. To enter new characters, begin typing
4. Press Enter to complete the formula, or Esc to restore the original text

To replace the entire formula

1. Click the formula you want to replace
2. Begin typing or pointing to enter the new formula.

   Improv erases the formula, switches to edit mode, and replaces the text and numbers with the new characters

3. Press Enter or click to the left to complete the formula, or press Esc to restore the original text

See Also

Formula Basics: to write and use formulas in Improv

Formula status indicators: to alert you to errors that require editing

Pointing to create a formula: to create a new formula by pointing

Cutting and copying to the clipboard provide a way to move items, cell values, formulas, charts, and presentation objects from one location and paste them in another

You can

- cut elements to the clipboard to move them elsewhere (Edit Cut)
- copy elements to the clipboard to duplicate them elsewhere (Edit Copy)
- paste cut or copied elements from the clipboard into a new location (Edit Paste)
- paste values or styles into cells, combine values in cells, or paste and link data or objects from one application to another (Edit Paste Special)
- cut, copy, and paste views, presentations, and scripts from one model to another (Window Browser)

Improv supports importing and exporting data, linking data using Dynamic Data Exchange (DDE), and linking or embedding objects using Object Linking and Embedding (OLE)

Import and export worksheet data and text files

- import data from Lotus 1-2-3 and Excel files (Importing a worksheet)

  In converting .wk3, .wk1, and .xls files into Improv (.imp) files, Improv imports data based on the choices you make in the Worksheet Import dialog box
- import text (Importing a text file)
- export data from an Improv model (Exporting a worksheet)
- export text (Exporting a text file)

Link data (DDE)

- link data from another Improv model or another application to an Improv worksheet using Edit Paste Special with the Paste Link option (Connecting models or applications using linked formulas (DDE))

  Improv creates a formula to document the data source

Link or embed objects (OLE)

- link an object from another application to an Improv presentation using Edit Paste Special with the Paste Link option (Linking or embedding objects in a presentation (OLE))
- embed an object from another presentation in an Improv presentation using Edit Paste Special (Linking or embedding objects in a presentation (OLE))
- create and embed a new object in a presentation using Create Object (Creating an object)

See Also

Improv Handbook, Chapter 14, Integrating Improv with Other Applications: for more information about DDE and OLE

When two formulas compete to calculate the same cell, a formula overlap results at the intersection of two items (example).The highest numbered formula in the formula list calculates the cell value

Tip **Procedure**

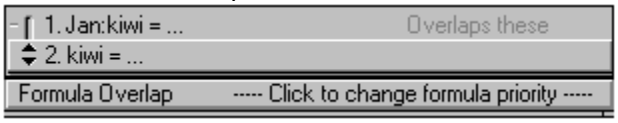
To change the priority of overlapping formulas

If you want a lower numbered formula to calculate a cell, change the order of the formulas

1. Click an overlapping formula

   The status bar at the bottom of the window displays a button labeled Formula Overlap ----Click to change formula priority ----

2. Click the overlap button



3. Click and drag the slider to move the formula to another position in the list

See Also

Worksheet Settings: Options: to control the display of overlap messages in a worksheet

Tools User Setup: Font, Summary, Overlap, Units Options: to change the default for the display of overlap messages

In Improv, you can use one formula to calculate many cells

General formulas use item names to calculate values for all the cells named by an item. You can also use group or category names in general formulas

Recurrence formulas calculate a series of values, where each new value is based on the previous value. For example, the beginning inventory for a month might be based on the ending inventory of the previous month. You must enter or calculate the beginning value

Tip **Procedure**

To create a general formula

	1991	1992	1993	1994
kiwi	800	1000		
mango	1000	2000		
TOTAL	1800	3000	0	0

Produce

✓ 1 TOTAL = sum (kiwi .. mango)

TOTAL calculates the values for all cells in the item TOTAL, no matter how many years you add. If you insert an item in the range kiwi..mango, any new values will be summed in the TOTAL

To create a recurrence formula

	Amount	Balance
Number 0		$5000.00
Number 1	$300.00	$4700.00
Number 2	$200.00	$4500.00
Number 3	$12.25	$4487.75

Check

✓ 1	Balance:Number 0 = 5000
✓ 2	Balance:Check[THIS] = Balance:Check[PREV] - Amount:Check[THIS]

Formula 1 establishes your initial checking balance. Formula 2 is the recurrence formula. When you enter a check, Improv subtracts its amount from the previous balance to arrive at a new balance

1. Create an initial value, such as the beginning balance for a checkbook

   You can enter this value manually or use a formula, as in formula 1 above
2. Double-click a formula line and point to the item for which you want to calculate a series of values, for example, Balance
3. From the formula bar, click the keyword This to define the current cell in the series

   When Improv adds the keyword, it also adds the category name from the opposite axis to define the range, for example, all the Balance cells in the category Check. You can also use a group name to define the range
4. Click the equal sign
5. Complete your calculation using the keywords This, Prev, or Next to define other cells in the series you are calculating

See Also

Formula Basics: to learn how to create and use formulas in Improv

Pointing to create a formula: to create an Improv formula by pointing

To limit the cells that are calculated by a formula, make a refined selection or use the In clause

A refined selection is an item selection that you restrict, using Shift-click, to particular instances of the items. You can limit the scope of a formula by using a refined selection

An In clause formula calculates values for a specific cell, range, item, group, or refined selection. Follow a general formula with an In clause formula to limit the scope of the general formula

Tip **Procedure**

To limit a formula using a refined selection

Tip **Procedure**

A refined selection (click Jan, then Shift-click Le Jardin) restricts the calculation to only these cells. In a formula, the selection would appear as Jan:Le Jardin

To restrict a calculation using an In clause

- Create an In clause formula by pointing to:
  The keyword In on the formula bar
  The specific cells or items you want to calculate

		Jan	Feb
Le Jardin	apples	400	500
	per gross	$2.25	$2.40
	Total	$900.00	$1200.00
Eve's	apples	130	270
	per gross	$2.25	$2.40
	Total	$292.50	$648.00

Store	Produce
✓ 1	per gross = 2.25
✓ 2	Total = apples * per gross
✓ 3	In Feb, per gross = 2.40

For February the cost of apples per gross goes up temporarily. Formula 1 establishes the usual cost. Formula 2 calculates the total cost. The In clause in formula 3 overrides formula 1 for the February cost per gross

Rules for writing In clause formulas

- If you pointed to refine the selection for the In clause, replace the colon (:) with a comma (,) to conform to In clause syntax
- To use an In clause to restrict the scope of a general formula, the In clause must follow the general formula. A higher numbered formula overrides a lower numbered formula

See Also

Creating a formula by pointing: to create formulas by pointing
Selecting items and their cells: to make a refined selection
Formula punctuation: to use Improv formula punctuation correctly

Add comment lines to annotate and enhance the information in the formulas

✓	1	Profit = Revenue - Expenses
	2	//Still waiting on Adam's Q4 numbers

You can add comments to any empty formula line or add a comment at the end of a formula

Because Improv formulas are written using your terminology, you may find that you need to use comment lines only occasionally

Tip **Procedure**

To add a comment line

1. Click an empty formula line in the formula pane
2. Type two slashes at the beginning of the line to indicate that this is a comment. Improv does not attempt to calculate these lines

   Add a comment at the end of a formula using //

See Also

Formula Basics: to learn how to create and use Improv formulas

Improv allows you to create a general formula that repeats its calculation for all the items in a category or group. Whenever you use a **recurrence formula,** you must either enter a value or create a formula that calculates a value for the starting cell in the series

	Amount	Balance
Number 0		$5000.00
Number 1	$300.00	$4700.00
Number 2	$200.00	$4500.00
Number 3	$12.25	$4487.75

Check	
✓ 1	Balance:Number 0 = 5000
✓ 2	Balance:Check[THIS] = Balance:Check[PREV] - Amount:Check[THIS]

Formula 2 calculates a running total for the checkbook

Tip **Procedure**

To create a running total

1. Double-click a blank formula line
2. Point to the item or group you want to calculate as a running total
3. Click the keyword [This] in the formula bar
4. Click the equal sign in the formula bar
5. Click the item or group name again, then click [Prev] in the formula bar
6. Complete the formula and press Enter
7. Create an initial value by manually entering a value or by creating a formula

See Also

Making a formula more general: to learn more about recurrence formulas

Improv in Action, *Checkbook Register* model: for more details on how to create a running total

To link data from one worksheet to another within a model, you use intersheet formulas

Rules for writing intersheet formulas

- the left side of the formula contains a reference to the current worksheet
- the right side of the formula includes references to other worksheets in the current model
- refer to another worksheet by name, followed by a double colon and the name of the cell, range, item, refined item, group, or category in the other sheet

  Arlington:FY1991=Sales::Arlington:RevenueTotal:FY1991
- pointing at data in other worksheets ensures correct punctuation and syntax
- when using an intersheet reference in a function, do not separate the worksheet name from the item names

  Cost of Goods Sold=SUM(Retail::Cost of Goods Sold)

See Also

Formula Basics: to learn how to create and use Improv formulas

Create Worksheet: to add worksheets to an existing model

Select functions: to link data that meet specific criteria

Connecting models or applications using linked formulas (DDE): to share data between Improv models

Improv Handbook, Chapter 8, Writing Formulas: to write intersheet formulas using matching or non-matching categories

Improv in Action: to see a broad range of models using intersheet formulas

To share data between Improv models or between a model and another application, use Dynamic Data Exchange (DDE). For example, you can use data from a 1-2-3 for Windows worksheet in an Improv model

Tip **Procedure**

To link data using DDE

1. Open the application file or the Improv model that contains the data you want to link to the current Improv model. You must save the model or file that contains the data before you create the link
2. Select the data you want to link
3. Copy the data to the clipboard. Keep the server application running
4. Open the Improv model and worksheet in which you want to use the data
5. Select the cells where you want the data to appear
6. Choose Edit Paste Special
7. Click Paste Link

   Improv pastes the data in the destination cells and enters a link formula in the formula pane

To unlink a formula

- click the link indicator to the left of a link formula. You can reestablish the link by clicking the indicator again

To update formula links

- **Automatically:** open both files, the one containing the data and the Improv model containing the formula links. Improv automatically updates the formula links if the links were active when the model was last saved
- **Manually:** click the indicator beside an unlinked formula to update the formula link manually

See Also

Improv Handbook, Chapter 14, Integrating Improv with Other Applications: to learn more about using DDE to link Improv models and to use data from other applications

Improv functions are built-in formulas that perform specific calculations automatically

Accessing the Improv functions

Click the Functions button in the formula bar to display a list of the Improv functions and their syntax. The Functions button is available when you are creating or editing a formula. For details, see Entering functions automatically

Functions syntax

- In the functions list, argument names appear in parentheses separated by commas
- You must enter the type of information required by the argument (see the list below for types)
- Check Help or Appendix A of the Handbook for examples and further function and argument descriptions for specific functions, including optional arguments, which are enclosed in brackets [ ]

Argument types

Improv functions use the following types of arguments:

- Number: a number, the name of a cell that contains a number, or an expression or function that returns a number
- String: text (any sequence of letters, numbers, and symbols) enclosed in double quotes, the name of a cell that contains text, or an expression or function that returns text. You can also use an empty string, which is a set of double quotes with no characters or spaces between them ("")
- Logical: an expression that Improv evaluates as true or false. In Improv, true is represented by 1 and false by 0. A logical argument uses a logical operator (<, >, =, <>, >=, <=, #NOT#, #AND#, and #OR#). You may also use an expression or a function; a number; text; or an item or group name as a logical argument
- Location: the name of a cell, group, or range; or an expression or function that returns the name of an item or group or a range

Add-in functions

Improv provides 55 additional specialized functions, which you must register using a script. For details, see Registering the add-in functions

In Improv, the Select functions perform calculations on values that meet specified criteria

Each Select function varies according to its calculation, but the arguments for the query criteria use similar logic. Select functions have three arguments: Value Range, Search Range, Key Value

1. Specify the item from which you want to select the value (Value Range)
2. Specify the item whose values you match with key values (Search Range)
3. Specify the item with which you match values from the Search Range (Key Value)

Select Functions

- SELECT: returns a value or string that meets specified criteria
- SELECTAVG: averages the values that meet specified criteria
- SELECTCOUNT: counts the nonblank cells that meet specified criteria
- SELECTMAX: finds the largest value that meets specified criteria
- SELECTMIN: finds the smallest value that meets specified criteria
- SELECTSTD: calculates the population standard devaition of the values that meet specified criteria
- SELECTSTDS: calculates the sample standard deviation of the values that meet specified criteria
- SELECTSUM: sums the values that meet specified criteria
- SELECTVAR: calculates the population variance of the values that meet specified criteria
- SELECTVARS: calculates the sample variance of the values that meet specified criteria

See Also

Improv Handbook, *Appendix A, Functions Reference:* for detailed information about the SELECT functions

Improv in Action, *Accounts Receivable* model: to see Select functions in use

Using Improv functions: to learn about accessing the functions (including the add-in functions), and using correct syntax

You can tailor a worksheet to meet your analysis or reporting needs by hiding and showing information and worksheet elements

You can

- hide selected items (Worksheet Hide Items)
- show selected (Worksheet Show Items) or show all (Worksheet Show All) hidden items
- collapse an item group to show only the group name and summary calculation (Worksheet Collapse Group)
- expand a collapsed group to show detail (Worksheet Expand Group)
- hide a column or row (Resizing rows, columns, and more)
- close the formula pane or data pane (Resizing rows, columns, and more)
- hide or show item names, category tiles, markers for page breaks or hidden items, or grid lines (Worksheet Settings: View)

You can create multiple views of a worksheet to save variations of the appearance of data. (Structural changes, such as adding items or formulas, apply to all views.) Changes can affect all views or just the current view

Current view only
Rearranging categories, collapsing groups, and hiding data affect the current view only

All views or current view
Style changes can affect all views or just the current view of a worksheet. Uncheck "Apply styles to all views" on the View page (Worksheet Settings) to restrict style changes to the current view

See Also

- Create View: to create a new view for a worksheet
- Worksheet Settings: View: to apply styles to all views or restrict style changes to the current view
- Resizing rows and columns: to accommodate long item or group names, or large cell values
- Worksheet Style: to change the font style or size, numeric format, alignment, line style, fill pattern, or color of a selection
- Worksheet Hide Items: to hide selected items in the current view
- Worksheet Collapse Group: to display only the group name without the individual group items in the current view
- Rearranging Categories: to change the organization of the items and categories in a model

A view of a worksheet can be customized for use in data entry by hiding calculated cells and by formatting the view for ease of use

Tip **Procedure**

To create a data entry view

1. Select all formulas
2. Choose Worksheet Mark Cells to highlight the calculated cells
   Cells that are not highlighted are cells that have been manually entered
3. Select the marked cells and choose Worksheet Hide Items until only the entered cells remain

See Also

Create View: to create a new view of the current view, which can be customized
Worksheet Style: to change styles of a selection
Worksheet Hide Items: to hide selected items and their cells
Improv in Action: see the *Consolidation and Allocation* model for data entry views

You can assign numeric formats (general, number, date/time, custom) to cells using the status bar or the Style panel (Worksheet Style)

Tip **Procedure**

1. Select the cells you want to format
2. Choose a numeric format from the status bar or the Style panel

   Status bar: Choose one of the numeric formats by clicking the format button (example showing "General" format)

   General and Number: Click any of the options buttons: 2 $, ( ) E+ $

   Date/Time: click the options button to display a list of available Date/Time formats

   Custom: click the options button to display a list of available custom formats

   Style panel: Click the format button to display the Numeric Format dialog box. Choose one of the numeric formats from the list, then choose an available format option

Designing your own format

You can design your own format for Date/Time or Custom. Choose Date/Time or Custom from the Numeric Format dialog box, scroll to the bottom of the options list, and click Edit.... Improv displays the Edit Formats dialog box. Enter a format in New format, and click Add to include the new format in the list

To create a custom number or custom date/time format, you use characters from the Format Description Language (FDL). See the *Handbook,* Appendix D, Creating Custom Formats for details

See Also

Selecting in Improv: to learn more about making selections in Improv

Tip Procedure

Use the Style panel to change color, font, alignment, and format of items, cells, chart, and presentation text

---

Tip Procedure

To change the color, font, alignment, or format of text

1. Select the characters whose style you want to change
2. Choose Worksheet Style to display the Style panel
3. Click the icons to display the choices for color, font, alignment, and format

Tip Procedure

To change fonts and formats using the status bar

The status bar at the bottom of the Improv window is a quick way to change fonts and formats (click here)

1. Select the characters whose font or format you want to change

   Improv displays the font type, font size, and numeric format buttons (the General button in the example above) on the status bar. The font, size, and numeric format for the current selection appear
2. Click a button to display a popup list of available fonts, sizes, and numeric formats
3. Click to select an option from the list

   Your selection takes effect immediately

See Also

Worksheet Style: to display and use the Style panel

Selecting in Improv: to make the appropriate selection

Resizing rows, columns, and more: to change the dimensions of the grid

Worksheet Settings: View: to apply styles to all views or restrict style changes to the current view

Tip **Procedure**

You can control the background colors and fill patterns for items, cells, and presentation objects, such as circles and text blocks

---

Tip **Procedure**

1. Choose Worksheet Style to display the Style panel
2. Select the area or object where you want to change background color or fill patterns
3. Click the rainbow beside the pail to display the color choices. Click to select a color

4. Click the pattern button to display the pattern choices. Click to select a pattern. (To display a pattern, be sure to choose a color other than white. To make an object transparent, choose no fill pattern)

Tip **Procedure**

Step 1 shows the object selected. Step 2 shows the background color applied. Step 3 shows the selected pattern

---

See Also

Create View: to create a new view, which you can format in a different way from other views of the worksheet

Selecting in Improv: to choose the parts of the worksheet or presentation you want to change

Edit Select Item Names: to select item names only, without their accompanying cells

Edit Select Cells Only: to select cells only, without their item names

Worksheet Style: to display the Style panel, which controls colors, fonts, alignment, numeric formats, lines, and fill patterns

Worksheet Settings: to display the Style panel and Settings pages, which control the layout of the current view and various formula options

Procedure

You can control the color, line style, and other options for the lines in worksheets, presentations, and charts

Procedure

1. Choose Worksheet Style to display the Style panel
2. Select the lines you want to change

   The options vary depending on whether you select items, click the select-all box, or select a presentation object
3. Click an icon opposite the pen to display a list of options

   You must first choose a line style to add line color. Style settings that are not available for the selection are grayed out
4. Click an option. The change takes effect immediately

See Also

Create View: to create a new view, which you can format in a different way from other views of the worksheet

Selecting in Improv: to choose exactly what parts of the worksheet or presentation you want to change

Edit Select Item Names: to select item names only, without their accompanying cells

Edit Select Cells Only: to select cells only, without their item names

Worksheet Style: to display the Style panel, which controls colors, fonts, alignment, numeric formats, lines, and fill patterns

Worksheet Settings: to display the Style panel and Settings pages, which control the layout of the current view and various formula options

In Improv, you can resize rows and columns to accommodate long item or group names or large cell values. You can click and drag to resize a single or selected columns and rows

Tip **Procedure**

To resize rows and columns

1. Move the cursor over the line that separates a row or column until the cursor changes from an arrow to a double-headed arrow
2. Click the mouse and drag the row or column line to the width or height you want

To hide rows and columns by resizing

1. Move the cursor over the line that separates a row or column until the cursor changes from an arrow to a double-headed arrow
2. Click the mouse and drag the row or column line until the word Hide appears in the resize indicator

To resize a group

1. Move the cursor over the line separating the group name from the other item names in that category. The cursor changes from an arrow to a double-headed arrow
2. Click the mouse and drag the line to the width or height you want

To resize the formula pane and data pane

1. Move the cursor to the pane divider (the double arrow in the scroll box area)
2. Click the mouse and drag to change the proportions of the data pane and formula pane

To resize the worksheet window

1. Move the cursor to the border or corner of the worksheet window. The cursor changes to a double arrow
2. Click the mouse and drag to change the proportions of the worksheet

See Also

Create View: to create a duplicate view of a worksheet, which you can then rearrange or resize

Worksheet Settings: View: to apply changes in row and column size to all views or the current view only

To control the layout of a printed page, you can specify a variety of settings in Improv

You can

- specify the Windows printing defaults (File Print Setup)
- specify Improv-specific print settings for the current view, presentation, or script (File Page Setup)
- for the current view, specify whether to print data and/or formulas, where to print item names, and how to number pages. You can specify page margins, page orientation, print size, and headers and footers (Specifying worksheet layout)
- for the current view, display or hide item names, markers for hidden items or collapsed groups, or grid lines. You can arrange items in block or outline form (Worksheet Settings: View)
- specify what pages or selection to print, how many copies, and the print quality (File Print)
- for the current presentation or script, determine margins, orientation, and print size (Specifying presentation and script layout)
- for the current presentation or script, specify the number of horizontal or vertical pages to be printed, how the data is laid out to maximize the use of the printed page, and grid display (Presentation Settings: View)

A hotview is a data pane selection displayed in a presentation. Changes in the worksheet data are automatically updated in the hotview

Tip **Procedure**

To update a hotview

1. Double-click the hotview

The worksheet associated with the hotview becomes the active worksheet

2. Modify the worksheet

Any changes made to the worksheet are immediately updated in the hotview

To move or resize a hotview

Click to select a hotview. Selection handles appear around the boundary

To move: click inside the boundaries of the hotview and drag to move it

To resize: click a selection handle and drag it to resize

When resizing a hotview, Shift-click the selection handle to maintain proportions

See Also

Creating a hotview: to create a hotview from a worksheet selection

Modifying objects in a presentation: to make changes to drawn lines and shapes

Adding a picture to a presentation: to move, resize, or modify a picture or bitmap

Working with OLE objects in a presentation: to move, resize, or update OLE objects

You can select one or more objects in a presentation, including text blocks, buttons, shapes, and DDE and OLE objects. Once selected, you can move, resize, group, cut, copy, paste, and modify styles

Tip **Procedure**

1. Click an object to select it
   Selection handles appear around the object
2. Shift-click to add more objects to the selection

See Also

Grouping objects in a presentation: to collect selected objects into a single object in a presentation
Presentation Bring to Front,Send to Back: to control the overlap of objects

You can collect selected objects into a group, which can be moved, copied, or deleted as a single object. A group can be ungrouped when necessary

Allows you to

- maintain the proportion of and spacing between objects as you move them around in the window
- protect complex objects from being altered

Tip **Procedure**

1. Select the objects you want to group
   Click an object (selection handles appear around the object)
2. Shift-click to add more objects to the group
3. Choose Presentation Group

The picture on the left shows the individual objects selected, ready to be grouped. Once the objects are grouped (Presentation Group), there is only one set of selection handles

To ungroup, click to select the group, then choose Presentation Ungroup

See Also

Selecting objects in a presentation: to select objects in a presentation

Presentation Bring to Front/Send to Back: to control the overlap of objects in a presentation

Drawing objects in a presentation: to draw ovals, rectangles, text blocks, and buttons in a presentation

Adding a picture to a presentation: to add and move, resize, or modify a picture or bitmap in a presentation

The drawing tools are used to create shapes and lines, and to add text to a presentation. The lines and shapes can be moved, resized, and edited. Styles, such as color and drop shadows, can be modified

Modifying Draw Objects

Tip **Procedure**

To create a draw object

1. Be sure a presentation is the active window
2. Choose Create Draw and one of the options (Line, Rectangle, Oval, Text Block, Button) or click one of the corresponding icons from the SmartIcons set
3. Move the cursor to the presentation. The cursor changes to a crosshair
4. Click and drag the mouse to create the size and shape object you want

   As you drag the mouse, a solid line appears indicating the shape of the object
5. Release the mouse button when the object is the size you want

   When you release the mouse button, selection handles appear around the object

To draw a circle or square: choose Create Draw Rectangle or Create Draw Oval and hold down the Shift key while dragging

To move an object: click inside the object and drag it to the new position

To resize an object: click a selection handle and drag to change the size of the object. To maintain proportions, Shift-click the selection handle

---

See Also

Selecting objects in a presentation: to select objects

Grouping objects in a presentation: to collect objects into a single object, which can be moved, resized, or deleted

Presentation Bring to Front, Send to Back: to control the overlap of objects in a presentation

Adding a picture to a presentation: to add and modify a picture or bitmap in a presentation; differs from drawing lines and shapes

Creating an object: to access another application from within Improv to create and embed an OLE object; differs from drawing objects

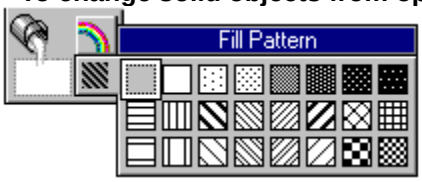
After you have created a line, rectangle, oval, text block, button, or other object, you can resize or reposition the object, and change its color and other attributes

Tip **Procedure**

To modify the appearance of objects

Click to select one object, or Shift-click to select multiple objects. Selection handles appear

To change solid objects from opaque to transparent: choose no fill pattern from the Style panel



To resize: click one of the selection handles around the selected object and drag to the correct size

To reposition: click inside the selected object and drag the selected object to a new location

To change colors and patterns: use the Style panel to change the color and other attributes of the selected objects

See Also

Selecting objects in a presentation: to select objects in a presentation

Grouping objects in a presentation:: to collect objects into a single object which can be moved, resized, or deleted

Presentation Bring to Front/Send to Back: to control the overlap of objects

Presentation Style: to change the color, border, text, and fill characteristics of objects in a presentation

Adding a picture to a presentation: to modify a pasted picture or bitmap

Working with OLE objects in a presentation: to update OLE objects

Working with a hotview: to update a hotview

You can automate a presentation by adding a button that activates a script. Like other objects, a button can be moved, resized, edited, and the styles, such as color and line, can be modified

Tip **Procedure**

1. Make a presentation the active window
2. Choose Create Draw Button

   The cursor changes to a crosshair
3. Click and drag to create the button

   A button appears with the default text Button, and Improv displays the Attach Script dialog box
4. Select the file and the script you want to run. You can also type the full path and file name of a script library file (.LSS)
5. Check the box for Attach to selected graphic
6. Click OK

See Also

Drawing objects in a presentation: to draw ovals, rectangles, text blocks, and buttons

Modifying objects in a presentation: to make changes to a button

To add a picture or bitmap to a presentation, use Edit Paste Special. You can move, resize, or modify a selected picture or bitmap to suit your needs

Tip **Procedure**

To modify a picture or bitmap

Click to select a picture or bitmap. Selection handles appear around the boundary

To move: click within the selected box

To resize: click a selection handle and drag to the size you want. To maintain proportions, use Shift-click while dragging

Note: a picture with text will resize better than a bitmap with text

To modify styles

Bitmap: modify line style, line color, shadow

Picture: modify line style, line color, shadow, color, background

1. Click to select a picture or bitmap
2. Choose Worksheet Settings to display the Style panel
3. Choose a line option (pen) or fill option (pail)

   The selected option takes effect immediately

See Also

Using Paste Special in a Presentation: to paste a picture or bitmap into a presentation

Drawing objects in a presentation: to draw ovals, rectangles, text blocks, and buttons in a presentation; differs from pasting a picture or bitmap

Creating an object: to access another application from within Improv to create and embed an OLE object

Linking or embedding objects in a presentation (OLE): to link or embed objects from other applications; differs from pasting a picture or bitmap

Creating a hotview: to link data from a worksheet selection to a presentation

Grouping objects in a presentation: to collect objects into a single object which can be moved, resized, or deleted

Presentation Bring to Front, Send to Back: to control the overlap of objects

Improv Handbook, Chapter 14: for examples of using linked and embedded objects in Improv

You can use Object Linking and Embedding (OLE) to display data from other applications in an Improv presentation. The original data, whether a graphic or a part of a spreadsheet, becomes an object in the presentation

Linking

A linked object contains a reference to the data, which resides in a separate file created in the server application. Linking data makes better use of system resources than embedding does, because the data is contained in a single file

Embedding

An embedded object, created by another application, resides in Improv, the client application. Embedding data is useful when you want to control access to the data or to keep all the data in a single Improv file. When you use the Create Object command, you create an embedded object

Tip **Procedure**

To link an object

1. Open the application file that contains the data you want to link. You must save the file that contains the data before you use it
2. Copy the data you want to link to the clipboard. Keep the server application running
3. Open the Improv model and presentation in which you want to display the linked object
4. Choose Edit Paste Special
5. Click Paste

   Improv displays the linked object. You can close the server application

To embed an object

1. Open the application file that contains the data you want to embed
2. Copy the data you want to embed to the clipboard. Keep the server application running
3. Open the Improv model and presentation in which you want to display the embedded object
4. Choose Edit Paste Special
5. Select the object name from the Data Type box
6. Click Paste

   Improv displays the embedded object. You can close the server application

To create and embed a new object

1. Open the Improv model and presentation in which you want to embed an object
2. Choose Create Object
3. Select the application you want to use from the Object Type list and click OK
4. Create an object
5. Choose File Update or follow the server application's instructions to update the embedded object

   Improv displays the embedded object. You can close the server application

See Also

Working with OLE objects in a presentation: to edit linked or embedded objects in a presentation

Creating an object: to access another application from within Improv to create and embed an OLE object

Adding a picture to a presentation: to add a picture or bitmap using Edit Paste Special; differs from linking or embedding objects

Creating a hotview: to link data from a worksheet to a presentation

Improv Handbook, Chapter 14, Integrating Improv with Other Applications: to learn more about using OLE to link or embed objects in presentations

To edit the actual data in a linked or embedded object, you must use the server application

Linked object

To edit a linked object, you must have access to the server application and the server file containing the linked data

Embedded object

To access the data in embedded objects, you must open the server application from the client application

Tip **Procedure**

To edit a linked or embedded object in an Improv presentation

1. Do one of the following:
   - Double-click the object in the Improv presentation

     If double-clicking performs an action other than initiating edit mode, press the right mouse button and choose Edit Object from the quick menu
   - Select the object in the Improv presentation and then press Enter. If the object has a script attached to it, you must ctrl-click the object to select it

     The server application launches
2. Make the desired changes
3. Choose File Update, or follow the server's instructions to save the changes.
4. Choose File Exit to exit the server and return to Improv

See Also

Linking or embedding objects in a presentation (OLE): to link or embed OLE objects

Modifying objects in a presentation: to make changes to lines and shapes drawn in a presentation

Working with a hotview: to update or modify worksheet data in a presentation

Adding a picture to a presentation: to modify or resize a pasted picture or bitmap

Improv provides Quick Menus at the click of the right mouse button. With Quick Menus, your choices for any selection are immediately displayed and available for use. The menu choices in a Quick menu depend on the current selection

Tip **Procedure**

For SmartIcons

1. Move the cursor over one of the SmartIcons
2. Click the right mouse button

   Improv displays the command executed by the selected icon

For the worksheet

1. Make a selection in the data or formula pane
2. Click the right mouse button

   Improv displays a menu of the commands available for the selection

See Also

Tools SmartIcons: to customize a set of SmartIcons for your use

Tip Procedure

A template is a convenient starting point for creating a new model

Allows you to

- simplify building a model by starting with a template. A custom template can include one or more worksheets, views, scripts, and presentations. If you save a file and specify it as the startup file (Tools User Setup: Paths), the file is automatically opened each time you choose File New

Tip Procedure

To create a template

1. Build an Improv model containing one or more worksheets and views, presentations, and scripts
   You can add fixed data or formulas if they will be used in all instances of the template
2. Save the model in a file
   The new file has the default name Untitled
3. Choose Tools User Setup to display the User Setup dialog box
4. Click the Paths button to display the Default Paths dialog box
5. Type the path and complete file name, including the .imp extension, in the Startup model text box
   Improv uses this file every time you start a new Improv session or choose File New. The new file has the default name Untitled
6. Click OK to accept the changes in the Paths dialog box
7. Click OK to save the changes in the User Setup dialog box

To use a template

1. Choose File Open
2. Add data or other information to the model
3. Choose File Save As and create a copy of the template with a new name. You must save the new model separately from the original template or you will update the template with your work

See Also

Creating a suite of templates: to develop a suite of templates for custom model building
Create Worksheet: to add a new worksheet to an existing model
File New: to create a new model which can contain one or more worksheets, views, presentations, and scripts
Create View: to create a new view of the current worksheet
Create Presentation: to create a new presentation window

You can develop a suite of templates that make it easy for others to create worksheets and models that follow the company's guidelines. This makes it easier to share information among multiple users who are using variations of a model

Tip **Procedure**

Improv provides worksheet templates for you to use as a starting point for creating your own models. The Load Template icon displays a dialog box that lets you select a template. To add the icon to your SmartIcons set, see Adding and deleting SmartIcons

---

Tip **Procedure**

To create a suite of templates

1. Choose File New to create the first worksheet of a new model
2. Add the items and categories you want to include as part of the template. You can also add fixed data or formulas if they will be used in all instances of the template
   Choose Create Worksheet if you want to add more worksheets to the template model
   Choose Create View if you want to include more views in the template
   Choose Worksheet Style to format
   Choose Create Presentation if you want to include a presentation for the template
   Choose Create Script if you want to include a script in the template
3. Choose File Save to name and save the model template in a file
   You can create a separate directory for saving all the template files

To use a template

1. Choose File Open
2. Choose the template file you want to use from the appropriate directory and click OK
   Improv displays the model, including all the worksheets, views, and presentation windows that were created as part of the template
3. Choose File Save As and create a copy of the template with a new name. You must save the new model separately from the original template or you will update the template with your work

---

See Also

Worksheet Style: to modify the appearance of text and characters in the worksheet

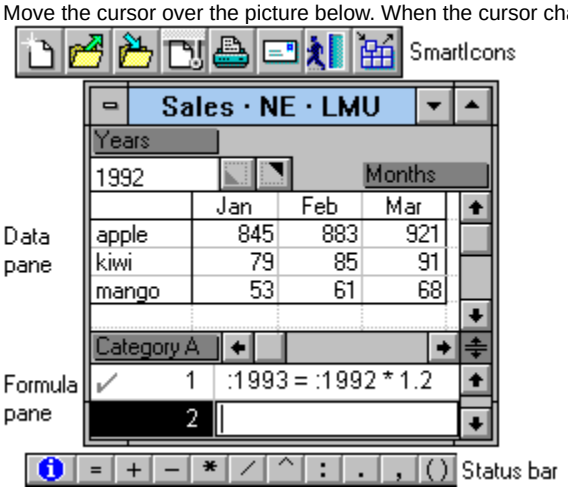
Welcome to Improv! To learn about working in Improv, click a green, underlined topic below, or click the Browse button (>>) above to move through this chapter

If you want to retrace your steps when using Help, click the Back button above

The basic unit of an Improv model is a worksheet, which is made up of

- a data pane for displaying data and cells
- a formula pane for creating formulas

Move the cursor over the picture below. When the cursor changes to a hand, click the mouse to pop up a description



Next page: Building a worksheet

Click the Back button above to retrace your steps

You add items to build a worksheet and name them to represent your information

Tip **Procedure**

A worksheet starts with two items, each with a default name. The two items intersect to form a single cell

	Jan	Feb
kiwi	123	150
mango	84	90
papaya	55	61
Total	262	301

Adding and naming items builds your worksheet. The item kiwi includes the cell values 123 and 150. The item Jan includes the cell values 123, 84, 55, and 262. The items kiwi and Jan intersect to form the cell named kiwi:Jan

Next page: Writing formulas

Click the Back button above to retrace your steps

Improv formulas are general. A single formula can calculate the values for many cells

Tip **Procedure**

One formula calculates the values for the highlighted cells. You write formulas in words, using item names

Introducing Improv formulas:

- You create formulas in the formula pane, where they remain visible. You don't enter formulas in cells
- Each formula appears in a separate, numbered formula line
- Improv formulas use item names, making the formulas easy to read and understand
- You can efficiently and accurately create formulas by pointing to item names, cells, and categories
- You don't copy formulas from cell to cell

Next page: Selecting in Improv

Click the Back button above to retrace your steps

In Improv, you always select first, then use a command or one of the SmartIcons to perform an operation. To select something, click it. Improv highlights the selection

Tip **Procedure**

Click an item name to select the item. The item name (Feb) and its cells are highlighted, indicating that they are all selected

Tip **Procedure**

Click a category tile (Months) to select the category and its items (Jan, Feb, Mar)

Tip **Procedure**

Click a formula line in the formula pane to select it

Next page: Editing your work
Click the Back button above to retrace your steps

You can replace or modify values in cells, edit formulas, change item and category names, and change text in charts and presentations

Tip **Procedure**

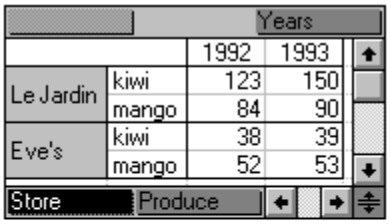
To replace data, click and type a new entry. Category C is selected, ready for you to type the name Year

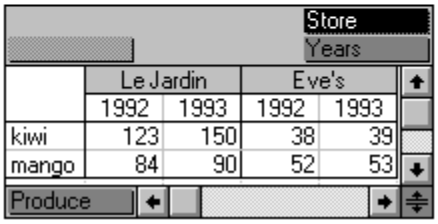
Tip **Procedure**

To modify data, double-click and edit the existing entry. In edit mode, Months has been changed to Month

Next page: Viewing data in different ways
Click the Back button above to retrace your steps

In Improv you can easily view your data in different ways. A category tile is a handle that lets you move an entire category of items and associated cells to a new position in a worksheet





Click the category tile Store and drag it to a new category area. All the Store items (Le Jardin and Eve's) and their associated cells move also. The same information appears in a new arrangement

Next page: Expanding a worksheet

Click the Back button above to retrace your steps

Both categories and groups allow your worksheet to accommodate more and different kinds of information

Add a group to capture detail and summary information

Tip Procedure

Create a group (Fruits) to collect related items. If you include a summary item (Total) in a group, you can collapse the group to display only Total, the group calculation

Add a category to expand the scope of your worksheet

Tip Procedure

Use the worksheet for next year as well as this year. Add a category, Category C, to handle years. Add items to this new category to handle specific years (1992, 1993). Your formulas already apply to the added year

Next page: Correcting mistakes

Click the Back button above to retrace your steps

Finding the best approach to fitting your information into an Improv model can involve some trial-and-error. If your model doesn't look or work the way you want, you can easily make changes to it

To correct mistakes or alter a model, you can

- undo the last operation (Edit Undo)
- redo what you just undid (Edit Redo)
- move categories to reorder your data
- group or ungroup items to show detail or summary
- hide selected extraneous information (Worksheet Hide/Show Items)
- cut, copy, and paste information (Edit Cut, Edit Copy, Edit Paste)
- delete elements you don't need (Edit Delete)
- start fresh with a new file (File New) or a new worksheet (Create Worksheet)

Next page: Saving your work

Click the Back button above to retrace your steps

In Improv, one file contains all the parts of a model: worksheets and views, presentations with charts, scripts

You can:

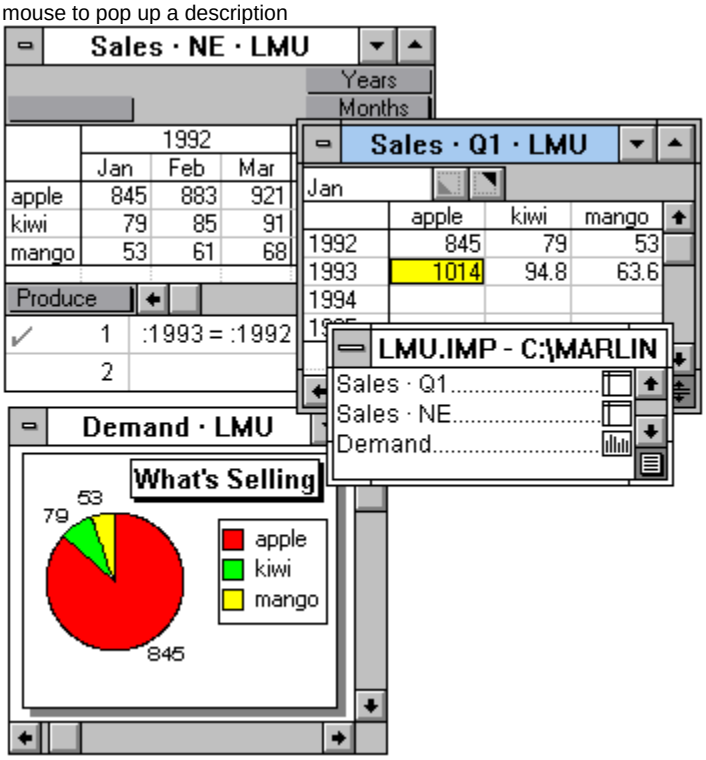
- save a new file (File Save)
- save changes to a previously saved file (File Save)
- discard changes made since the last save (File Revert to Saved)
- save an existing file under a new name (File Save As)
- export files to different file formats (File Save As, then Export Worksheet or Export Text)

Next page: The Big Picture

Click the Back button above to retrace your steps

An Improv model contains one or more worksheets and views, presentations with charts, and scripts saved together in one file. You can add, copy, open, name, and delete worksheets, views, presentations, and scripts from the Browser (Window Browser)

To learn about the different parts of a model, move the cursor over the picture below. When the cursor changes to a hand, click the mouse to pop up a description



Next page: The Basic Rules
Click the Back button above to retrace your steps

The basics of navigating, selecting, adding and deleting, editing, and managing models in Improv

Navigating

To move between the data pane and the formula pane in a worksheet

- Move the cursor to the data pane or formula pane and click

To move among the worksheet, presentation, and script windows

- Click any part of a visible window to make it the active window
- Choose Window Browser to display the Browser. Click a view, presentation, or script icon to make it the active window. Double-click to open a closed element of the model

Selecting

Always select first, then perform a command or operation

- To select an element, click
- To select multiple elements, click and drag
- To select an element for editing, double-click

Adding and deleting

To create a new item, category, or formula

- Click to select an existing object of the same kind and press the Enter key

To delete an item and its cells, a cell value, or a formula

- Click to select what you want to delete and press the Delete key

To delete several items and cells, cell values, or formulas

- Click and drag to select several contiguous elements and press the Delete key

Editing

To edit text

- To replace text, select an item, category, cell, or formula line and start typing. The old entry disappears as you type
- To selectively edit, double-click an item, category, formula, or cell and move the cursor where you want to add or delete characters (example)

Managing models

To open and close files

- Choose File Open to open an existing Improv file. Choose File Close to close a file

To manage the contents of an Improv model

- Choose Window Browser to display the Browser. This is where you add, copy, open, name, and delete the parts of the current model (worksheets, views, presentation windows, script windows)

See Also

Formulas Basics: for an introduction to writing Improv formulas

How Do I?: for common tasks you perform in Improv

Improv Help Contents: for the Improv Help table of contents

Improv Tour: for an animated demonstration of basic Improv concepts

Start Here: Exploring Improv: for a printed tutorial which steps you through building a simple Improv model

Improv Handbook: for a comprehensive guide to using Improv

For a look at the distinctions between Improv and conventional spreadsheets, click a green, underlined topic below, or click the Browse button (>>) above to move through this chapter

If you want to retrace your steps when using Help, click the Back button above

Improv is a fresh approach to spreadsheets that lets you concentrate on your data rather than on spreadsheet mechanics

---

The information below is the same, but the look is different

In Improv:

Tip **Procedure**

In conventional spreadsheets:

A	A	B	C	D
1				
2			1991	1992
3		kiwi	800	1000
4		mango	1000	2000
5		TOTAL	1800	3000
			+C3+C4	+D3+D4

Next page: What makes Improv different

To start working in Improv, you need to understand a few new concepts and how to apply them

Items define cells

Improv makes item names an integral part of the worksheet. Two items intersect to form and name a cell

Tip **Procedure**

The item named Total includes the cells named Jan:Total and Feb:Total

Formulas use your language

You select the item names that you want to include in a formula. One formula can calculate many cells. Improv formulas are written, edited, and displayed in a separate formula pane

Tip **Procedure**

Formula 1 is calculating the projected sales for all the produce items in 1993 based on the 1992 sales. As you add stores or types of fruit, the formula automatically calculates the values for the additional items

Selecting comes first

In Improv, you select first, then execute a command or use one of the SmartIcons. Often, what you select determines what options are available

Next page: Think items, not cells

In Improv, item names and cells form a partnership. Cells display data; item names give cells meaning

In Improv:

- An item's name is not separate from its data

Tip **Procedure**

The cell named Total:Jan contains the value 262. If you change Total to Sum, the cell name and any formula associated with the name changes to Sum:Jan

In conventional spreadsheets:

- You create the labels 1992 and kiwi to identify the data that is in cell D3. Labels are a convenience, but the cell name (D3) has no relationship to kiwi (B3)

A	A	B	C	D
1				
2			1991	1992
3		kiwi	800	1000
4		mango	1000	2000
5		TOTAL	1800	3000

Next page: "Let's see that another way"

In Improv, items are organized by categories. You can move a category and reposition all its items and associated cells. You can easily look at your data in different ways, broaden your analysis, and gain new insights about your data

In Improv:

		Years	
		1992	1993
Le Jardin	kiwi	123	150
	mango	84	90
Eve's	kiwi	38	39
	mango	52	53

Store | Produce

	Store			
	Years			
	Le Jardin		Eve's	
	1992	1993	1992	1993
kiwi	123	150	38	39
mango	84	90	52	53

Produce

By clicking the category tile Store and dragging it to a new category area, you instantly get another slant on your data

In conventional spreadsheets:

A	A	B	C	D
1				
2			1991	1992
3		kiwi	800	1000
4		mango	1000	2000
5		TOTAL	1800	3000

Rows and columns are in a fixed position. To see the labels, cells, and calculated values in another way requires rebuilding the spreadsheet

Next page: Grabbing what you need

Selecting the information you need to work with is important. In Improv, you select first, then choose a menu command, keyboard equivalent, or one of the SmartIcons to execute the command for the selection

In Improv:

Tip **Procedure**

The most useful selection in Improv is clicking an item name, which selects the item and its cells. Formulas make powerful use of item selections. You can refer to an item name in a formula and calculate the values for all its cells

Tip **Procedure**

Click and drag to select cells

Next page: Copy may surprise you

You can copy almost anything, but be aware of some surprises

In Improv:

- You cannot copy formulas from one cell to another because formulas are not located in cells. They are written and displayed in a separate formula pane
- When you copy a cell, you copy only its contents
- When you copy an item, then paste it, Improv changes the pasted item name to a default name to differentiate it from the original
- One general formula calculates the values for multiple cells, eliminating the need to copy the formulas from cell to cell

Next page: One formula says it all

General formulas allow you to calculate values for multiple cells, which means fewer formulas

In Improv:

Item names are an integral part of the formula

Tip **Procedure**

Formulas are written, edited, and displayed in a separate formula pane. This formula calculates the TOTAL produce sold for each year. Notice the values for 1993 and 1994 are not yet available, but the formula already applies to those years

In conventional spreadsheets:

Tip **Procedure**

Formulas are cell-based; the labels have nothing to do with the formula calculation

Next page: Grouping information into subsets

Item groups enable you to create subsets of items, include summary calculations, and add detail to a worksheet

In Improv:

Tip **Procedure**

Items are grouped by Fruits and Vegetables. Each has a group Total. The group Vegetables is collapsed to show only the Total

- Visually grouping information that's related can make a worksheet easier to understand
- Groups allow you to break out data for which you want a subtotal, average, or other automatic summary calculation
- Group summaries are automatically updated when items are added to a group
- You can collapse a group to show only the group summary

Next page: Rebuild a worksheet? No way

You don't have to rebuild a worksheet. When you need to expand your model, you can simply add to the worksheet. General formulas apply to the new items and categories that you add. You can rearrange categories to look at the data in different ways

In Improv:

- It's easy to extend a worksheet by adding a new category and more items

Tip **Procedure**

Two categories (Produce, Months) handle the information for this year

Tip **Procedure**

To reuse your model for years to come, add a new category (Category C) and name it Years. Each item in the new category will represent one year

- Don't rebuild the worksheet if the data is in the wrong orientation. Simply click a category tile and drag it to another category area. The items move to a new location and give you a different look at the data

In conventional spreadsheets:

A	A	B	C	D
1				
2			1991	1992
3		kiwi	800	1000
4		mango	1000	2000
5		TOTAL	1800	3000

Making an organizational change to the spreadsheet involves extensive retyping and recalculating, which could easily introduce errors into the model

Next page: 1-2-3 Task Equivalents

In 1-2-3	In Improv
Copying a formula to another cell	You don't copy cell-based formulas, you write general formulas. See Formula Basics
Moving items and cells	Edit Cut to cut selected items and their cells to the clipboard. You cannot cut cells without cutting an entire item, but you can cut cell values
	Edit Paste and Edit Paste Special to paste items and cells, or to paste cell values at the selected location
Using @ functions	Improv Functions
Moving from 1-2-3 to Improv	1-2-3 command equivalents Improv Basics for New Users
Calculating cell values	Formula Basics
Using relative cell addresses	You don't use cell addresses; you use item names. See Building a Worksheet
Using labels	You don't use labels; you name items. See Improv Basics

Next page: 1-2-3 Command Equivalents

/Data Fill	Worksheet Data Fill
/Data Query	Select functions
/Data Sort	Worksheet Sort Items
/File Combine	Edit Cut
	Edit Paste
	File Open
/File Import	Importing a worksheet
/File List	Window Browser
/File New	File New
/File Open	File Open
/File Retrieve	File Open
/File Save	File Save
/File Xtract	Edit Cut
	File Close
/Graph	Create Chart
/Print	File Print
/Quit	File Exit
/Range Format	Worksheet Style
/Range Label	Worksheet Style
/Range Name	Improv Basics
/Range Transpose	Rearranging Categories
/Worksheet Column	Resizing Rows and Columns
/Worksheet Delete	Window Browser
/Worksheet Global	Tools User Setup
/Worksheet Hide	Worksheet Hide Items
/Worksheet Insert	Edit Add Item
	Create Worksheet
/Worksheet Status	Tools User Setup

Next page: Where to go from here

You've seen some of the major differences between Improv and conventional spreadsheets. Here are suggestions on where to go from here

---

Improv Basics for New Users: for a quick look at the fundamentals of Improv

Formula Basics: for more on Improv formulas

How Do I?: for a list of Improv tasks

Improv Tour: for an animated look at Improv features and functionality

Start Here: Exploring Improv: for a step-by-step print tutorial that teaches you the basics of using Improv

Improv Handbook: for a comprehensive guide to using Improv

To learn about using Improv formulas, click a green, underlined topic below. Click the browse button above (>>) to move through this chapter

If you want to retrace your steps when using Help, click the Back button above

Improv formulas are different from those of conventional spreadsheets (example)

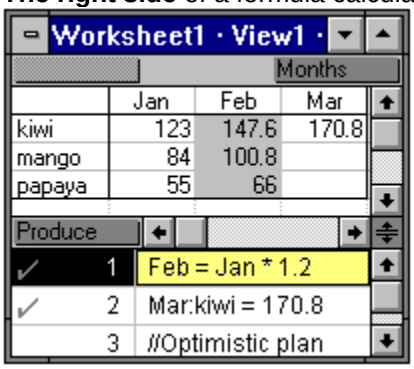
- Each formula appears in a separate formula line in the formula pane, where all formulas are visible. Don't look for formulas in the cells
- The left side of the formula indicates which cells are to be calculated. The right side describes how the values are calculated
- One formula can calculate many cells; you don't copy formulas from cell to cell
- When formulas attempt to calculate the same cell (formula overlap), the highest numbered formula takes precedence
- The formulas appear in the formula pane. The values appear in the cells
- Item names rather than cell addresses are used in formulas

See Also

Parts of a formula

A formula has two sides separated by an equal sign:
Feb = Jan * 1.2

The left side of a formula specifies the cell or cells whose values you want to calculate. The calculated values appear in these cells
The right side of a formula calculates the values for the cells you specify on the left hand side



The general formula (1) is calculating values for all produce sold in Feb, based on Jan sales. The cells calculated by this formula are highlighted
The cell-specific formula (2) enters the value 70.8 in the cell formed by the intersection of kiwi and Mar

See Also

Pointing to create a formula

Selecting in Improv: to select the items and cells whose values you want to calculate or use in calculations

Create formulas by pointing to items, cells, and categories in the data pane and to elements on the formula bar. Pointing avoids typing errors

Tip **Procedure**

1. Double-click a blank formula line in the formula pane. Improv highlights the formula line
2. Move the cursor to the data pane. Click the item, cell or categories (or click and drag to select a range of items or cells) for which you want to calculate values

Tip **Procedure**

When you move the cursor to the data pane, the cursor changes to a crosshair. As you click in the data pane, Improv automatically displays the name of the items, cells, or categories

3. Move the cursor to the formula bar and click the equal sign

4. Create the right side of the formula by pointing to the items, cells, or categories and by typing in other data

   You can point to and click items, cells, and categories in the data pane of the current worksheet or in another worksheet in the model

5. Click to the left of the formula number (or press Enter) when you complete the formula

   Improv calculates the values if the syntax is correct. If there are errors or the formula needs more attention, error messages and status indicators in the formula line provide more information

See Also

Formula bar

Formula status indicators: to identify a formula's status

Other status indicators: to monitor the worksheet and model for formula errors, recalculation, and circular references

Connecting worksheets using formulas: to collect and link data among many worksheets

Improv displays the formula bar when you are editing a formula. The formula bar appears in the status bar at the bottom of the Improv window

=	Equal
+	Add
-	Subtract
*****	Multiply
/	Divide
^	Exponent
:	Item name separator (colon)
.	Group name separator (period)
,	Comma
( )	Parentheses
Functions	Displays a list of Improv functions
In	Restricts the scope of a formula
This	Cell value that Improv is currently calculating. Used in recurrence formulas
Next	Cell value after the value named by This in the group or category. Used in recurrence formulas
Prev	Cell value before the value named by This in the group or category. Used in recurrence formulas

See Also

Formula status indicators

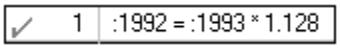
Other status indicators: to monitor the worksheet and model for formula errors, recalculation, and circular references

Formula punctuation: to use the correct punctuation in a formula

Improv Handbook, Chapter 8, Writing Formulas

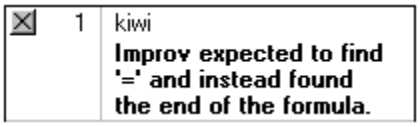
Formula status indicators appear to the left of a formula number in a formula line

Checked Indicator:



Formula syntax has no errors. Formula calculates and displays values for the specified cells

Error Indicator:



Formula contains an error. Click the X for detailed information about the error. A vertical bar marks the position of syntax errors

Overlap Indicator:

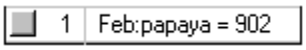
Tip Procedure

Appears in the status bar when formulas overlap in trying to calculate the same cells. Click the overlap button to display the list of overlapping formulas

Tip Procedure

The highest number formula calculates the overlapped cells. To change the formula priority, click and drag the slider and move the formula to another position in the list

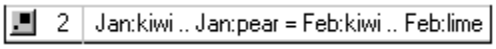
Unchecked Indicator:



Formula has not been checked for correct syntax and therefore is not calculating values. To check, click the box, or press Ctrl+K

To automatically check formulas when they are created, check the setting for Auto-check formulas in the Options page (Worksheet Settings)

Mismatch Indicator:



Formula checks with a warning. The number of cells named on one side of the formula does not match the cell selection named on the other side. Click the indicator for explanation

Commented Formula:

Tip Procedure

Formula is not checked or calculating values. Comments are useful to document a formula or a group of formulas

See Also

Other status indicators

Three indicators appear on the status bar

Circular reference indicator: appears when the value in a cell depends either directly or indirectly on itself. The cell may be calculated by one or more formulas

Calc button: dimmed when all values calculated by formulas are updated

Automatic recalculation: you can set formulas to recalculate automatically from the Recalc settings page (Worksheet Settings)

Manual recalculation: when Recalculate is set to Manually and cell values are updated, the word "Calc" reminds you to click the Calc button to recalculate the values

Attention indicator: indicates that one or more formulas contains an error

See Also

Formula punctuation

Formula status indicators: to see which formulas are checked and calculating, or which formulas contain errors or warnings

- A colon (:) in a cell name separates the items from different categories, for example *Sales:FY1991:Le Jardin*
- A period (.) separates a group name and an item name that follows, for example, *Fruits.kiwi*
- A range is represented by the first and the last elements of the range, separated by two periods (..), for example *Jan..Feb*
- Square brackets ([ ]) are used for index notation and in recurrence formulas, for example [Prev]
- Item names can not include colons, tabs, and returns
- Two slashes (//) indicate a comment, which you can use to document your formulas
- Intersheet references are represented by separating the worksheet name from the category and item names with two colons (::), for example *Tax Rate::1990:Federal*

See Also

Rules for formulas

Improv Handbook, Chapter 8, Writing Formulas

The following rules apply when you are typing or editing a formula. If you create a formula by pointing, Improv supplies the correct form

Item Names

- Improv ignores capitalization and extra spaces

Group Names

- If you include a group name as part of an item name in a formula, enter the name of the group first. For example, Costs.Salaries is different from Salaries.Costs

Numbers

- If a name begins with or consists entirely of numbers, precede the name with a colon when you enter it in a formula. For example, enter the item name 1991 as :1991

Names with Arithmetic Operators

- If a name contains an arithmetic operator, such as + or /, enclose the name in single quotes when you use it in a formula. For example, enter the name Cost + Salaries + Benefits as 'Cost + Salaries + Benefits'

See Also

Formula status indicators: to identify which formulas are syntactically correct and are calculating values, and which formulas need correction or attention

Other status indicators: to monitor the worksheet and model for formula errors, recalculation, and circular references

Pointing to create a formula: to create formulas by pointing to the data pane and using the formula bar

Improv Handbook, Chapter 8, Writing Formulas

This is a quick reference to the Improv functions. Function information is also available in the *Improv Handbook,* Appendix A, Functions Reference

A summary of function types and their uses

Calendar	Calculate values that represent dates and times
Financial	Analyze investments and annuities, determine depreciation, calculate cash flows and loans
Group	Perform statistical calculations on values in groups and in ranges
Logical	Calculate based on conditions that are either true or false
Mathematical	Calculate values using trigonometry, logarithms, and numeric operations
Select	Perform statistical calculations on values that meet specified criteria
Special	Provide information about the contents of a worksheet
Statistical	Perform statistical calculations on values
String	Evaluate and manipulate text

See Also

Entering functions automatically: to learn how to use the Functions button on the formula bar

Registering the add-in functions: to run the script that registers the additional functions

You can manually type functions and their arguments, or you can use the Functions button on the formula bar to automatically enter a function. Its argument placeholders and separators appear in the formula pane

To use the Functions button to enter a function:

1. Enter the left side of the formula followed by an equal sign (=)
2. Click the Functions button on the formula bar
3. Do one of the following:
   Scroll to the function you want to use, and then double-click the function name

   Type the first letter or letters of the function you want to use, and then double-click the function name

   Improv automatically enters the function name, argument placeholders, and argument separators in the formula pane
4. Replace the arguments placeholders with the appropriate argument or arguments. Double-click to select an argument, and then either type the appropriate argument or point in the data pane to replace the argument with the appropriate selection

Improv comes with a script library file named ADDINS20.LSS that contains the script you use to register the add-in functions. The add-in functions are stored in a file named ADDINS20.DLL

At the beginning of a work session in which you want to use the add-in functions, you must run the script named Load @Functions, which is in the script library file named ADDINS20.LSS. Running this script registers the functions. If you don't run the script, the functions will not be available. To ensure that the add-in functions are always available, add the Load @Functions icon to your SmartIcons set, or attach the script to a model that you specify as the Startup model

Tip **Procedure**

To register the add-in functions using SmartIcons

1. Add the Load @Functions icon to your SmartIcons set (Adding and deleting in a SmartIcons set)
2. Click the icon to register the add-in functions

To register the add-in functions

1. Choose Tools Run Script to display the Run Script dialog box
2. In the File Name list, select the file named ADDINS20.LSS
3. In the Script Name list, select the script named Load @Functions
4. Click OK to run the script
   Improv registers the add-in functions

If you mistakenly destroy the script library file that registers the add-in functions, you can easily recreate it. The file ADDINS20.LSS contains two scripts that register the add-in functions. See Appendix A of the *Handbook* for detailed instructions on recreating the script

Use this table of functions to quickly look up the uses of Calendar functions. The functions whose names are followed by an asterisk (*) are add-in functions that you must register before you can use them (see Registering the add-in functions)

For calculating with dates

D360: calculates the number of days between two date numbers, based on a 360-day year
DATE: calculates the date number for specified year, month, and day values
DATEDIF* calculates the number of years, months, or days between two date numbers
DATEINFO* returns information about a date number
DATEVALUE: converts text that looks like a date into a date number
DAY: calculates the day of the month in a date number
MONTH: calculates the month in a date number
WEEKDAY* calculates the day of the week in a date number
WORKDAY* calculates the date the specified number of days before or after a specified date, excluding weekends and holidays
YEAR: calculates the year in a date number

For calculating with times

HOUR: calculates the hour in a time number

MINUTE: calculates the minutes in a time number

SECOND: calculates the seconds in a time number

TIME: calculates the time number for specified hour, minute, and second values

TIMEVALUE: converts text that looks like a time into a time number

For calculating the current date and time

NOW: calculates the date and time number that corresponds to the current date and time set on your computer

TODAY: calculates the date number that corresponds to the current date set on your computer

D360(*start-date-number*,*end-date-number*)

Calculates the number of days between two date numbers, based on a 360-day year

Arguments: *start-date-number* and *end-date-number* are date numbers. Usually another date function supplies the date numbers

Examples:

Cell = D360(DATE(89,4,16),DATE(89,9,25)) returns 159, the number of days between April 16, 1989 and September 25, 1989

Related functions: DATEDIF calculates the number of years, months, or days between two date numbers. WORKDAY calculates the date the specified number of days before or after a specified date, excluding weekends and holidays

DATE(*year,month,day*)

Calculates the date number for specified *year*, *month*, and *day* values

Use DATE to create date numbers that you can sort and/or use in calculations

Arguments:

year is an integer from 0 (the year 1900) to 199 (the year 2099), inclusive. Alternatively, *year* is an actual year number from 1900 to 2099, inclusive

month is an integer from 1 to 12, inclusive

day is an integer from 1 to 31, inclusive. The value you use for *day* must be a valid day for the *month*; for example, you cannot use 31 as the *day* if you use 4 (April) as the *month*

Notes: The result of DATE doesn't look like a date until you assign a date format to the cell

Examples:

Cell =DATE(91,6,3) returns 33392, the date number for June 3, 1991

Related functions: DATEVALUE converts text that looks like a date into a date number. TIME calculates the time number for specified hour, minute, and second values. NOW calculates the date and time number that corresponds to the current date and time set on your computer

DATEDIF (*start-date,end-date,format*)

Calculates the number of years, months, or days between two date numbers. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

start-date and *end-date* are date numbers. Usually another date function supplies the date numbers

format specifies the format you want the result of DATEDIF to appear in. *format* is a code from this table, entered in double quotes:

y	Years
m	Months
d	Days
md	Days, ignoring months and years
ym	Months, ignoring years
yd	Days, ignoring years

Examples: The following examples use the dates February 15, 1990, and September 15, 1993:

Cell=DATEDIF(DATE(90,2,15),DATE(93,9,15),"m") returns 43, the number of months between Februrary 15, 1990, and September 15, 1993

Cell=DATEDIF(DATE(90,2,15),DATE(93,9,15),"md") returns 0, because the day of the month for both *start-date* and *end-date* is the 15th

Cell=DATEDIF(DATE(90,2,15,)DATE(93,9,15),"ym") returns 7, the number of months between February and September

Related functions: D360 calculates the number of days between two date numbers, based on a 360-day year (12 months, each with 30 days)

DATEINFO(*date,attribute*)

Returns information about a date number. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

date is a date number. Usually another date function supplies the date number

attribute is an integer from this table

1	Day of the week as a label, in short form (Mon)
2	Day of the week as a label, in long format (Monday)
3	Day of the week as an integer from 0 (Monday) through 6 (Sunday)
4	Week of the year as an integer from 1 to 53
5	Month of the year as a label, in short format (Jan)
6	Month of the year as a label, in long format (January)
7	Number of days in the month specified by *date*
8	Number of days left in the month specified by *date*
9	Last day of the month specified by *date*
10	The quarter *date* is in, as an integer from 1 (Q1) to 4 (Q4)
11	1 if the year specified by *date* is a leap year; 0 if the year is not a leap year
12	Day of the year specified by *date*, as a number from 1 to 366
13	Days left in the year specified by *date*, as a number

Examples

Cell=DATEINFO(23063,7) returns 28, the number of days in February, 1963

Cell=DATEINFO(DATE(92,10,5),10) returns 4 because October is in the fourth quarter

DATEVALUE(*date-string*)

Calculates the date number for the date specified as text in *date-string*

Use DATEVALUE when you want to convert dates entered as text to date numbers that you can use in calculations

Arguments:

date-string can be text enclosed in double quotes. The text must look like one of the automatic date formats that Improv supports

Examples:

Cell = DATEVALUE(Birthday:JSmith) returns 20723, if *Birthday:JSmith* contains the text 25-Sep-56

Cell=DATEVALUE("23-May-87") returns 31920, the date number for May 23, 1987

Related functions: DATE calculates the date number for specified year, month, and day values.
TIMEVALUE converts text that looks like a time into a time number

DAY(*date-number*)

Calculates the day of the month (1 to 31) in the specified *date-number*

Use DAY when you need to know only the day of the month, not the entire date. DAY can also supply the *day* argument for other date/time functions that build on previously calculated dates

Arguments: *date-number* can be any integer from 1 (January 1, 1900) to 73050 (December 31, 2099), inclusive. Usually another date function supplies *date-number*

Examples:

Cell=DAY(TODAY) = returns the current day of the month

Cell=DAY(DATE(85,3,27)) = 27

Cell=DAY(Birthday:JSmith) returns 25, if *Birthday:JSmith* contains the date number 20723, which represents the date September 25, 1956

Related functions: MONTH calculates number of the month from a date number. YEAR calculates the number of the year from a date number

MONTH (*date-number*)

Calculates the month (1 to 12) in a specified *date-number*

Arguments: *date-number* can be any integer from 1 (January 1, 1900) to 73050 (December 31, 2099) inclusive. Usually, another date function supplies *date-number*

Examples:

Cell=MONTH(DATE(85,3,27)) returns 3

Cell=MONTH(20181) returns 4, because 20181 is the date number for April 2, 1955

Cell=MONTH(TODAY) returns an integer representing the current month

Related functions: DAY calculates the day of the month in a date number. YEAR calculates the number of the year in a date number. WEEKDAY calculates the day of the week in a date number

WEEKDAY(*date-number*)

Calculates the day of the week in a date number and displays it as an integer from 0 (Monday) to 6 (Sunday). If this function is not available, you must use the ADDINS20.LSS scriptto register it

Arguments: *date-number* can be any date number. Usually another date function supplies *date-number*

Examples:

Cell=WEEKDAY(DATE(91,7,3)) returns 2, Wednesday

Related functions: MONTH calculates the month in a date number. YEAR calculates the year in a date number

WORKDAY(*start-date-number,days,[holidays-list],[weekends-string]*)

Calculates the date number that corresponds to the date that is a specified number of *days* before or after *start-date-number,* excluding weekends and holidays. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

start-date-number can be any integer from 1 (January 1, 1900) to 73050 (December 31, 2099), inclusive. Usually another date function supplies *date-number*

days can be an integer. Use a positive integer to specify a number of days after *start-date* or a negative integer to specify a number of days before *start-date*

holidays-list is an optional argument that specifies the holidays to exclude from the calculation. *holidays-list* can be any combination of date numbers, names of cells that contain date numbers, or expressions that return date numbers, separated by commas or semicolons. If you omit the *holidays-list* argument, WORKDAY excludes only weekends from the calculation

weekends-string is an optional argument that specifies which days of the week to consider as weekends. *weekends-string* is a string that contains each day as an integer from 0 (Monday) to 6 (Saturday). For example, "45" indicates that Friday and Saturday are weekend days. If you omit the *weekend-string* argument, WORKDAY uses "56", which indicates that Saturday and Sunday are weekends. To specify no weekends, use the string "7"

Examples: This formula determines the date that is four working days after Wednesday, January 22, 1992:

Cell=WORKDAY(DATE(92,1,22),4) returns 33631, or Tuesday, January 28, 1992

Related functions: D360 calculates the number of days between two date numbers, based on a 360-day year

YEAR(*date-number*)

Calculates the year -- an integer from 0 (1900) to 199 (2099), inclusive -- from a date number

Arguments: *date-number* can be any integer from 1 (January 1, 1900) to 73050 (December 31, 2099), inclusive. Usually another date function supplies *date-number*

Notes: Add 1900 to convert the result of YEAR into a 4-digit year

Examples:

Cell=YEAR(20181)+1900 returns 1955, because 20181 is the date number for April 2, 1955

Cell=YEAR(DATEVALUE("14-Feb-92")) returns 92

Cell=YEAR(TODAY) returns the current year

Related functions: DAY calculates the day of the month (1 to 31) in a date number. MONTH calculates the month (1 to 12) in a date number. WEEKDAY calculates the day of the week (0 to 6) in a date number

HOUR(*time-number*)

Calculates the hour (an integer from 0 (midnight) to 23 (11:00 PM)) in a *time-number*

Use HOUR to extract the hour portion of time numbers created with NOW, TIME, and TIMEVALUE. The hour portion is useful in calculations that involve whole hours

Arguments: *time-number* can be any value from .000000 (midnight) through .999988 (11:59:59 PM), inclusive. Usually another time function supplies *time-number*

Examples:

HOUR(TIME(13,45,18)) returns 13 (1:00 PM)

Related functions: MINUTE calculates the minutes in a time number. SECOND calculates the seconds in a time number

MINUTE(*time-number*)

Calculates the minutes (an integer from 0 to 59, inclusive) in a *time-number*

Use MINUTE in calculations that involve only minutes, such as the time that has elapsed since the start of an application

Arguments: *time-number* can be any value from .000000 (midnight) to .999988 (11:59:59 PM), inclusive. Usually another time function supplies *time-number*

Examples:

Cell=MINUTE(TIME(11,15,45)) returns 15, because 15 is the *minutes* argument for TIME(11,15,45)

Related functions: HOUR calculates the hour in a time format. SECOND calculates the seconds in a time number

SECOND(*time-number*)

Calculates the seconds (an integer from 0 to 59, inclusive), in a *time-number*

Use SECOND in calculations that involve only the seconds portion of time numbers that you created with NOW, TIME, or TIMEVALUE

Arguments: *time-number* can be any decimal value from .000000 (midnight) to .999988 (11:59:59 PM), inclusive. Usually another time function supplies *time-number*

Examples:

SECOND(TIME(11,15,45)) displays 45 because 45 is the *seconds* argument of TIME(11,15,45)

Related functions: HOUR calculates the hour of a time number. MINUTE calculates the minutes of a time number

TIME(*hour,minutes,seconds*)

Calculates the time number for the specified *hour*, *minutes*, and *seconds*

Use TIME to enter time numbers that you can use in time calculations; for example, to determine the difference between two times

Arguments:

hour can be any integer from 0 (midnight) to 23 (11:00 PM), inclusive

minutes can be any integer from 0 to 59, inclusive

seconds can be any integer from 0 to 59, inclusive

Notes: The result of TIME does not look like a time until you apply a time format to the cell

Examples: This formula calculates a consultant's payment, assuming a hourly payment rate of $95:

Cell=(TIME(13,0,0)-TIME(9,15,0))*95*24 returns $356.25

Related functions: TIMEVALUE converts a time entered as text into a time number

TIMEVALUE(*string*)

Converts a time entered as text into a time number

Arguments: *string* can be text that is enclosed in double quotes and entered in one of the following formats: HH:MM:SS AM/PM or HH:MM AM/PM

Notes: The result of TIMEVALUE doesn't look like a time until you assign a time format to the cell

Examples:

TIMEVALUE("08:19:27 AM") returns 0.34684

Related functions: TIME calculates the time number for the specified hour, minutes, and seconds

NOW

Calculates the date and time number that corresponds to the current date and time set on your computer. This includes both a date number (integer portion) and a time number (decimal portion)

Use NOW to produce a record of the current date and time which you can use in a calculation; for example, determining how overdue a payment is

Notes: Each time your worksheet recalculates, NOW updates the current date and time

The result of NOW does not look like a date or time until you assign a date or time format to the cell

Examples:

Cell=@NOW returns 33707.7121 at 5:05 PM on April 13, 1992

TODAY

Calculates the date number that corresponds to the current date set on your computer's clock

Notes: The result of TODAY does not look like a date or a time until you assign a date or time format to the cell

Examples:

Cell=@TODAY returns 31048 on January 1, 1985

Cell=@TODAY returns 32688 on June 29, 1989

Related functions: NOW calculates the date and time number that corresponds to the current date and time set on your computer's clock

Use this table of functions to quickly look up the uses of Financial functions. The functions whose names are followed by an asterisk (*) are add-in functions that you must attach to Improv before you can use them (see Registering the add-in functions)

Annuities

FV: calculates the future value of a series of equal payments, where the investment is an ordinary annuity

FVAL*: calculates the future value of a series of equal payments, where the investment is either an ordinary annuity or an annuity due

IPAYMT*: calculates the cumulative interest portion of the periodic payment on a loan at a given interest rate for a specified number of payment periods

IRATE*: calculates the interest rate per period necessary for a series of equal payments to grow to a future value

NPER*: calculates the number of payment periods of an investment, where the investment is an ordinary annuity or an annuity due

PMT: calculates the amount of the payment per period needed to pay off a loan, where the investment is an ordinary annuity

PAYMT*: calculates the amount of the payment per period needed to pay off a loan, where the investment is an ordinary annuity or an annuity due

PPAYMT*: calculates the cumulative principal portion of the periodic payment for an loan, where the investment is either an ordinary annuity or an annuity due

PV: calculates the present value of a series of equal payments, where the investment is an ordinary annuity

PVAL*: calculates the present value of a series of equal payments, where the investment is either an ordinary annuity or an annuity due

TERM: calculates the number of payment periods of an investment, where the investment is an ordinary annuity

Securities

ACCRUED*: calculates the accrued interest for securities with periodic interest payments

PRICE*: calculates the price per $100 face value for securities that pay periodic interest

YIELD*: calculates the yield for securities that pay periodic interest

Capital Budgeting

IRR: returns the internal rate of return for a series of cash flows

MIRR*: calculates the modified internal rate of return for a series of cash flows

NPV: calculates the net present value of a series of future cash flows

Depreciation

DB*: calculates the declining-balance depreciation allowance of an asset for one period

DDB: calculates the double-declining balance depreciation allowance of an asset

SLN: calculates the straight-line depreciation allowance of an asset

SYD: calculates the sum-of-the-years'-digits depreciation allowance of an asset

VDB: calculates the variable-rate declining depreciation allowance of an asset

Single-Sum Compounding

CTERM:calculates the number of compounding periods necessary for an investment to grow to a future value

RATE: calculates the interest rate per period necessary for an investment to grow to a future value

FV(*payment,interest,term*)

Calculates the future value of an investment, based on a series of equal payments, earning an interest rate per period, over the number of payment periods in term. FV assumes that the investment is an ordinary annuity

Arguments:

payment and *term* can be any value

interest is a value representing the interest rate per period entered either as a percentage (with the % symbol) or as a decimal value

Notes: Enter *interest* and *term* in the same increment. For example, if you are calculating a monthly payment, enter the interest and term in monthly increments. Usually, this means you must divide the interest rate and the number of years in *term* by 12

FV assumes the investment you are calculating is an ordinary annuity -- that is, one in which you make payments at the end of the period. To calculate the future value of an annuity due -- that is, one in which you make the payments at the beginning of each period -- use the formula
FV(*payment,interest,term*)*(1+*interest*) or use FVAL
(See the *Handbook*, Appendix A for the formula used to calculate FV)

Examples: For the next 20 years, you plan to deposit $2000 on the last day of each year into an individual retirement account. The account pays 8% interest, compounded annually. Interest is paid on the last day of each year. This formula calculates the value of your account in 20 years:

Cell=FV(2000,8%,20) returns $91,524

Related functions: FVAL calculates the future value of a series of equal payments, where the investment is either an ordinary annuity or an annuity due. PV and PVAL calculate the present value of a series of equal payments. NPV calculates the net present value of a series of future cash flows

FVAL(*payments,interest,term,[type],[present-value]*)

Calculates the future value of an investment with a specified present-value based on a series of equal payments, earning a periodic interest rate, over the number of payment periods in term. FVAL calculates for either an ordinary annuity or an annuity due, depending on the value you specify for *type*. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

payments and *term* can be any value

interest is the interest rate per period entered either as a percentage (with the % symbol) or as a decimal value. *interest* is a value greater than -1

type is an optional argument from this table:

type	**FVAL calculates**
0	Ordinary annuity (payment due at the end of the period). 0 is the default is you omit the *type* argument
1	Annuity due (payment due at the beginning of the period)

present-value is an optional argument that specifies the present value of the series of future payments. *present-value* can be any value. If you omit the *present-value* argument, FVAL uses 0

You cannot use an optional argument without using the ones that precede it

Notes: If you're calculating an ordinary annuity, you can use FV, which is not an add-in function

Enter *interest* and *term* in the same increment. For example, if you are calculating a monthly payment, enter the interest and term in monthly increments. Usually this means you must divide the interest rate and the number of years in *term* by 12

(See the *Handbook*, Appendix A for the formula used to calculate FVAL)

Examples: For the next 20 years, you plan to deposit $2000 on the first day of each year into an individual retirement account. The account pays 7.5% interest, compounded annually. Interest is paid on the last day of each year. This formula calculates the value of your account in 20 years:

Cell=FVAL(2000,0.075,20,1) returns $93,105.06

Related functions: PV and PVAL calculate the present value of a series of equal payments. NPV calculates the net present value of a series of future cash flows

IPAYMT(*principal,interest,term,start-period,[end-period],[type],[future-value])*

Calculates the cumulative interest portion of the periodic payment on a loan at a given interest rate for a specified number of payment periods. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

principal is the value of the loan

interest is the interest rate per period entered either as a percentage (with the % symbol) or as a decimal value. *interest* is a value greater than -1

term is a value representing the number of payment periods. *term* can be any value except 0

start-period is the point in the loan's term when you want to begin calculating interest. *start-period* can be any value greater than or equal to 0, but it cannot be greater than *term*

end-period is the point in the loan's term when you want to stop calculating interest. *end-period* can be any value greater than or equal to *start-period.* If you omit the *end-period* argument, *end-period* equals *start-period*

type is an optional argument from this table:

type	IPAYMT calculates
0	Ordinary annuity (payment due at the end of the period). 0 is the default if you omit the *type* argument
1	Annuity due (payment due at the beginning of the period)

future-value is an optional argument that specifies the future value of the series of payments. *future-value* can be any value. If you omit the *future-value* argument, IPAYMT uses 0

You cannot use an optional argument without using the ones that precede it

Notes: Enter *interest* and *term* in the same increment. For example, if you are calculating a monthly payment, enter the interest and term in monthly increments. Usually, this means you must divide the interest rate and the number of years in *term* by 12
(See the *Handbook*, Appendix A for the formula used to calculate IPAYMT)

Examples: You took out an $8000 loan for 3 years at an annual interest rate of 10.5%, compounded monthly. Your monthly payments are $260.02. This formula calculates the interest portion of the last year's payments:

Cell=IPAYMT(8000,0.105/12,36,25,36) returns $170.45

Related functions: PMT and PAYMT calculate the periodic payment on a loan. PPAYMT calculates the cumulative principal portion of the period payment on a loan

IRATE(*term,payment,present-value,[type],[future-value],[guess]*

Calculates the periodic interest rate necessary for an investment to grow to a future-value over the number of compounding periods in term. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

term, *payment*, and *present-value* are values

type is an optional argument from this table:

type	IRATE calculates
0	Ordinary annuity (payment due at the end of the period). 0 is the default if you omit the *type* argument
1	Annuity due (payment due at the beginning of the period)

future-value is an optional argument that specifies the future value of the series of payments. *future-value* can be any value. If you omit the *future-value* argument, IRATE uses 0

guess is an optional argument that represents your estimate of the interest rate. *guess* is a value from 0 to 1, inclusive. If you omit the *guess* argument, IRATE uses .10 (10%)

You cannot use an optional argument without using the ones that precede it

Notes: IRATE uses a series of approximations, starting with your guess value, to calculate the interest rate. Start with a guess that you feel is reasonable for the interest rate. More than one solution may be possible, so try another guess if IRATE returns a value that is less than 0 or greater than 1

If IRATE cannot approximate the result to within 0.0000001 after 30 calculation iterations, the formula returns *Error*. If your guesses continue to return *Error*, use NPV to determine a better *guess*. If NPV returns a positive value, *guess* is too low. If NPV returns a negative value, *guess* is too high. NPV returns 0 if *guess* is accurate

(See the *Handbook*, Appendix A for the formula used to calculate IRATE)

Examples: You deposit $6000 in an account and want to withdraw $100 per month for eight years. This formula calculates the interest you need to earn in order to make the withdrawals:

IRATE(96,100,6000,0,0,0.1) returns 0.010623, or 1.06% compounded monthly

Related functions: NPV calculates the net present value of a series of future cash flows. PV and PVAL calculate the present value of an annuity. FV and FVAL calculate the future value of an annuity. RATE returns the periodic interest rate necessary for an investment to grow to a future value

NPER(*payments,interest,future-value,[type],[present-value])*

Calculates the number of periods required for a series of equal payments with a specified present-value to accumulate a future-value at a periodic interest rate. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

payments is the value of the equal investments. *payments* can be any value except 0

interest is a value representing the interest rate per period entered either as a percentage (with the % symbol) or as a decimal value. *interest* can be any value greater than -1

future-value is the amount you want to accumulate. *future-value* can be any value

type is an optional argument from this table:

type	NPER calculates
0	Ordinary annuity (payment due at the end of the period). 0 is the default if you omit the *type* argument
1	Annuity due (payment due at the beginning of the period)

present-value is an optional argument that specifies the present value of a series of future payments. *present-value* can be any value. If you omit the *present-value* argument, NPER uses 0

You cannot use an optional argument without using the ones that precede it

Notes: If you're calculating an ordinary annuity, you can use TERM, which isn't an add-in function

(See the *Handbook*, Appendix A for the formula used to calculate NPER)

Examples: You deposit $2000 at the beginning of each year into a savings account. The account earns 7.5% a year, compounded annually. This formula calculates how long it will take to accumulate $100000:

Cell=NPER(2000,0.075,100000,1) returns 20.76 (years)

Related functions: CTERM calculates the number of compounding periods for a single-sum investment to grow to a future value

PMT(*principal,interest,term*)

Calculates the payment on a loan at a given interest rate per period for a specified number of payment periods. PMT calculates the payment for an ordinary annuity

Use PMT to calculate the payment necessary to amortize a loan or the payment per period returned by an annuity

Arguments:

principal is the value of the loan

interest is a value representing the interest rate per period entered as a percentage (with the % symbol) or a decimal value

term is a value representing the number of payment periods

Notes: Enter *interest* and *term* in the same increment. For example, if you are calculating a monthly payment, enter the interest and term in monthly increments. Usually, this means you must divide the interest rate and the number of years in *term* by 12

PMT assumes that you are calculating the payment on an ordinary annuity. To calculate the payment per period of an annuity due -- that is, one in which you make payments made at the beginning of each period -- use the formula PMT(*principal*,*interest*,*term*)/1+*interest*) or use PAYMT

(See the *Handbook*, Appendix A for the formula used to calculate PMT)

Examples: You take out a 3-year, $8,000 auto loan that has an annual interest rate of 14%, compounded monthly. This formula calculates the monthly payment:

Cell=PMT(8000,.14/12,36) returns $273.42

PAYMT(*principal,interest,term,[type],[future-value])*

Calculates the payment on a loan at a given interest rate for a specified number of payment periods. PAYMT calculates the payment for either an ordinary annuity or an annuity due. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

principal is the value of the loan

interest is a value representing the interest rate per period entered either as a percentage (with the % symbol) or as a decimal value. *interest* can be any value greater than -1

term is a value representing the number of payment periods

type is an optional argument from this table:

type	**PAYMT calculates**
0	Ordinary annuity (payment due at the end of the period). 0 is the default is you omit the *type* argument
1	Annuity due (payment due at the beginning of the period)

future-value is an optional argument that specifies the future value of the series of payments. *future-value* can be any value. If you omit the *future-value* argument, PAYMT uses 0

You cannot use an optional argument without using the ones that precede it

Notes: If you're calculating an ordinary annuity, you can use PMT, which is not an add-in function

Enter *interest* and *term* in the same increment. For example, if you are calculating a monthly payment, enter the interest and term in monthly increments. Usually, this means you must divide the interest rate and the number of years in *term* by 12

(See the *Handbook*, Appendix A for the formula used to calculate PAYMT)

Examples: You are considering taking out an $8000 loan for 3 years at an annual interest rate of 10.5%, compounded monthly. Payments are due on the first day of each month. This formula calculates your monthly payment:

Cell=PAYMT(8000,0.105/12,36,1,0) returns $257.76

Related functions: IPAYMT calculates the cumulative interest portion of the periodic payment for an investment. PPAYMT calculates the cumulative principal portion of the periodic payment on a loan. TERM calculates the number of payment periods of an investment

PPAYMT(*principal,interest,term,start-period,[end-period],[type],[future-value])*

Calculates the principal portion of the periodic payment on a loan at a given interest rate for a specified number of payment periods. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

principal is the value of the loan

interest is the interest rate per period entered either as a percentage (with the % symbol) or as a decimal value. *interest* is a value greater than -1

term is a value representing the number of payment periods. *term* can be any value except 0

start-period is the point in the loan's term when you want to begin calculating principal. *start-period* can be any value greater than or equal to 0, but it cannot be greater than *term*

end-period is the point in the loan's term when you want to stop calculating principal. *end-period* can be any value greater than or equal to *start-period.* If you omit the *end-period* argument, *end-period* equals *start-period*

type is an optional argument from this table:

type	PPAYMT calculates
0	Ordinary annuity (payment due at the end of the period). 0 is the default if you omit the *type* argument
1	Annuity due (payment due at the beginning of the period)

future-value is an optional argument that specifies the future value of the series of payments. *future-value* can be any value. If you omit the *future-value* argument, PPAYMT uses 0

You cannot use an optional argument without using the ones that precede it

Notes: Enter *interest* and *term* in the same increment. For example, if you are calculating a monthly payment, enter the interest and term in monthly increments. Usually, this means you must divide the interest rate and the number of years in *term* by 12

Examples: You took out an $8000 loan for 3 years at an annual interest rate of 10.5%, compounded monthly. Your monthly payments are $260.02. This formula calculates the principal portion of the last year's payments:

Cell=PPAYMT(8000,0.105/12,36,25,36) returns $2949.79

Related functions: PMT calculates the payment on a loan at a given interest rate for a specified number of payment periods. IPAYMT calculates the cumulative interest portion of the periodic payment on a loan

PV(*payment,interest,term*)

Calculates the present value of an investment, based on a series of equal payments, discounted at an interest rate per period over the number of periods in the term. PV assumes that the investment is an ordinary annuity

Arguments:

payment can be any value

interest is a value representing the interest rate per period entered as a percentage (with the % symbol) or a decimal value

term is a value representing the number of payment periods

Notes: Enter *interest* and *term* in the same increment. For example, if you are calculating a monthly payment, enter the interest and term in monthly increments. Usually, this means you must divide the interest rate and the number of years in *term* by 12

PV complements PMT. PV tells you how large a loan you can take out, given the size of the monthly payment you can afford. Conversely, PMT tells you how large your monthly payment will be, given the size of the loan you want to take out

PV assumes that you are calculating the present value of an ordinary annuity -- that is, one in which you make the payment at the end of the period. To calculate the present value of an annuity due -- that is, one in which you make the payment at the beginning of the period -- use the formula PV(*payment*,*interest*,*term*)*(1+*interest*) or use PVAL
(See the *Handbook*, Appendix A for the formula used to calculate PV)

Examples: You won $1,000,000. You can take your winnings as 20 annual payments of $50,000. (You'll receive each payment at the end of each year). Or you can take a single lump-sum payment of $400,000. You assume that if you were to accept the annual payments of $50,000, you would invest the money at a rate of 8%, compounded annually. This formula calculates the present value of the 20 payments:

Cell=PV (50000,.08,20) returns $490,907. You are better off taking the 20 payments

Related functions: FV and FVAL calculate the future value of a series of equal payments. NPV calculates the net present value of a series of cash-flows

PVAL(*payments,interest,term,[type],[future-value])*

Calculates the present value of an investment, with a specified future-value, based on a series of equal payments, discounted at a periodic interest rate over the number of periods in term. PVAL can calculate the present value of either an ordinary annuity or an annuity due. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

payments can be any value

interest is the interest rate per period entered as a percentage (with the % symbol) or a decimal value. *interest* can be any value greater than -1

term is a value representing the number of payment periods

type is an optional argument from this table:

type	**PVAL calculates**
0	Ordinary annuity (payment due at the end of the period). 0 is the default if you omit the *type* argument
1	Annuity due (payment due at the beginning of the period)

future-value is an optional argument that specifies the future value of the series of payments. *future-value* can be any value. If you omit the *future-value* argument, PVAL uses 0

You cannot use an optional argument without using the ones that precede it

Notes: If you're calculating an ordinary annuity, you can use PV, which is not an add-in function

Enter *interest* and *term* in the same increment. For example, if you are calculating a monthly payment, enter the interest and term in monthly increments. Usually, this means you must divide the interest rate and the number of years in *term* by 12

Use PVAL to evaluate an investment or to compare one investment with others. PVAL is useful in comparing different types of investments. For example, comparing a single-payment from a pension fund with a series of periodic payments. Use PVAL with PMT to create an amortization table

PVAL complements PMT. PVAL tells you how large a loan you can take out, given the size of the monthly payment you can afford. Conversely, PMT tells you how large your monthly payment will be, given the size of the loan you want to take out

(See the *Handbook*, Appendix A for the formula used to calculate PVAL)

Examples: You won $1,000,000. You can take your winnings as 20 annual payments of $50,000. (You'll receive each payment at the beginning of each year.) Or you can take a single lump-sum payment of $400,000. You assume that if you were to accept the annual payments of $50,000, you would invest the money at a rate of 8%, compounded annually. This formula calculates the present value of the 20 payments:

Cell=PVAL(50000,.08,20,1) returns $530,180. You are better off taking the 20 payments

Related functions: FV and FVAL calculate the future value of an annuity. NPV calculates the net present value of a series of future cash flows. PMT and PAYMT calculate the periodic payment on a loan

TERM(*payment*,*interest*,*future-value*)

Calculates the number of equal payments required for an investment to grow to a future value, given a specified interest rate per period

Arguments:

payments is a value representing equal investments

interest is the interest rate per period entered as either a percentage (with the % symbol) or a decimal value

future-value is a value representing the amount you want to accumulate

Notes: TERM assumes that the investment is an ordinary annuity -- that is, one in which payments are made at the end of the period. To calculate the term of an annuity due -- that is, one in which payments are made at the beginning of the period -- use the formula TERM(*payment,interest,future-value*/(1+*interest*)) or use the NPER function

(See the *Handbook*, Appendix A for the formula used to calculate TERM)

Examples: You deposit $2000 at the end of each year into a bank account. The account earns 7.5% a year, compounded annually. This formula calculates how many years it will take to accumulate $100,000 in the account:

Cell=TERM(2000,7.5,100000) returns 21.5 (years)

Related functions: CTERM calculates the number of compounding periods it will take for an investment to grow to a specified future value

ACCRUED(*settlement,maturity,coupon,[par],[frequency],[basis])*

Calculates the accrued interest for securities with periodic interest payments. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

settlement is the security's settlement date. *settlement* is a date number

maturity is the security's maturity date. *maturity* is a date number. If *maturity* is less than or equal to *settlement*, ACCRUED returns *Error*

Usually another function supplies the *settlement* and *maturity* date numbers

coupon is the security's annual coupon rate. *coupon* is any positive value or 0

par is an optional argument that specifies the security's par value -- that is, the principal to be paid at maturity. *par* is a positive value. If you do not include the *par* argument, ACCRUED uses 100

frequency is an optional argument from this table:

frequency	Frequency of coupon payments
1	Annual
2	Semiannual (2 is the default if you omit the frequency argument)
4	Quarterly
12	Monthly

basis is an optional argument from this table:

basis	Day count basis
0	30/360 (0 is the default if you omit the *basis* argument)
1	Actual/actual
2	Actual/360
3	Actual/365

You cannot use an optional argument without using the ones that precede it

Examples: A bond has a July 1, 1993 settlement date and a December 1, 1998 maturity date. The semi-annual coupon rate is 5.50%. The bond has a $100 par value, and a 30/360 day-count basis. This formula calculates the bond's accrued interest:

Cell=ACCRUED(DATE(93,7,1),DATE(98,12,1),0.055,100,2,0) returns 0.458333, or 4.58%

Related functions: PRICE calculates the price of a bond as a percentage of par. YIELD calculates the yield to maturity for a bond

PRICE(*settlement,maturity,coupon,yield,[redemption],[frequency],[basis]*)

Calculates the price per $100 face value for securities that pay periodic interest. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

settlement is the security's settlement date. *settlement* is a date number

maturity is the security's maturity date. *maturity* is a date number. If *maturity* is less than or equal to *settlement*, PRICE returns *Error*

Usually another function supplies the *settlement* and *maturity* date numbers

coupon is the security's annual coupon rate. *coupon* is any positive value or 0

yield is the security's annual yield. *yield* is any positive value

redemption is an optional argument that specifies the security's redemption value per $100 face value. *redemption* is any positive value or 0. If you omit the *redemption* argument, PRICE uses 100

frequency is an optional argument from this table:

frequency	Frequency of coupon payments
1	Annual
2	Semiannual (2 is the default if you omit the frequency argument)
4	Quarterly
12	Monthly

basis is an optional argument from this table:

basis	Day count basis
0	30/360 (0 is the default if you omit the *basis* argument)
1	Actual/actual
2	Actual/360
3	Actual/365

You cannot use an optional argument without using the ones that precede it

Examples: A bond has a July 1, 1993, settlement date and a December 1, 1998, maturity date. The semiannual coupon rate is 5.50%, and the annual yield is 5.61%. The bond has a $100 redemption value and a 30/360 day-count basis. This formula calculates the bond's accrued interest:

Cell=PRICE(DATE(93,7,1),DATE(98,12,1),0.055,0.0561,100,2,0) returns $99.49

Related functions: ACCRUED calculates the accrued interest for securities that pay periodic interest. YIELD calculates the yield for securities that pay periodic interest

YIELD(*settlement,maturity,coupon,price,[redemption],[frequency],[basis]*)

Calculates the yield for securities that pay periodic interest. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

settlement is the security's settlement date. *settlement* is a date number

maturity is the security's maturity date. *maturity* is a date number. If *maturity* is less than or equal to *settlement*, YIELD returns *Error*

Usually another function supplies the *settlement* and *maturity* date numbers

coupon is the security's annual coupon rate. *coupon* can be any positive value or 0

price is the security's price per $100 face value. *price* can be any positive value

redemption is an optional argument that specifies the security's redemption value per $100 face value. *redemption* is any positive value or 0. If you omit the *redemption* argument, YIELD uses 100

frequency is an optional argument from this table:

frequency	Frequency of coupon payments
1	Annual
2	Semiannual (2 is the default if you omit the *frequency* argument)
4	Quarterly
12	Monthly

basis is an optional argument from this table:

basis	Day count basis
0	30/360 (0 is the default if you omit the basis argument)
1	Actual/actual
2	Actual/360
3	Actual/365

You cannot use an optional argument without using the ones that precede it

Examples: A bond has a July 1, 1993, settlement date and a December 1, 1998, maturity date. The semiannual coupon rate is 5.50%. The bond costs $99.50, has a $100 redemption value, and a 30/360 day-count basis. This formula calculates the bond's yield:

Cell=YIELD(DATE(93,7,1),DATE(98,12,1),0.055,99.5,100,2,0) returns 0.056072

Related functions: ACCRUED calculates the accrued interest for securities that pay periodic interest. PRICE calculates the price per $100 face value for securities that pay periodic interest

IRR(*guess,group* or *range*)

Calculates the internal rate of return (profit) for a series of cash flows generated by an investment. The internal rate of return is the percentage at which the present value of an expected future series of cash flows equals the present value of the initial investment. IRR assumes the cash flows are received at regular, equal intervals

Arguments:

guess represents your estimate of the internal rate of return. *guess* can be any value entered either as a percentage (with the % symbol) or a decimal value

group or *range* is the group or range that contains the cash flows. Improv considers negative numbers as cash outflows and positive numbers as cash inflows. Normally, the first cash-flow amount is a negative number representing the investment. IRR assigns the value 0 to cells containing text and to blank cells and includes those cells in the calculation

Notes: IRR uses a series of approximations to calculate the internal rate of return. Because IRR uses approximations, you enter a guess as the first argument. In most cases, *guess* should be a percentage between 0 (0%) and 1 (100%). More than one solution may be possible, so try another guess if IRR returns a value that is less than 0 or greater than 1

If IRR cannot approximate the result to within 0.0000001 after 20 calculation iterations, the formula returns *Error.* If your guesses continue to return *Error,* use NPV to determine a better *guess*. If NPV returns a positive value, *guess* is too low. If NPV returns a negative value, *guess* is too high. NPV returns 0 if *guess* is accurate

Examples: See the *Handbook*, Appendix A

Related functions: MIRR calculates the modified internal rate of return. NPV calculates the net present value of a series of future cash flows. PV and PVAL calculate the present value of a series of equal payments. FV and FVAL calculate the future value of an annuity. RATE calculates the interest rate per period necessary for an investment to grow to a future value

MIRR*(group* or *range,finance-rate,reinvest-rate)*

Calculates the modified internal rate of return (profit) for a series of cash flows generated by an investment. The internal rate of return is the percentage at which the present value of an expected future series of cash flows equals the initial investment. MIRR assumes the cash flows are received at regular, equal intervals. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

group or *range* is a group or range that contains the cash flows. MIRR considers negative numbers as cash outflows and positive numbers as cash inflows. *range* must contain at least one positive value and one negative value. Normally, the first cash-flow amount in the range is a negative number (cash outflow) that represents the investment

finance-rate is the interest rate paid on money used in cash flows

reinvest-rate is the interest rate you receive on cash flows as you reinvest them

finance-rate and *reinvest-rate* can be any values entered either as percentages (with the % symbol) or as decimal values

Notes: (See the *Handbook*, Appendix A for the formula used to calculate MIRR)

Examples: See the *Handbook*, Appendix A

Related functions: IRR calculates the internal rate of return

NPV(*interest,group* or *range*)

Calculates the net present value of a series of future cash flows, discounted at a fixed interest rate per period

Arguments:

interest is a value representing the interest rate per period entered as either a percentage (with the % symbol) or a decimal value

group or *range* is the group or range that contains the cash flows

Notes: NPV assumes that the cash outflows occur at equal time intervals, that the first cash outflow occurs at the end of the first period, and that subsequent cash outflows occur at the end of subsequent periods

To determine the net present value of an investment in which you make an initial cash outflow immediately, followed by a series of future inflows, you must factor the initial outflow separately because it is not affected by the interest. Use the formula

$$\frac{\text{npv}(int,group)}{(1 + int)}$$

(See the *Handbook*, Appendix A for the formula used to calculate NPV)

Examples: See the *Handbook*, Appendix A

Related functions: PV and PVAL calculate the present value of a series of equal payments. FV and FVAL calculate the future value of a series of equal payments

DB*(cost, salvage, life, period)*

Uses the fixed-declining balance method to calculate the depreciation allowance of an asset for a specified period of time. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

cost is the amount paid for the asset. *cost* can be any positive value of 0. If *cost* is 0, the result of DB is 0

salvage is the value of the asset at the end of its life. *salvage* can be any positive value or 0. If *salvage* is greater that *cost*, the result of DB is negative. If *salvage* is 0, the depreciation rate will be 1/*life*

life is the number of periods the asset takes to depreciate to its *salvage* value. *life* can be any value greater than or equal to 1 and less than or equal to *life*

period is the time period for which you want to find the depreciation allowance. *period* can be any value greater than or equal to 1

You must express *life* and *period* in the same units, typically years

Notes: The fixed-declining balance method slows the rate of depreciation in comparison to the double-declining balance method so more depreciation expense occurs (and can be written off) in later periods. Depreciation stops when the book value of the asset -- that is, the total cost of the asset minus its total depreciation over all prior periods -- reaches the salvage value

(See the *Handbook*, Appendix A for the formula used to calculate DB)

Examples: You just purchased an office machine for $10,000. The useful life of the machine is eight years, and the salvage value after eight years is $1,200. This formula calculates the depreciation expense for the fifth year:

Cell=DB(10000,1200,8,5)returns $806.51

Related functions: DDB uses the double-declining balance method to calculate depreciation. VDB uses the variable-rate declining balance method. SLN uses the straight-line method. SYD uses the sum-of-the-years'-digits method

DDB(*cost,salvage,life,period*)

Uses the double-declining balance method to calculate the depreciation allowance of an asset for a specified period of time

Arguments:

cost is the amount paid for the asset. *cost* must be a number greater than or equal to *salvage*

salvage is the value of the asset at the end of its life. *salvage* can be any value less than or equal to *cost*

life is the number of periods the asset takes to depreciate to its salvage value. *life* must be a greater value than *period*

period is the time period for which you want to find the depreciation allowance. *period* must be a value greater than or equal to 1

You must express *life* and *period* in the same units, typically years

Notes: DDB uses the following formula:

where: *bv* = book value in that period, *n* = life of the asset

Examples: You purchase a $10,000 office machine that has a useful life of eight years and salvage value of $1,200. This formula calculates the depreciation expense for the fifth year:

Cell=DDB(10000,1200,8,5) returns $791.02

Related functions: DB uses the fixed-declining balance method to calculate depreciation. VDB uses the variable-rate declining balance method. SYD uses the sum-of-the-years'-digits method. SLN uses the straight-line method

SLN(*cost,salvage,life*)

Calculates the straight-line depreciation allowance of an asset

Arguments:

salvage is a value representing the estimated value of the asset at the end of its life

life is a value representing the number of periods (usually years) the asset takes to depreciate to its salvage value

Notes: Straight-line depreciation divides the depreciable cost (the actual cost minus the salvage value) equally into each period of the useful life of the asset

SLN uses the following formula:

where: c = cost of the asset, s = salvage value of the asset, n = useful life of the asset

Examples: You own a copier with an initial cost of $10,000, a useful life of 10 years, and a salvage value of $1,200. This formula calculates the yearly depreciation expense:

Cell = SLN(10000, 1200, 10) returns $880

Related functions: DB uses the fixed-declining balance method to calculate depreciation. DDB uses the double-declining balance method. SYD uses the sum-of-the-years'-digits method. VDB uses the variable-rate declining balance method

SYD(*cost,salvage,life,period*)

Calculates the sum-of-the-years'-digits depreciation allowance of an asset for a specified period

Arguments:

cost is a value representing the amount paid for the asset

salvage is the value representing the value of the asset at the end of its life

life is a value representing the number of periods (typically years) the asset will take to depreciate to its salvage value

period is a value representing the time period for which you want to find the depreciation allowance

You must express *life* and *period* in the same units, typically years

Notes: SYD uses the following formula:

where: c = cost of the asset, s = salvage value of the asset, p = period for which depreciation is being calculated, n = calculated useful life of the asset

Examples: You buy a copier with an initial cost of $5,000, a useful life of four years, and a salvage value of $500. This formula calculates depreciation for the third year:

Cell=SYD(5000,500,4,3) returns $900

Related functions: DB uses the fixed-declining balance method to calculate depreciation. DDB uses the double-declining balance method. SLN uses the straight-line method. VDB uses the variable-rate declining balance method

VDB(*cost,salvage,life,start-period,end-period,[depreciation],[switch]*)

Calculates the depreciation allowance of an asset with an initial value of *cost,* an expected useful *life,* and a final value of *salvage* for a period of time specified by *start-period* and *end-period*

Arguments:

cost is a value representing the amount paid for the asset

salvage is a value representing the value of the asset at the end of its life

life is a value representing the number of periods the asset takes to depreciate to its salvage value

start-period is a value representing the point in the asset's life when you want to begin calculating depreciation

end-period is a value representing the point in the asset's life when you want to stop calculating depreciation

start-period and *end-period* correspond to the asset's life, relative to the fiscal period. For example, to find the first year's depreciation of an asset purchased at the beginning of the second quarter of a fiscal year, *start-period* is 0 and *end-period* is 0.75 (one year minus one quarter of a year)

VDB allows for the use of an initial-period option to calculate depreciation for the period the asset is placed in service. VDB uses the fractional part of *start-period* and *end-period* to determine the initial-period option. If both *start-period* and *end-period* have fractional parts, VDB uses *start-period's* fractional part

depreciation is an optional argument that specifies the decimal or percentage of straight-line depreciation you want to use as the depreciation rate. If you do not specify a *depreciation* rate, VDB uses 200% which is the double-declining balance rate

switch is an optional argument from this table:

switch	**VDB**
0	Switches to straight-line depreciation when that is greater than the declining-balance depreciation. (0 is the default if you omit the *switch* argument)
1	Does not switch to straight-line depreciation

Notes: VDB uses this formula to calculate double-declining balance depreciation:

where: *bv* = book value in that period, *d* = percentage of straight-line depreciation, *n* = useful life of the asset

VDB uses this formula to calculate straight-line depreciation:

where: *bv* = book value in that period, *s* = salvage value of the asset, *r* = remaining useful life of the asset

Examples: See the *Handbook*, Appendix A

Related functions: DB uses the fixed-declining balance method to calculate depreciation. DDB uses the double-declining balance method. SLN uses the straight-line method. SYD uses the sum-of-the-years'-digits method

CTERM(*interest,future-value,present-value*)

Calculates the total number of compounding periods it will take for a single investment to grow to a future value, earning a fixed interest rate per period

Arguments:

interest is a value representing the interest rate per period entered either as a percentage (with the % symbol) or a decimal value

future-value and *present-value* are values. Both arguments must be positive or both must be negative

Notes: Since CTERM calculates the total number of compounding periods, you need to specify the *interest* rate per period. For example, if the annual interest rate is 10% compounded monthly, enter .10/12 (the *interest* divided by the number of compounding periods) as the *interest* argument

CTERM uses the following formula:

$$\frac{\ln(fv/pv)}{\ln(1 + int)}$$

where: *fv* = future value, *pv* = present value, *int* = interest rate, ln = natural logarithm

Examples: You deposit $10,000 in an account that pays an annual interest rate of 10% compounded monthly. This formula calculates how many years it will take to double your investment:

Cell=CTERM(.10/12,20000,10000)/12 returns 6.9 (years)

Related functions: TERM calculates the number of payment periods for an investment, where the investment is an ordinary annuity. NPER calculates the number of payment periods for an investment, where the investment is an ordinary annuity or an annuity due

RATE(*future-value,present-value,term*)

Returns the interest rate per period necessary for an investment (*present-value)* to grow to a *future-value* over the number of compounding periods in *term*

Arguments: *future-value, present-value,* and *term* are value

Notes (See the *Handbook*, Appendix A for the formula used to calculate RATE)

Examples: You invested $10,000 in a bond that matures in five years and has a maturity value of $18,000. Interest is compounded monthly. This formula calculates the periodic interest rate for the investment:

Cell=RATE(18000,10000,60) returns 0.98%

Use this table of functions to quickly look up the uses of the Group functions. The functions whose names are followed by an asterisk (*) are add-in functions that you must register before you can use them (see Registering the add-in functions)

GROUPAVG: averages the values in a group or range

GROUPCOUNT: counts the nonblank cells in a group or range

GROUPMAX: finds the largest value in a group or range

GROUPMIN: finds the smallest value in a group or range

GROUPSTD: calculates the population standard deviation of the values in a group or range

GROUPSTDS: calculates the sample standard deviation of the values in a group or range

GROUPSUM: sums the values in a group or range

GROUPVAR: calculates the population variance of the values in a group or range

GROUPVARS: calculates the sample variance of the values in a group or range

GROUPAVG(*group or range*)

Calculates the average of values in a group or range

Arguments: *group* or *range* is a group or range

Notes: GROUPAVG does not count blank cells. However, cells containing text and cells that contain only space characters have the value 0 and are included in the calculation. These cells increase the total number of items in *group* or *range*; therefore, the result of GROUPAVG may not be what you want

Group functions do not include in their calculation cells calculated by other Group functions along the same category. Therefore, if you use Group functions to calculate cells in a category, you must use a Group function to perform calculations that include all cells in that category; otherwise, you'll get erroneous results

Examples: See the *Handbook*, Appendix A

Related functions: AVG and PUREAVG calculate the average of the values in a list. SELECTAVG calculates the average of values that meet specified criteria

GROUPCOUNT(*group or range*)

Calculates the number of cells in a group or range

Arguments: *group* or *range* is a group or range

Notes: GROUPCOUNT does not count blank cells. GROUPCOUNT counts every cell in *group* that contains any entry (text, value, *Error*, and *NA*)

Group functions do not include in their calculation cells calculated by other Group functions along the same category. Therefore, if you use Group functions to calculate cells in a category, you must use a Group function to perform calculations that include all cells in that category; otherwise, you'll get erroneous results

Examples: See the *Handbook*, Appendix A

Related functions: COUNT and PURECOUNT count the nonblank cells in a list. SELECTCOUNT counts the nonblank cells that meet specified criteria

GROUPMAX(*group* or *range*)

Returns the largest value in a group or range

GROUPMIN(*group* or *range*)

Returns the smallest value in a group or range

Arguments: *group* or *range* is a group or range

Notes: Cells containing text have the value 0 and are included in the calculation

Examples: See the *Handbook*, Appendix A

Related functions: MAX and PUREMAX return the largest value in a list. MIN and PUREMIN return the smallest value in a list

GROUPSTD(*group* or *range*)

Calculates the population standard deviation of the values in a group or range

GROUPSTDS(*group* or *range*)

Calculates the sample standard deviation of the values in a group or range

Arguments: *group* or *range* is a group or range

Notes: Cells containing text have the value 0 and are included in the calculation

For general information on calculating standard deviation using the population and sample methods, see the notes on STD

Examples: See the *Handbook*, Appendix A

Related functions: STD and PURESTD calculate the population standard deviation of a list of values. STDS and PURESTDS calculate the sample standard deviation of a list of values. SELECTSTD and SELECTSTDS calculate the standard deviation of values that meet specified criteria

GROUPSUM(*group* or *range*)

Adds the values in a group or range

Arguments: *group* or *range* is a group or range

Notes: Group functions do not include in their calculation cells calculated by other Group functions along the same category. Therefore, if you use Group functions to calculate cells in a category, you must use a Group function to perform calculations that include all cells in that category; otherwise, you'll get erroneous results

Examples: See the *Handbook*, Appendix A

Related functions: SUM calculates the total of the values in a list. SELECTSUM calculates the total values that meet specified criteria

GROUPVAR(*group* or *range*)

Calculates the population variance of the values in a group or range

GROUPVARS(*group or range*)

Calculates the sample population variance of the values in a group or range

Arguments: *group* or *range* is a group or range

Notes: Cells containing text have the value 0 and are used in the calculation

For general information on using the population and sample methods to calculate variance, see the notes on VAR

Examples: See the *Handbook*, Appendix A

Related functions: VAR and PUREVARcalculate the population variance in a list of values. VARS and PUREVARS calculate the sample variance in a list of values. SELECTVAR and SELECTVARS calculate the variance of the variance of values that meet specified criteria

Use this table of functions to quickly look up the uses of the Logical functions

FALSE: returns the logical value 0 (false)

IF: evaluates a condition. Takes one action if the condition is true, and takes another action if the condition is false

ISEMPTY: returns 1 (true) if a cell is blank, and 0 (false) if a cell is not blank

ISERR: returns 1 (true) for the value *Error,* and 0 (false) for any other entry

ISNA: returns 1 (true) for the value *NA,* and 0 (false) for any other entry

ISNUMBER: returns 1 (true) for a value, *NA, Error,* or blank, and 0 (false) for a string

ISSTRING: returns 1 (true) for a string, and 0 (false) for a value, *NA, Error,* or blank

TRUE: returns the logical value 1 (true)

FALSE

Returns the logical value 0

FALSE is useful in IF functions as the *y* argument, which is the value returned if the *condition* argument is not true

Notes: If a logical expression such as Input1 = Input2 is true, its logical value is 1. If it is false, its logical value is 0

Examples:

Cell=IF(Input1>500,@TRUE,@FALSE) returns 0 (false), when *Input1* contains a value less than or equal to 500

Related functions: TRUE returns the logical value 1

IF(*condition,x,y*)

Evaluates *condition*. If *condition* is true, IF returns *x*; if *condition* is false, IF returns *y*

Use IF with ERR and NA to document errors or missing data in formulas. It is also useful in preventing *Error*, *NA*, and calculation errors in situations where data may be missing or inaccurate -- for example, to prevent division by zero

Arguments:

condition can be any logical expression

x and *y* can be text enclosed in double quotes or values

Examples: See the *Handbook*, Appendix A

Related functions: CHOOSE returns the *x*th value or string from a list of values and/or strings

ISEMPTY (*cell*)

Tests *cell* to see if it is blank. If *cell* is blank, ISEMPTY returns 1 (true). If *cell* is not blank, ISEMPTY returns 0 (false)

Arguments: *cell* is the name of a cell

Notes: A blank cell is one that contains no characters and no space characters. A cell that contains space characters only appears blank. Similarly, a cell that contains an empty string ("") is not blank

Examples:

Cell=IF(ISEMPTY(Street address), "Call", "Don't Call") returns Call if *Street address* is blank, and returns Don't Call if *Street address* contains an entry

ISERR (*x*)

Tests *x* for the special value *Error.* If *x* is the value *Error,* ISERR returns 1 (true). If *x* is not the value *Error,* ISERR returns 0 (false).

Use ISERR with IF in formulas to stop the ripple-through effect of the special value *Error*

Arguments: x can be any logical expression

Notes: *Error* is the special value Improv returns when an error occurs or when you type @ERR into a cell. The word Error entered as text and the calculated value *Error* are not equivalent in formulas. ISERR does not recognize the word Error

Examples: See the *Handbook*, Appendix A

Related functions: ISNA tests for the special value NA

ISNA (*x*)

Tests *x* for the special value *NA.* If *x* is the value *NA,* ISNA returns 1 (true). If *x* is not the value *NA,* ISNA returns 0 (false)

Use ISNA in formulas to stop the ripple-through effect of the special value NA

Arguments: *x* can be any logical expression

Notes: NA is the special value that Improv returns when you type the characters @NA into a cell. The special value *NA* is not equivalent to the letters NA entered as text. ISNA does not recognize the letters NA

Examples:

Cell=IF(ISNA(Q1:Balance),0,Q1:Balance) returns 0 if *Q1:Balance* contains the special value *NA.* Consequently, all formulas that refer to *Cell* will use 0 rather than *NA* in their calculations. If *Q1:Balance* contains any other value, the formula returns the contents of *Q1:Balance*

Related functions: ISERR tests for the special value Error

ISNUMBER(x)

Tests *x* for a value. If *x* is a value, *NA, Error,* or blank, ISNUMBER returns 1 (true). If *x* is a string, a range, a group, or the name of a cell that contains text, ISNUMBER returns 0 (false)

Use ISNUMBER in formulas to avoid the special values *Error* and *NA*

Arguments: *x* can be any logical expression

Examples:

Cell=IF(ISNUMBER(Q1:Sales),Q1:Sales*.15,"No Commission") returns the contents of cell *Q1:Sales* multiplied by .15 if cell *Q1:Sales* contains a value; otherwise, it returns No Commission if Q1:Sales does not contain a value

Related functions: ISSTRING tests for a string

ISSTRING (x)

Tests *x* for a string. If *x* is a string or the name of a cell that contains a string, ISSTRING returns 1 (true). If *x* is a value, *NA, Error,* or blank, ISSTRING returns 0 (false)

Use ISSTRING in formulas to avoid the values *Error* and *NA*

Arguments: *x* can be any logical expression

Examples:

Cell=IF(ISSTRING(Test1:Results),Test1:Results,"Not a string") returns the text in *Test1:Results* if *Test1:Results* contains text. If *Test1:Results* does not contain text, the formula returns Not a string

Related functions: ISNUMBER tests for a value

TRUE

Returns the logical value 1

Use TRUE with functions such as IF and CHOOSE to display 1 (true) if a condition is met

Examples:

Cell=IF(Test:Result1>500,@TRUE,@FALSE) returns 1, when *Test:Result1* contains a value greater than 500

Related functions: FALSE returns the logical value 0

Use this table of functions to quickly look up the uses of Mathematical functions. The functions whose names are followed by an asterisk (*) are add-in functions that you must register before you can use them (see Registering the add-in functions)

Conversions

DECIMAL*: converts a hexidecimal string to a decimal value

HEX*: converts a decimal value to a hexidecimal string

General

ABS: calculates the absolute (positive) value of a value

EXP: calculates the number *e* raised to a specified power

FACT*: calculates the factorial of a value

INT: returns the integer portion of a value

LN: calculates the natural logarithm (base *e*) of a value

LOG: calculates the common logarithm (base 10) of a value

MOD: calculates the remainder (modulus) of two values

RAND: returns a random value from 0 to 1, inclusive

ROUND: rounds a value to a specified number of decimal places

ROUNDDOWN*: rounds a value down to a specified number of decimal places

ROUNDUP*: rounds a value up to a specified number of decimal places

SQRT: calculates the positive square root of a value

Trigonometric

ACOS: calculates the arc cosine of a value

ACOSH*: calculates the arc hyperbolic cosine of a value

ACOTH*: calculates the arc hyperbolic cotangent of a value

ACSCH*: calculate the arc hyperbolic cosecant of a value

ASECH*: calculates the arc hyperbolic secant of a value

ASIN: calculates the arc sine of a value

ASINH*: calculates the arc hyperbolic sine of a value

ATAN: calculates the arc tangent of a value

ATANH*: calculates the arc hyperbolic tangent of a value

ATAN2: calculates the four-quadrant arc tangent of two values

COS: calculates the cosine of an angle

COSH*: calculates the hyperbolic cosine of an angle

COTH*: calculates the hyperbolic cotangent of an angle

CSCH*: calculates the hyperbolic cosecant of an angle

PI: returns the value of π (calculated at 3.14159265358979324)

SECH*: calculates the hyperbolic secant of a value

SIN: calculates the sine of an angle

SINH*: calculates the hyperbolic sine of a value

TAN: calculates the tangent of an angle

TANH*: calculates the hyperbolic tangent of a value

Special

BETA*: calculates the Beta function for two values

ERF*: calculates the error function integrated between lower and upper limits

GAMMA*: calculates the gamma function of a value

DECIMAL(*hexadecimal*)

Converts a hexadecimal value to its signed decimal equivalent. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: *hexadecimal* is a value from 00000000 through FFFFFFFF, entered in double quotes. *hexadecimal* can be up to eight characters long and can contain only numbers from 0 through 9 and letters from A through F. The letters can be either uppercase or lowercase

Notes: Hexadecimal values from 00000000 through 7FFFFFFF correspond to 0 and positive decimal values. Hexadecimal values from 80000000 through FFFFFFFF correspond to negative decimal values

Examples:

Cell=DECIMAL("1A") returns 26

Cell=DECIMAL("FFFFFFFE") returns -2

Related functions: HEX converts decimal numbers to hexadecimals

HEX(*x*)

Converts a decimal number to its hexadecimal equivalent. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: *x* is an integer from -2,147,483,648 through 2,147,483,647. If *x* is not an integer, HEX truncates it to an integer

Notes: Hexadecimal values from 00000000 through 7FFFFFFF correspond to 0 and positive decimal values. Hexadecimal values from 80000000 through FFFFFFFF correspond to negative decimal values

Examples:

Cell=HEX(162) returns A2

Related functions: DECIMAL converts hexadecimal numbers to decimal numbers

ABS(*x*)

Calculates the absolute (positive) value of *x*

Use ABS when you need numbers to be positive -- for example, when you calculate percentage differences between actual and budgeted values -- or when you need to find the absolute difference between values in a list of positive and negative values. Use -ABS to force the result of the calculation to be negative

Arguments: *x* can be any value

Examples:

Cell=ABS(-6.2) returns 6.2

Cell=IF(ABS(Total:Q1)=Total:Q1,Total:Q1,"Overdrawn") returns the contents of *Total:Q1* if *Total:Q1* is positive, and **Overdrawn** if not

EXP(*x*)

Calculates the value of the constant *e* (approximately 2.718282) raised to the power *x*

Arguments: *x* can be any value that is less than or equal to 709

Notes: If *x* is larger than 709, the calculation is too large for Improv to store, and EXP returns *Error.* If *x* is larger than 230, Improv can calculate and store the value of EXP, but cannot display it. Instead, the cell displays asterisks

Examples:

Cell=EXP(-1.25) returns 0.286505

Cell=EXP(1.25) returns 3.490342

FACT(*n*)

Calculates the factorial of *n*. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: *n* can be any positive integer or 0

Notes: The factorial of *n* is equal to the product of all positive integers from 1 to *n*

If *n* is greater than or equal to 1755, the calculation is too large for Improv to store, and FACT returns *Error*. If *n* is greater than or equal to 70, Improv can calculate and store the value of FACT, but cannot display it. Instead, the cell displays asterisks

Examples:

Cell=FACT(0) returns 1

Cell=FACT(5) returns 120, the result of 1*2*3*4*5

INT(*x*)

Returns the integer portion of *x*, without rounding the value

Use INT in calculations that require only the integer portion of values; for example, a calculation of staffing levels

Arguments: *x* can be any value

Notes: If you want to display values as integers but want Improv to calculate the values to their full precision, do not use INT. Instead, use the Style panel to assign the General format with 0 decimal places

Examples:

Cell=INT(35.67) returns 35

Cell=INT(AVG(Units:January..Units:June)) returns 35, if the average for *Units:January..Units:June* is 35.67

Related functions: ROUND, ROUNDDOWN, and ROUNDUP round a value to a specified number of decimal places

LN(*x*)

Calculates the natural logarithm (base *e*) of *x*

Use LN in scientific calculations that require natural logarithms, such as compound growth or loss

Arguments: *x* can be any value greater than 0

Notes: A natural logarithm uses the number *e* (approximately 2.718282) as a base

Examples:

Cell=LN(2) returns 0.693147

Cell=LN(*Result:log1*) returns 2.3025851, if *Result:log1* contains the value 10

Related functions: EXP calculates the number *e* raised to a specified power. LOG calculates the common logarithm (base 10) of a value

LOG(*x*)

Calculates the common logarithm (base 10) of x

Use LOG in any calculation that requires a common logarithm, such as a formula to find a root of a number

Arguments: *x* can be any value greater than 0

Examples:

Cell=10^(LOG(8)/3) returns 2, the cube root of 8

Cell=LOG(Result:log2) returns 1.4313638, if *Result:log2* contains the value 27

Related functions: LN calculates the natural logarithm (base *e*) of a value

MOD(*x,y*)

Calculates the remainder (modulus) of *x/y*

Use MOD to determine the remainder in a calculation or to determine whether a number is even or odd. With a divisor of 2, an even number has no remainder

Arguments:

x can be any value. If *x* is 0, MOD returns 0. The sign (+ or -) of *x* (the dividend) determines the sign of the result

y can be any value. If *y* (the divisor) is 0, MOD returns *Error*

Notes: To calculate the modulus, MOD uses the formula *x*-(*y**INT(*x/y*))

Examples:

Cell=MOD(4,3) returns 1

Cell=MOD(-14,3) returns -2

RAND

Generates a random value from 0 to 1, inclusive. Improv calculates RAND to 15 decimal places. Each time the worksheet recalculates, RAND generates a new random value

Notes: To generate random values in different numeric intervals, multiply RAND by the size of the interval. Use ROUND or INT with the result to create random whole numbers

Examples:

Cell=@RAND returns 0.419501, or any value between 0 and 1

Cell=@RAND*10 returns 6.933674, or any value between 0 and 10

Cell=INT(@RAND*50)+1 returns 49, or any integer from 1 to 50

ROUND(*x,n*) rounds the value *x* to the nearest decimal place specified by *n*

ROUNDDOWN(*x*,*n*,[type]) rounds the value *x* down to the nearest decimal place specified by *n*. If this function is not available, you must use the ADDINS20.LSS script to register it

ROUNDUP(*x*,*n*,[type]) rounds the value *x* up to the nearest decimal place specified by *n*.If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

x can be any value

n can be any value from -100 to 100, inclusive

If n is	*ROUND, ROUNDDOWN, and ROUNDUP*
Positive	Affect the decimal portion of the number (moving right from the decimal point. For example, if *n* is 2, ROUND rounds to the nearest hundred)
Negative	Affect the integer portion of the number (moving left from the decimal point). For example, if n is -2, ROUND rounds *x* to the nearest hundred
0	Round to the nearest integer

type is an optional argument that you can use when the number you're rounding is negative. *type* is an argument from this table:

If type is	*ROUNDDOWN and ROUNDUP*
0	ROUNDDOWN rounds away from 0. ROUNDUP rounds toward 0. (0 is the default if you omit the type argument)
1	ROUNDDOWN rounds toward 0. ROUNDUP rounds away from 0

Notes: If you want to display values with a specific number of decimal places but want to calculate those values to their full precision, do not use the ROUND functions. Instead, assign the General format and specific number of decimal places

Examples:

Cell=ROUND(134.578,2) returns 134.58

Cell=ROUND(134.578,0) returns 135

Cell=ROUND(134.578,-2) returns 100

Cell=ROUNDUP(134.578,2) returns 134.58

Cell=ROUNDUP(134.578,0) returns 135

Cell=ROUNDUP(134.578,-2) returns 200

Cell=ROUNDDOWN(134.578,2) returns 134.57

Cell=ROUNDDOWN(134.578,0) returns 135.4

Cell=ROUNDDOWN(134.578,-2) returns 100

Related functions: INT truncates a value, discarding the decimal portion

SQRT(*x*)

Calculates the positive square root of *x*

Arguments: *x* can be any positive value or 0

Notes: Use the formula SQRT(ABS(*x*)) to ensure that *x* is a positive value

Examples:

Cell=SQRT(16) returns 4

Cell=SQRT(ABS(-2)) returns 1.41

ACOS(*x*)

Calculates the arc cosine (inverse cosine) using the cosine *x* of an angle. The result of ACOS is an angle, in radians, from 0 to π, inclusive. This represents an angle between 0 and 180 degrees

Arguments: *x* is the cosine of an angle. *x* can be any value from -1 to 1, inclusive

Notes: To convert the result of ACOS to degrees, multiply it by 180/PI

Examples:

Cell=ACOS(SQRT(3)/2) returns 0.523598 (radians)

Cell=ACOS(.5)*180/@PI returns 60(degrees)

Related functions: COS calculates the cosine of an angle. ACOSH calculates the arc (inverse) hyperbolic cosine of an angle

ACOSH(x)

Calculates the arc (inverse) hyperbolic cosine using the hyperbolic cosine *x* of an angle. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: *x* is the hyperbolic cosine of an angle. *x* can be any value greater than or equal to 1

Examples:

Cell=ACOSH(2) returns 1.316958

Related functions: ACOS calculates the arc cosine of a value. COSH calculates the hyperbolic cosine of an angle

ACOTH(*x*)

Calculates the arc (inverse) hyperbolic cotangent using the hyperbolic cotangent *x* of an angle. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: *x* is the hyperbolic cotangent of an angle. *x* can be any value less than -1 or greater than 1

Examples:

Cell=ACOTH(2) returns 0.549306

Related functions: COTH calculates the hyperbolic cotangent of an angle

ACSCH(*x*)

Calculates the arc (inverse) hyperbolic cosecant using the cosecant *x* of an angle. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: *x* is the hyperbolic cosecant of an angle. *x* can be any value other than 0

Examples:

Cell=ACSCH(1.54) returns 0.61068

Related functions: CSCH calculates the hyperbolic cosecant of an angle

ASECH(*x*)

Calculates the arc (inverse) hyperbolic secant using the hyperbolic secant *x* of an angle. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: *x* is the hyperbolic secant of an angle. *x* can be any value greater than 0 and less than or equal to 1

Examples:

Cell=ASECH(0.5) returns 1.316958

Related functions: SECH calculates the hyperbolic secant of an angle

ASIN(*x*)

Calculates the arc sine (inverse sine) using the sine *x* of an angle. The result of ASIN is an angle, in radians, from -π/2 to π/2, inclusive. This represents an angle between -90 and 90 degrees

Arguments: *x* is the sine of an angle. *x* can be any value from -1 to 1, inclusive

Notes: To convert the result of ASIN to degrees, multiply it by 180/@PI

Examples:

Cell=ASIN(1)*180/@PI returns 90 (degrees)

Related functions: SIN calculates the sine of an angle

ASINH(*x*)

Calculates the arc (inverse) hyperbolic sine using the hyperbolic sine *x* of an angle. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: *x* is the hyperbolic sine of an angle. *x* can be any value

Examples:

Cell=ASINH(2) returns 1.443635

Related functions: SINH calculates the hyperbolic sine of an angle. ASIN calculates the arc sine of a value

ATAN(x)

Calculates the arc tangent (inverse tangent) using the tangent *x* of an angle. The result of ATAN is an angle, in radians from -π/2 and π/2, inclusive. This represents an angle between -90 and 90 degrees

Arguments: *x* is the tangent of an angle. *x* can be any value

Notes: To convert the result of ATAN to degrees, multiply it by 180/@PI

Examples:

Cell=ATAN(1) returns 0.785398(radians)

Cell=ATAN(SQRT(3))*180/@PI returns 60(degrees)

Related functions: ATAN2 calculates the arc tangent of the quotient of two values. TAN calculates the tangent of an angle

ATANH(*x*)

Calculates the arc (inverse) hyperbolic tangent using the hyperbolic tangent *x*. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: *x* is the hyperbolic tangent of an angle. *x* can be any value from -1 to 1, exclusive

Examples:

Cell=ATANH(0.544736) returns 0.610865

Related functions: ATAN calculates the arc tangent of a value. ATAN2 calculates the size of an angle whose tangent is y/x. TANH calculates the hyperbolic tangent of an angle

ATAN2(*x,y*)

Calculates the arc tangent using the tangent *y/x* of an angle. The result of ATAN2 is an angle, in radians, from -π to π, inclusive. This represents an angle between -180 and 180 degrees, depending on the sign of *x* and *y*

x	y	ATAN2,(x,y) Results (Quadrant)
Positive	Positive	Between 0 and π/2, inclusive (I)
Negative	Positive	Between π/2 and π, inclusive (II)
Negative	Negative	Between -π and -π/2, inclusive (III)
Positive	Negative	Between - π/2 and 0, inclusive (IV)

Arguments: *x* and *y* can be any values. If *y* is 0, ATAN2 returns 0; if both *x* and *y* are 0, ATAN2 returns *Error*

Notes: To convert the result of ATAN2 to degrees, multiply it by 180/@PI

Examples:

Cell=ATAN2(SQRT(2)/2,SQRT(2)/2) returns 0.785398 (radians)

Cell=ATAN2(SQRT(3)/2,1/2)*180/@PI returns 30 (degrees)

Related functions: ATAN calculates the arc tangent of a value. TAN calculates the tangent of an angle

COS (*x*)

Calculates the cosine of angle *x* measured in radians. The result of COS is a number from -1 to 1, inclusive

Arguments: *x* can be any value from -1.35 x 10 to 1.35 x 10

Notes: To convert from degrees to radians, multiply by @PI/180

Examples:

Cell=COS(.523598) returns 0.866026 (radians)

Cell=COS(45*PI/180)=0.707107 (degrees).

Related functions: ACOS calculates the arc cosine of a value

COSH (*x*)

Calculates the hyperbolic cosine of angle *x.* The result of COSH is a value greater than or equal to 1. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: *x* can be any value from -11354 to 11354

Examples:

Cell=COSH(.523599) returns 1.140238

Related functions: ACOS calculates the arc (inverse) cosine of a value. COS calculates the cosine of an angle

COTH (*x*)

Calculates the hyperbolic cotangent of angle *x.* If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: *x* can be any value except 0

Examples:

Cell=COTH(.523599) returns 2.081283

Related functions: ACOTH calculates the arc (inverse) hyperbolic contangent of an angle

CSCH

Calculates the hyperbolic cosecant of angle *x.* The hyperbolic cosecant is the reciprocal of the hyperbolic sine. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: *x* can be any value except 0

Examples:

Cell=CSCH(.523599) returns 1.825306

Related functions: ACSCH calculates the arc hyperbolic cosecant of a value. SINH calculates the hyperbolic sine of an angle

PI

Produces the value π (calculated at 3.1415...). π is the ratio of the circumference of a circle to its diameter

Examples:

Cell=@PI returns 3.1415926536

Cell=@PI*4^2 returns 50.26548, the area of a circle with a radius of 4

SECH(*x*)

Calculates the hyperbolic secant of *x*. The hyperbolic secant is the reciprocal of the hyperbolic cosine. The result of SECH is a value greater that 0 or less than or equal to 1. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: *x* can be any value

Examples: Cell=SECH(.523599) returns 0.87701

Related functions: ASECH calculates the arc (inverse) hyperbolic secant of a value

SIN(*x*)

Calculates the sine of angle *x*

Arguments: *x* is an angle measured in radians. *x* can be any value from -1.35 x 10 to 1.35 x 10

, exclusive

Notes: To convert from degrees to radians, multiply degrees by @PI/180

Examples:

Cell=SIN(.883) returns 0.772647 (degrees)

Cell=SIN(35*@PI/180) returns 0.573576 (radians)

Related functions: ASIN calculates the arc sine of a value

SINH(*x*)

Calculates the hyperbolic sine of *x*. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: *x* can be any value from -11356 to 11356

Examples:

Cell=SINH(.523599)returns 0.547854

Related Functions: ASINH calculates the arc (inverse) hyperbolic sine of a value. SIN calculates the sine of an angle

TAN(*x*)

Calculates the tangent of angle *x* measured in radians

Arguments: x can be any value representing an angle measured in radians

Notes: To convert from degrees to radians, multiply degrees by @PI/180

Examples:

Cell=TAN(.52) returns 0.572562 (degrees)

Cell=TAN(35*@PI/180) returns 0.700208 (radians)

Related functions: ATAN calculates the arc tangent using the tangent of a angle

TANH(*x*)

Calculates the hyperbolic tangent of angle *x*. The hyperbolic tangent is the ratio of the hyperbolic sine to the hyperbolic cosine. The result of TANH is a value from -1 to 1, inclusive. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: *x* can be any value

Examples:

Cell=TANH(.523599)returns 0.480473

Related Functions: ATANH calculates the arc (inverse) hyperbolic tangent of a value. TAN calculates the tangent of an angle

BETA(*z,w*)

Calculates the beta function. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: *z* and *w* can be any values, except 0 and negative integers

Notes: The results of BETA is accurate to within at least six significant digits

Examples:

Cell=BETA(0.5,0.5) returns 3.141593

Related Functions: GAMMA calculates the gamma function

ERF(*lower-limit, [upper-limit]*)

Calculates the error function integrated between *lower-limit* and *upper-limit*. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

lower-limit is the lower bound for integrating ERF. *lower-limit* can be any value

upper-limit is an optional argument that specifies the upper bound for integrating ERF. *upper-limit* can be any value. If you omit the *upper-limit* argument, ERF integrates between 0 and *lower-limit*

Notes: ERF approximates the error function to within .

Examples:

Cell=ERF(0.7) returns 0.677801

Cell=ERF(0.8) returns 0.74210

Cell=ERF(0.7,0.8) returns 0.0643, the difference between the previous examples

GAMMA(*x*)

Calculates the gamma function. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments *x* can be any value except 0 and negative integers

Notes: GAMMA approximates the gamma distribution accurately to within six significant digits

Examples:

Cell=GAMMA(0.5) returns 1.772454

Cell=GAMMA(5) returns 24

Related functions: BETA calculates the beta function

Use this table of functions to quickly look up the uses of the Select functions

SELECT: returns a value or string that meets specified criteria
SELECTAVG: averages values that meet specified criteria
SELECTCOUNT: counts the nonblank cells that meet specified criteria
SELECTMAX: finds the largest value that meets specified criteria
SELECTMIN: finds the smallest value that meets specified criteria
SELECTSTD: calculates the population standard deviation of the values that meet specified criteria
SELECTSTDS: calculates the sample standard deviation of values that meet specified criteria
SELECTSUM: sums the values that meet specified criteria
SELECTVAR: calculates the population variance of the values that meet specified criteria
SELECTVARS: calculates the sample variance of values that meet specified criteria

SELECT(*value-range, search-range, key-value1 [key-value2,*...])

Retrieves a value or string that meets specified criteria. SELECT searches the *search-range* for the *key-value,* which acts as criteria. When it finds an exact match, SELECT returns the contents of a cell located in the same position in the *value-range*

Use SELECT to retrieve values or text that meet specific criteria -- for example, given a list of employee last names as key-*values*, SELECT retrieves the corresponding employee numbers

Arguments:
key-value can be a list containing any combination of values, text enclosed in double quotes, and names of cells containing values or text, separated by commas or semicolons. *key-value* can also be an item name or range. Note the following about the *key-value:*

- Each *key-value* acts as criteria for the search. If you specify more than one *key-value* in a list, the relationship between them is either *key-value1* or *key-value2.*
- A match occurs when a *key-value* exactly matches a cell in the *search-range*
- If no match occurs between a *key-value* and a cell in the *search-range,* SELECT returns *Error*

search-range is the range that SELECT searches to find a match for a *key-value.* Note the following about the *search-range:*

- You must specify both the name of the item you are searching, as well as the name of the group or category that describes the extent of the search range. For example, in a two-category worksheet, this argument is *row-item-name:column-category* or *column-item-name:row-category*. To specify this argument, you must SHIFT-click an item name and then click a category tile or group name on the opposite axis
- The contents of *search-range* must be unique. If s*earch-range* contains two or more entries that match a *key-value,* SELECT returns *Error*
- The *search-range* and the *value-range* must be the same size and shape and must come from the same worksheet. The *search-range* and *value-range* can refer to the exact same range, or they can differ in one item

value-range is the range containing the values that SELECT selects based on a *key-value* match in the *search-range.* Note the following about the *value-range:*

- You must specify the name of the item containing the data that you want returned by the function, as well as the name of the group or category that describes the extent of the value range. For example, in a two-category worksheet, this argument is *row-item-name:column-category* or *column-item-name:row-category*. To specify this argument, you must click an item name and then SHIFT-click a category tile or group name on the opposite axis
- The *value-range* and the *search-range* must be the same size and shape and must come from the same worksheet. The *value-range* and the *search-range* can refer to the exact same range, or they can differ in one item
- Blank cells in the *value-range* are ignored

Notes: SELECT and LOOKUP differ. Use SELECT when the *key-value* is a value or text and when the match must be exact. Use LOOKUP when *a key-value* is a value and when the match does not have to be exact

Examples: See the *Handbook,* Appendix A

Related functions: LOOKUP returns a value located in a specified cell in a range

SELECTAVG(*value-range, search-range, key-value1, [key-value2,...*])

Calculates the average of the values that meet specified criteria. To do this, SELECTAVG searches the *search-range* for the *key-value,* which acts as criteria. When it finds an exact match, SELECTAVG selects the value in a cell located in the same position in the *value-range.* All values so selected are then averaged

Use SELECTAVG to find the average of values that meet specified criteria -- for example, given a particular month as a *key-value,* SELECTAVG can select and then average sales that occurred in that month

Arguments:
key-value can be a list containing any combination of values, text enclosed in double quotes, and names of cells containing values or text, separated by commas or semicolons. *key-value* can also be an item name or range or the functions TRUE or FALSE. Note the following about the *key-value:*

- Each *key-value* acts as criteria for the search. If you specify more than one *key-value* in a list, the relationship between them is either *key-value1* or *key-value2*
- A match occurs when a *key-value* exactly matches a cell in the *search-range*

search-range is the range that SELECTAVG searches to find a match for a *key-value.* Note the following about the *search-range:*

- You must specify both the name of the item you are searching, as well as the name of the group or category that describes the extent of the search range. For example, in a two-category worksheet, this argument is *row-item-name:column-category* or *column-item-name:row-category*. To specify this argument, you must click an item name and then SHIFT-click a category tile or group name on the opposite axis
- The *search-range* and the *value-range* must be the same size and shape and must come from the same worksheet. The *search-range* and *value-range* can refer to the exact same range, or they can differ in one item
- To make a search more specific, use a logical formula to calculate values in the *search-range.* Then specify either the function TRUE or FALSE as the *key-value*

value-range is the range containing the values that SELECTAVG selects based on a *key-value* match in the *search-range.* Note the following about the *value-range:*

- You must specify the name of the item containing the data that you want returned by the function, as well as the name of the group or category that describes the extent of the value range. For example, in a two-category worksheet, this argument is *row-item-name:column-category* or *column-item-name:row-category*. To specify this argument, you must click an item name and then SHIFT-click a category tile or group name on the opposite axis
- The *value-range* and the *search-range* must be the same size and shape and must come from the same worksheet. The *value-range* and the *search-range* can refer to the exact same range, or they can differ in one item
- Blank cells in the *value-range* are ignored

Notes: Cells in the *value-range* that contain text or are apparently empty but contain space characters have the value 0 if they are selected by SELECTAVG. Consequently, the result of SELECTAVG may not be what you want

If no matches occur between the *key-value(s)* and the *search-range,* SELECTAVG returns *Error*

Examples: See the *Handbook,* Appendix A

Related functions: AVG and PUREAVG calculate the average of the values in a list. GROUPAVG calculates the average of the values in a group or range, but does not include in its calculation cells calculated by other Group functions along the same category

SELECTCOUNT(*value-range, search-range, key-value1, [key-value2,…*])

Calculates the number of non-blank cells that meet specified criteria. To do this, SELECTCOUNT searches the *search-range* for the *key-value,* which acts as criteria. When it finds an exact match, SELECTCOUNT selects the value in a cell located in the same position in the *value-range*. All values so selected are then counted

Use SELECTCOUNT to count the number of entries that meet specified criteria -- for example, given a particular month as a *key-value,* SELECTCOUNT can count the number of checks written in that month

Arguments:
key-value can be a list containing any combination of values, text enclosed in double quotes, and names of cells containing values or text, separated by commas or semicolons. *key-value* can also be an item name or range, or the functions TRUE or FALSE. Note the following about the *key-value:*

- Each *key-value* acts as criteria for the search. If you specify more than one *key-value* in a list, the relationship between them is either *key-value1* or *key-value2*
- A match occurs when a *key-value* exactly matches a cell in the *search-range*

search-range is the range that SELECTCOUNT searches to find a match for a *key-value.* Note the following about the *search-range:*

- You must specify both the name of the item you are searching, as well as the name of the group or category that describes the extent of the search range. For example, in a two-category worksheet, this argument is *row-item-name:column-category* or *column-item-name:row-category*. To specify this argument, you must click an item name and then SHIFT-click a category tile or group name on the opposite axis
- The *search-range* and the *value-range* must be the same size and shape and must come from the same worksheet. The *search-range* and *value-range* can refer to the exact same range, or they can differ in one item
- To make a search more specific, use a logical formula to calculate values in the *search-range*. Then specify either TRUE or FALSE as the *key-value*

value-range is the range containing the values that SELECTCOUNT selects based on a *key-value* match in the *search-range.* Note the following about the *value-range:*

- You must specify the name of the item containing the data that you want returned by the function, as well as the name of the group or category that describes the extent of the value range. For example, in a two-category worksheet, this argument is *row-item-name:column-category* or *column-item-name:row-category*. To specify this argument, you must click an item name and then SHIFT-click a category tile or group name on the opposite axis
- The *value-range* and the *search-range* must be the same size and shape and must come from the same worksheet. The *value-range* and the *search-range* can refer to the exact same range, or they can differ in one item
- Blank cells in the *value-range* are ignored

Notes: If no matches occur between the *key-value(s)* and the *search-range,* SELECTCOUNT returns *Error*

Examples: See the *Handbook*, Appendix A

Related functions: COUNT and PURECOUNT count the non-blank cells in a list. GROUPCOUNT counts the nonblank cells in a group or range, but does not include in its count any cells calculated by other Group functions along the same category

SELECTMAX(*value-range, search-range, key-value1, [key-value2,…*])

Returns the largest value that meets specified criteria

SELECTMIN(*value-range, search-range, key-value1, [key-value2,…*])

Returns the smallest value that meets specified criteria

SELECTMAX (or SELECTMIN) search the *search-range* for the *key-value,* which acts as criteria. When it finds an exact match, SELECTMAX (or SELECTMIN) selects the value in a cell located in the same position in the *value-range.* All values so selected are then evaluated and the largest (or smallest) is returned

Arguments:

key-value can be a list containing any combination of values, text enclosed in double quotes, and names of cells containing values or text, separated by commas or semicolons. *key-value* can also be an item name or range, or the functions TRUE or FALSE. Note the following about the *key-value:*

- Each *key-value* acts as criteria for the search. If you specify more than one *key-value* in a list, the relationship between them is either *key-value1* or *key-value2.*
- A match occurs when a *key-value* exactly matches a cell in the *search-range*

search-range is the range that SELECTMAX (or SELECTMIN) searches to find a match for a *key-value.* Note the following about the *search-range:*

- You must specify both the name of the item you are searching, as well as the name of the group or category that describes the extent of the search range. For example, in a two-category worksheet, this argument is *row-item-name:column-category* or *column-item-name:row-category*. To specify this argument, you must click an item name and then SHIFT-click a category tile or group name on the opposite axis
- The *search-range* and the *value-range* must be the same size and shape and must come from the same worksheet. The *search-range* and *value-range* can refer to the exact same range, or they can differ in one item
- To make a search more specific, use a logical formula to calculate values in the *search-range*. Then specify either TRUE or FALSE as the *key-value*

value-range is the range containing the values that SELECTMAX (or SELECTMIN) selects based on a *key-value* match in the *search-range.* Note the following about the *value-range:*

- You must specify the name of the item containing the data that you want returned by the function, as well as the name of the group or category that describes the extent of the value range. For example, in a two-category worksheet, this argument is *row-item-name:column-category* or *column-item-name:row-category*. To specify this argument, you must click an item name and then SHIFT-click a category tile or group name on the opposite axis
- The *value-range* and the *search-range* must be the same size and shape and must come from the same worksheet. The *value-range* and the *search-range* can refer to the exact same range, or they can differ in one item
- Blank cells in the *value-range* are ignored

Notes: If no matches occur between the *key-value(s)* and the *search-range,* SELECTMAX (or SELECTMIN) returns *Error*

Examples: For examples of SELECTMAX and SELECTMIN, see the *Handbook,* Appendix A

Related functions: MAX and MIN return the maximum and minimum values, respectively, in a list of values. GROUPMAX and GROUPMIN return the largest and smallest values, respectively, in a range or group, but they do not include in their evaluation cells calculated by other Group functions along the same category

SELECTSTD*(value-range, search-range, key-value1, [key-value2,...*])

Calculates the population standard deviation of values that meet specified criteria. Use SELECTSTD to calculate the standard deviation among values that meet specified criteria and represent the entire population -- for example, the degree to which individual scores on a particular test vary from the mean

SELECTSTDS(*value-range, search-range, key-value1, [key-value2,...*])

Calculates the sample standard deviation of values that meet specified criteria. Use SELECTSTDS to calculate the standard deviation among values that meet specific criteria but represent only a sample of the entire population -- for example, a sample of customer survey results

SELECTSTD (or SELECTSTDS) search the *search-range* for the *key-value,* which acts as criteria. When it finds an exact match, SELECTSTD (or SELECTSTDS) select the value in a cell located in the same position in the *value-range.* All values so selected are then included in the standard deviation calculation

For general information on calculating standard deviation using the population and sample methods, see STD

Arguments:
key-value can be a list containing any combination of values, text enclosed in double quotes, and names of cells containing values or text, separated by commas or semicolons. *key-value* can also be an item name or range, or the functions TRUE or FALSE. Note the following about the *key-value:*

- Each *key-value* acts as criteria for the search. If you specify more than one *key-value* in a list, the relationship between them is either *key-value1* or *key-value2.*
- A match occurs when a *key-value* exactly matches a cell in the *search-range*

search-range is the range that SELECTSTD (or SELECTSTDS) searches to find a match for a *key-value.* Note the following about the *search-range:*

- You must specify both the name of the item you are searching, as well as the name of the group or category that describes the extent of the search range. For example, in a two-category worksheet, this argument is *row-item-name:column-category* or *column-item-name:row-category*. To specify this argument, you must click an item name and then SHIFT-click a category tile or group name on the opposite axis
- The *search-range* and the *value-range* must be the same size and shape and must come from the same worksheet. The *search-range* and *value-range* can refer to the exact same range, or they can differ in one item
- To make a search more specific, use a logical formula to calculate values in the *search-range.* Then specify either TRUE or FALSE as the *key-value*

value-range is the range containing the values that SELECTSTD (or SELECTSTDS) selects based on a *key-value* match in the *search-range.* Note the following about the *value-range:*

- You must specify the name of the item containing the data that you want returned by the function, as well as the name of the group or category that describes the extent of the value range. For example, in a two-category worksheet, this argument is *row-item-name:column-category* or *column-item-name:row-category*. To specify this argument, you must click an item name and then SHIFT-click a category tile or group name on the opposite axis
- The *value-range* and the *search-range* must be the same size and shape and must come from the same worksheet. The *value-range* and the *search-range* can refer to the exact same range, or they can differ in one item
- Blank cells in the *value-range* are ignored

Notes: If no matches occur between the *key-value(s)* and the *search-range,* SELECTSTD (or SELECTSTDS) returns *Error*

Examples: For examples, see the *Handbook,* Appendix A

Related functions: STD and STDScalculate the standard deviation of the values in a list. GROUPSTD

and GROUPSTDS calculate the standard deviation of the values in a group or range, but they do not include in their calculations cells calculated by other Group functions along the same category

SELECTSUM(*value-range, search-range, key-value1, [key-value2,...*])

Calculates the sum of values that meet specified criteria. To do this, SELECTSUM searches the *search-range* for the *key-value,* which acts as criteria. When it finds an exact match, SELECTSUM selects the value in a cell located in the same position in the *value-range.* All values so selected are then summed

Use SELECTSUM to find the total of values that meet specified criteria -- for example, given a particular department as a *key-value,* SELECTSUM can select and total the expenses incurred by that department

Arguments:

key-value can be a list containing any combination of values, text enclosed in double quotes, and names of cells containing values or text, separated by commas or semicolons. *key-value* can also be an item name or range, or the functions TRUE or FALSE. Note the following about the *key-value:*

- Each *key-value* acts as criteria for the search. If you specify more than one *key-value* in a list, the relationship between them is either *key-value1* or *key-value2*
- A match occurs when a *key-value* exactly matches a cell in the *search-range*

search-range is the range that SELECTSUM searches to find a match for a *key-value.* Note the following about the *search-range:*

- You must specify both the name of the item you are searching, as well as the name of the group or category that describes the extent of the search range. For example, in a two-category worksheet, this argument is *row-item-name:column-category* or *column-item-name:row-category*. To specify this argument, you must click an item name and then SHIFT-click a category tile or group name on the opposite axis
- The *search-range* and the *value-range* must be the same size and shape and must come from the same worksheet. The *search-range* and *value-range* can refer to the exact same range, or they can differ in one item
- To make a search more specific, use a logical formula to calculate values in the *search-range.* Then specify either the function TRUE or FALSE as the *key-value*

value-range is the range containing the values that SELECTSUM selects based on a *key-value* match in the *search-range.* Note the following about the *value-range:*

- You must specify the name of the item containing the data that you want returned by the function, as well as the name of the group or category that describes the extent of the value range. For example, in a two-category worksheet, this argument is *row-item-name:column-category* or *column-item-name:row-category*. To specify this argument, you must click an item name and then SHIFT-click a category tile or group name on the opposite axis
- The *value-range* and the *search-range* must be the same size and shape and must come from the same worksheet. The *value-range* and the *search-range* can refer to the exact same range, or they can differ in one item
- Blank cells in the *value-range* are ignored

Notes: If no matches occur between *key-value(s)* and the *search-range,* SELECTSUM returns *Error*

Examples: For an example see the *Handbook,* Appendix A

Related functions: SUM calculates a total for the values in a list. GROUPSUM calculates the total of values in a group or range, but does not include in its calculation cells calculated by other Group functions along the same category

SELECTVAR(*value-range, search-range, key-value1, [key-value2,...*])

Calculates the population variance of values that meet specified criteria. Use SELECTVAR to calculate the variance of values that meet specified criteria and represent the entire population -- for example, all sales in a particular division or all salaries in a particular job level

SELECTVARS(*value-range, search-range, key-value1, [key-value2,...*)

Calculates the variance of sample values that meet specified criteria. Use SELECTVARS to calculate the variance among values that meet specified criteria but represent only a sample of the entire population -- for example, a sample of customer survey results

SELECTVAR (or SELECTVARS) searches the *search-range* for the *key-value,* which acts as criteria. When it finds an exact match, SELECTVAR (or SELECTVARS) selects the value in a cell located in the same position in the *value-range.* All values so selected are then included in the calculation

Arguments:
key-value can be a list containing any combination of values, text enclosed in double quotes, and names of cells containing values or text, separated by commas or semicolons. *key-value* can also be an item name or range, or the functions TRUE or FALSE. Note the following about the *key-value:*

- Each *key-value* acts as criteria for the search. If you specify more than one *key-value* in a list, the relationship between them is either *key-value1* or *key-value2*
- A match occurs when a *key-value* exactly matches a cell in the *search-range*

search-range is the range that SELECTVAR (or SELECTVARS) searches to find a match for a *key-value.* Note the following about the *search-range:*

- You must specify both the name of the item you are searching, as well as the name of the group or category that describes the extent of the search range. For example, in a two-category worksheet, this argument is *row-item-name:column-category* or *column-item-name:row-category*. To specify this argument, you must click an item name and then SHIFT-click a category tile or group name on the opposite axis
- The *search-range* and the *value-range* must be the same size and shape and must come from the same worksheet. The *search-range* and *value-range* can refer to the exact same range, or they can differ in one item
- To make a search more specific, use a logical formula to calculate values in the *search-range*. Then specify either the function TRUE or FALSE as the *key-value*

value-range is the range containing the values that SELECTVAR (or SELECTVARS) selects based on a *key-value* match in the *search-range.* Note the following about the *value-range:*

- You must specify the name of the item containing the data that you want returned by the function, as well as the name of the group or category that describes the extent of the value range. For example, in a two-category worksheet, this argument is *row-item-name:column-category* or *column-item-name:row-category*. To specify this argument, you must click an item name and then SHIFT-click a category tile or group name on the opposite axis
- The *value-range* and the *search-range* must be the same size and shape and must come from the same worksheet. The *value-range* and the *search-range* can refer to the exact same range, or they can differ in one item
- Blank cells in the *value-range* are ignored

Examples: See the *Handbook*, Appendix A for examples

Related functions: VAR and PUREVAR calculate the population variance of values in a list. VARS and PUREVARS calculate the sample variance of the values in a list. GROUPVAR and GROUPVARS calculate the variance of the values in a group or range, but do not include in their calculation cells calculated by other Group functions along the same category

Use this table of functions to quickly look up the uses of the Special functions

CELLNAME: returns the name of a specified cell
CHOOSE: finds a specified value or string in a list of values and/or strings
ERR: marks cells that depend on information that is currently wrong
GETCELL: returns the contents of a specified cell
INFO: returns operating system information for the current session
ITEMCOUNT: returns the number of items in a specified category or group
ITEMNAME: returns the name of a specified item
LOOKUP: returns the contents of a cell in a specified range
NA: identifies cells that depend on information that is not available
? and ??: identifies the places of unsupported 1-2-3 add-in @functions in a file you imported

CELLNAME(*category name 1,category name 2, ...*)

Returns as text the name of the current cell in the specified category

Arguments: *category name* can be a category name enclosed in double quotes

Notes: If you rename the category to which *category name* refers, when the worksheet recalculates, CELLNAME returns *Error.* To correct the error, you must manually edit the formula to refer to the renamed category

If you point to create the *category name,* Improv automatically inserts an extra space at the end of the name. You must delete the space and then type a double quote to complete the argument. If you do not delete the space, the formula results in *Error*

Examples: See the *Handbook*, Appendix A

Related functions: GETCELL retrieves the contents of a specified cell

CHOOSE(*x,list*)

Returns the xth value or string from *list*

Arguments:

x can be 0 or any positive integer that is less than or equal to the number of entries in *list* minus 1. *x* is an offset, which is a number that represents an entry's position in *list*. The first entry has the offset number 0, the second entry has the offset number 1, and so on

list is any collection of values, strings, or the names of cells containing values or strings, separated by commas or semicolons

Examples:

Cell=CHOOSE(2,"Old","New","Borrowed","Blue") returns **Borrowed**

Related functions: LOOKUP returns the contents of a cell in a specified range

ERR

Returns the special value *Error.* To enter the special value *Error* into a cell, type the characters @ERR directly into the cell

ERR is seldom used by itself but is often used as an argument with IF to produce the value *Error* when certain conditions exist

Notes: *Error* is a special value that Improv automatically generates to indicate an error in the result of a formula or that you generate with the function ERR. The value *Error* can ripple through formulas: a formula that refers to a cell that contains *Error* results in *Error,* no matter how the value *Error* is generated. When you correct the formula that returns *Error,* the results of dependent formulas also are corrected

The word Error entered as text and the value *Error* are not equivalent in formulas. For example, the formula Cell= Payment:April+34 returns *Error* if *Payment:April* contains *Error,* but returns 34 if *Payment:April* contains the word Error

Examples:

Cell=IF(Audit:Client1>3,@ERR,Audit:Client1) returns *Error,* when the value in *Audit:Client1* is larger than 3

Related functions: The function NA produces the special value *NA*. ISERR tests for the special value *Error*

GETCELL(*worksheet name,cellname*)

Returns the contents of a specified cell

Arguments:

worksheet name can be text that is enclosed in double quotes and that names a worksheet or an empty string ("""), which indicates the current worksheet

cellname can be text enclosed in double quotes or the name of a cell that contains a reference to another cell

Notes: If the specified *cellname* is invalid, GETCELL returns *Error*

If you rename the items to which *cellname* refers, when the worksheet recalculates, GETCELL returns *Error*. To correct the error, you must manually edit the formula to refer to the renamed items

Examples: See the *Handbook*, Appendix A

Related functions: LOOKUP returns the contents of a cell in a specified range. CELLNAME returns the name of a specified cell in a specified category

INFO(*attribute*)

Returns system information for the current session

Use INFO when you need to provide information about the status of Improv to the user for example, to warn that memory is low

Arguments:

attribute is one of the attribute names from the following table. *attribute* can be an attribute name enclosed in double quotes, the name of a cell containing an attribute name, or an expression that returns an attribute name

attribute	INFO returns
directory	The current path
numfile	The number of open worksheets in the current model
osversion	The current operating system version
recalc	The current recalculation mode (either automatic or manual)
release	The release number of Improv
system	The name of the operating system
totmem	The total memory in use by Improv

Examples:

INFO("release") returns Improv 2.0

ITEMCOUNT(*name string*)

Counts the number of items in the specified category or group

Arguments:

name string can be text enclosed in double quotes that names a category or group

Notes: If you specify the name of an item as *name string,* Improv returns 1

If you rename the category or group to which *name string* refers, when the worksheet recalculates, ITEMCOUNT returns *Error.* To correct the error, you must manually edit the formula to refer to the renamed category or group

If you point to create the *name string*, Improv automatically inserts an extra space at the end of the name. You must delete the space and then type a double quote to complete the argument. If you do not delete the space, the formula results in *Error*

ITEMCOUNT differs from COUNT. COUNT counts the number of nonblank cells in a range. ITEMCOUNT counts the number of items in a category or group

Examples: See the *Handbook*, Appendix A

Related functions: COUNT and PURECOUNT count the number of nonblank cells in a list

ITEMNAME(*name string, position*)

Returns the name of the item at a specified position

Use ITEMNAME to refer to an item without calling it by name

Arguments:

name string can be text enclosed in double quotes. *name string* names a group or category

position is an integer greater than or equal to 1. *position* specifies a position within the named category or group. The first item in a group or category is at position 1

Notes: If *name string* refers to a category that contains groups, ITEMNAME returns group names, not the names of items within groups

If you rename the category to which *category name* refers, when the worksheet recalculates, ITEMNAME returns *Error.* To correct the error, you must manually edit the formula to refer to the named category

If you point to create the *name string*, Improv automatically inserts an extra space at the end of the name. You must delete the space and then type a double quote to complete the argument. If you do not delete the space, the formula results in *Error*

Examples: See the *Handbook*, Appendix A

LOOKUP(*key-value,search-range,value-range*)

Searches a range for a particular value and when it finds a match, returns the contents of a cell located in the same position in another range. A match occurs when the *key-value* is equal to a value in the *search-range* or less than the next value in the *search-range*

LOOKUP is useful for retrieving values from tables, such as tax tables or sales commission tables

Arguments:

key-value can be any value that is equal to or greater than the first value in the *search-range*

search-range is the range that LOOKUP searches to find a match for the *key-value.* Note the following about the *search-range:*

- The values in the *search-range* must be sorted in ascending order
- You must specify both the name of the item you are searching, as well as the name of the group or category that describes the extent of the search range. For example, in a two-category worksheet, this argument is *row-item-name:column-category* or *column-item-name:row-category.* To specify this argument, you must click an item name and then SHIFT-click a category tile or group name on the opposite axis

value-range is the range containing the values that Improv returns based on a *key-value* match in the *search-range.* Note the following about the *value-range:*

- The *value-range* must be the same shape as the *search-range*
- The *value-range* and the *search-range* must be the same size and shape and must come from the same worksheet
- The *value-range* and the *search-range* cannot be identical items or ranges
- You must specify both the name of the item containing the values, as well as the name of the group or category that describes the extent of the *value-range.* For example, in a two-category worksheet, this argument is *row-item-name:column-category* or *column-item-name:row-category.* To specify this argument, you must click an item name and then SHIFT-click a category tile or group name on the opposite axis

Notes: LOOKUP and SELECT differ. Use LOOKUP when a *key-value* match is a value and does not have to be exact. Use SELECT when the *key-value* match is either a number or text and must be exact

Examples: See the *Handbook*, Appendix A

Related functions: SELECT returns a value or string that meets specified criteria

NA

Returns the special value *NA,* (not available). To enter the special value *NA* in a cell, type the characters @NA directly into the cell

Use NA when you are building a worksheet that will contain data that is not yet available. Enter the characters @NA into cells where you will eventually enter the data. The formulas that refer to those cells return the value *NA* until you supply the missing data. NA is also useful to determine which formulas depend on a particular cell

Notes: NA has a ripple-through effect on formulas. Any formula that refers to a cell containing the characters @NA returns the value *NA.* When you replace the characters @NA with a value, formulas dependent on the cell no longer return the value *NA*.

The letters NA and the value *NA* are not equivalent in formulas. For example, the formula Cell=Q1:Sales+34 returns *NA* when *Q1:Sales* contains the value *NA*, but equals 34 when *Q1:Sales* contains the letters NA

Examples:

Cell=IF(Years:Timmy>5,@NA,Years:Timmy) returns the value *NA* when the value in *Years:Timmy* is greater than 5

Related functions: ERR returns the special value *Error.* ISNA stops the ripple-through effect of the special value *NA*

? and **??**

Mark the place of an unknown 1-2-3 add-in @function referred to by a formula in a 1-2-3 worksheet that you import

Notes: Some releases of 1-2-3 allow you to use supplemental products called add-ins that provide their own @functions. If you import a worksheet that contains such a function, Improv translates the function's name to ? or ?? and returns the value *NA*

You cannot enter ? or ?? in a formula

Use this table of functions to quickly look up the uses of the Statistical functions. The functions whose names are followed by an asterisk (*) are add-in functions that you must register before you can use them (see Registering the add-in functions)

General

AVG: averages a list of values

COUNT: counts the nonblank cells in a list of values

MAX: returns the largest value in a list of values

MEDIAN*: calculates the median of a list of values

MIN: returns the smallest value in a list of values

PUREAVG*: averages a list of values, ignoring cells cotaining text

PURECOUNT*: counts the nonblank cells in a list of values, ignoring cells containing text

PUREMAX*: returns the largest value in a list of values, ignoring cells containing text

PUREMIN*: returns the smallest value in a list of values, ignoring cells containing text

PURESTD*: calculates the population standard deviation of a list of values, ignoring cells containing text

PURESTDS*: calculates the sample standard deviation of a list of values, ignoring cells containing text

PUREVAR*: calculates the population variance of a list of values, ignoring cells containing text

PUREVARS*: calculates the sample variance of a list of values, ignoring cells containing text

SKEWNESS*: calculates the skewness of values in a list

STD: calculates the population standard deviation of the values in a list

STDS: calculates the sample standard deviation of the values in a list

SUM: sums the values in a list

SUMPRODUCT: multiplies the values in two or more ranges and sums the resulting products

SUMSQ*: sums the squares of a list of values

VAR: calculates the population variance of the values in a list

VARS: calculates the sample variance of the values in a list

Ranking

RANK*: calculates the 1-based rank of a value in a list

Probability

BINOMIAL*: returns information about the binomial distribution

CHIDIST*: returns information about the X2 distribution for a sample

COMBIN*: calculates the number of sequences, without regard to order (combinations), of objects that can be selected from a total number of objects (a binomial coefficient)

FDIST*: Returns information about the *F*-distribution for two samples

NORMAL*: returns information about the normal distribution

PERMUT*: calculates the number of ordered sequences (permutations) of objects that can be selected from a total number of objects

TDIST*: returns information about the Student's *t*-distribution

AVG(*list*)

Calculates the average, or mean, of a *list* of values

PUREAVG (*list*)

Calculates the average of a *list* of values, ignoring all blank cells and cells that do not contain values. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: *list* is any combination of values, the names of cells or ranges containing values, or expressions that return values, separated by commas or semicolons

Notes: AVG includes in its calculation references to blank cells listed individually. AVG does not include in its calculation blank cells in ranges and groups. Cells containing text have the value 0, as do cells that are apparently empty but contain space characters. This means that cells containing text, apparently empty cells, and blank cells listed individually increase the total number of items in *list;* and if *list* contains any of these, the result of AVG may not be what you want

Examples: See the *Handbook*, Appendix A

Related functions: GROUPAVG calculates the average of values in a group or range but does not include in its calculation cells calculated by other Group functions along the same category. SELECTAVG calculates the average of values that match specified criteria

COUNT(*list*)

Counts the number of nonblank cells in *list*

PURECOUNT(*list*)

Counts the number of cells in *list,* counting only those cells that contain values. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

list is any combination of cells, ranges, or groups, separated by commas or semicolons

Notes: COUNT includes in its calculation every cell in *list* that contains an entry (value, string, *Error,* and *NA*). COUNT does not include in its calculation blank cells that occur in a range or group; however, COUNT does include blank cells if you refer to using single-cell names

Examples:

Cell=COUNT(Sales5..Sales11) returns 7, if range *Sales5..Sales11* contains no blank cells

Cell=COUNT(Sales2..Sales3) returns 0, if both *Sales2* and *Sales3* are blank

Cell=COUNT(Sales2..Sales3, Sales5) returns 1, if range *Sales2..Sales3* is blank and whether or not *Sales5* is blank, because *Sales5* is a single-cell name

Related functions: SELECTCOUNT counts the number of non-blank cells that meet specified criteria. ITEMCOUNT counts the number of items in a group or category. GROUPCOUNT counts the number of cells in a group or range but excludes from the count any cells calculated by group functions along the same category

MAX(*list*)

Returns the largest value in *list*

PUREMAX(*list*)

Returns the largest value in a list, ignoring blank cells and cells that do not contain values. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

list can be any combination of values, the names of cells containing values, or expressions that return values, separated by commas or semicolons

Notes: MAX gives cells containing text the value 0 and includes them in the calculation

Examples: See the *Handbook*, Appendix A

Related functions: GROUPMAX returns the largest value in a list, but does not include in its calculation cells calculated by other Group functions along the same category. SELECTMAX returns the largest value that meets specified criteria

MEDIAN (*list*)

Returns the median value in *list*. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

list can be any combination of values, the names of cells containing values, or expressions that return values, separated by commas or semicolons

Notes: If *list* contains an odd number of values, MEDIAN returns the middle value. If *list* contains an even number of values, MEDIAN returns the arithmetic average of the two middle values

Examples:

Cell=MEDIAN(5,12,65,82,9) returns 12

Cell=MEDIAN(5,12,65,82,9,78) returns 38.50

Related functions: AVG and PUREAVG calculate the average of the values in a list

MIN(list)

Returns the smallest value in *list*

PUREMIN(*list*)

Returns the smallest value in a list, ignoring blank cells and cells that do not contain values. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

list can be any combination of values, the names of cells containing values, or expressions that return values, separated by commas or semicolons

Notes: MIN gives cells containing text the value 0 and includes them in the calculation

Examples: See the *Handbook*, Appendix A

Related functions: GROUPMIN returns the smallest value in a list, but does not include in its calculation cells calculated by other group summary functions along the same category. SELECTMIN returns the smallest value that meets specified criteria

STD(*list*)

Calculates the population standard deviation of the values in a list

PURESTD(*list*)

Calculates the population standard deviation of the values in a list, ignoring cells that do not contain values. If this function is not available, you must use the ADDINS20.LSS script to register it

STDS(*list*)

Calculates the sample standard deviation of the values in list

PURESTDS(*list*)

Calculates the sample standard deviation of the values in a list, ignoring cells that do not contain values. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

list can be any combination of values, names of cells containing values, and expressions that return values, separated by commas or semicolons. *list* can also be a range or the name of a group

Notes: Standard deviation measures the degree to which individual values in a list vary from the mean (average) of all values in the list. The lower the standard deviation, the less individual values vary from the mean, and the more reliable the mean. A standard deviation of 0 indicates that all values in the list are equal.

The STD functions use the *n*, or population, method to calculate the standard deviation of population data. The *n* method assumes that the values in *list* are the entire population. If *list* is only a sample of the population, the standard deviation is biased because of errors introduced in taking the sample.

(See the *Handbook*, Appendix A for the formula used to calculate the *n* method)

The STDS functions use the *n-1*, or sample, method to calculate standard deviation of sample population data. To compensate for errors in the sample, the *n-1* method makes the standard deviation slightly larger than the *n* method. A larger standard deviation is less biased by sampling errors, and is thus more accurate. (See the *Handbook*, Appendix A for the formula used to calculate the *n-1* method)

Examples: See the *Handbook*, Appendix A

Related functions: GROUPSTD and GROUPSTDS calculate the standard deviation of the values in a group or range, but do not include in their calculations cells calculated by other Group functions along the same category. SELECTSTD and SELECTSTDS calculate the standard deviation of values that meet specified criteria

SKEWNESS(*range,[type]*)

Calculates the skewness of the values in *range*. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

range is a range that contains values. If *range* contains fewer than three values, SKEWNESS returns *NA*

type is an optional argument from this table:

type	SKEWNESS calculates
0	Population skewness. (0 is the default if you omit the *type* argument)
1	Sample skewness

Notes: Skewness measures the symmetry of a distribution around its mean. Positive skewness indicates a drawn-out tail to the right; negative skewness indicates a drawn-out tail to the left

Examples: See the *Handbook*, Appendix A

Related functions: STD, PURESTD, SELECTSTD, and GROUPSTD calculate the population standard deviation. STDS, PURESTDS, SELECTSTDS, and GROUPSTDS calculate the sample standard deviation. VAR, PUREVAR, SELECTVAR, and GROUPVAR calculate the population variance. VARS, PUREVARS, SELECTVARS, and GROUPVARS calculate the sample variance

SUM(*list*)

Adds the values in *list*

Use SUM to total a series of values. Using a SUM formula is easier and faster than writing a formula that adds individual values together. For example, the formula SUM(Cost1..Cost5) produces the same result as the formula Cost1+Cost2+Cost3+Cost4+Cost5

Arguments:

list can be any combination of values, names of cells that contain values, or expressions that return values, separated by commas or semicolons

Examples: See the *Handbook*, Appendix A

Related functions: GROUPSUM calculates the total of the values in a group or range, but does not include in its calculation values calculated by other Group functions along the same category. SELECTSUM calculates the total of the values that meet specified criteria

SUMPRODUCT(*list*)

Multiplies the values in corresponding cells in multiple ranges and then sums the products

Use SUMPRODUCT when you want to calculate the total of a series of multiplication formulas, instead of calculating the results of individual multiplication formulas

Arguments: *list* is any combination of ranges and groups, separated by commas or semicolons. All the ranges and groups in *list* must be the same size and shape and must contain values

Notes: If the ranges and groups in *list* are columns, SUMPRODUCT multiplies by rows. If the ranges and groups in *list* are rows, SUMPRODUCT multiplies by columns. If each range and group in *list* spans more than one column, SUMPRODUCT multiplies by rows

Cells containing text have the value 0 and are used in the calculation

Examples: See the Handbook, Appendix A

SUMSQ(*list*)

Calculates the sum of the squares of the values in *list*. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: *list* can be any combination of values, names of cells that contain values, or expressions that return values, separated by commas or semicolons

Examples:

Cell=SUMSQ(2,4,6) returns 56

Related functions: SUM adds the values in a list. SUMPRODUCT multiplies the values in corresponding cells in multiple ranges and then sums the products

VAR(*list*)

Calculates the population variance of the values in a list

PUREVAR(*list*)

Calculates the population variance in a list of values, ignoring cells that do not contain values. If this function is not available, you must use the ADDINS20.LSS script to register it

VARS(*list*)

Calculates the sample population variance of the values in a list

PUREVARS (*list*)

Calculates the sample population variance in a list of values, ignoring cells that do not contain values. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: *list* can be any combination of values, the names of cells containing values, or expressions that return values, separated by commas or semicolons. *list* can also be a range or the name of a group

Notes: Variance measures the degree to which individual values in a list vary from the mean (average) of all the values in the list. The lower the variance, the less individual values vary from the mean, and the more reliable the mean. A variance of 0 indicates that all values in the list are equal

The VAR functions use the *n,* or population, method to calculate variance. The *n* method assumes the selected values are the entire population. If the values are only a sample of the population, the variance is biased because of errors introduced in taking a sample. (See the *Handbook*, Appendix A for the formula used to calculate *n* method)

The VARS functions use the *n-1,* or sample, method to calculate variance. To compensate for errors in the sample, the *n-1* method produces a variance that is slightly larger than the *n* method. A larger variance is unbiased by sampling errors, and is thus more accurate.
(See the *Handbook*, Appendix A for the formula used to calculate the *n*-1 method)

Examples: See the *Handbook*, Appendix A

Related functions: GROUPVAR and GROUPVARS calculate the variance of values in a group or range, but they do not include in their calculations cells calculated by other Group functions along the same category. SELECTVAR and SELECTVARS calculate the variance for values that meet specified criteria

RANK(*x,group* or *range,[order]*)

Calculates the size of a value in a range, relative to other values in the range. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

x can be the name of a cell that contains the value whose rank you want to determine

group or *range* is a group or range that contains only values. If any cells in *group* or *range* do not contain values, RANK returns *Error*. *group* or *range* must include *x*

order is an optional argument from this table:

order	RANK sorts range in
0	Descending order (9 to 0) before ranking *x*. (0 is the default if you omit the *order* argument)
1	Ascending order (0 to 9) before ranking *x*

Examples: See the *Handbook*, Appendix A

BINOMIAL(*trials,successes,probability,[type])*

Calculates the binomial probability mass function or the cumulative binomial distribution. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

trials is the number of independent trials. *trials* can be any positive integer

successes is the number of successes in *trials*. *successes* can be any positive integer or 0. *successes* must be less than or equal to *trials*

If *trials* and *successes* are not integer, BINOMIAL truncates them to integers

probability is the probability of success on each trial. *probability* can be any value of 0 to 1, inclusive

type is an optional argument from this table:

type	BINOMIAL calculates
0	The probability of exactly *successes* number of successes. (0 is the default if you omit the *type* argument)
1	The probability of at most *successes* number of successes
2	The probability of at least *successes* number of successes

Notes: BINOMIAL approximates the normal distribution to within

Examples: You randomly select ten cola drinkers to participate in a blind taste test. You give each test participant a glass of cola A and a glass of cola B. The glasses are identical in appearance, except for a code on the bottom to identify the cola. Assuming there is no tendency among cola drinkers to prefer one brand of cola to another, the probability that a test participant prefers cola A is 50%

This formula calculates the probability that exactly 7 out of 10 test participants prefer cola A:

Cell=BINOMIAL(10,7,0.5) returns 11.72%

Related functions: COMBIN calculates the number of combinations. PERMUT calculates the number of permutations

CHIDIST(*x,degrees-freedom,[type]*)

Calculates the chi-square distribution. The chi-square distribution is a continuous, single-parameter distribution derived as a special case of the gamma distribution. Use CHIDIST to test the validity of a hypothesis by comparing the values you observe with those you expect. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: *x* is the value at which to evaluate the chi-square distribution. The value you enter for *x* depends on the value you enter for *type*

If type is	***x* is**
0	The critical value or upper bound for the value of the chi-square cumulative distribution random variable and is a value greater than or equal to 0. (0 is the default if you omit the *type* argument)
1	A probability (significance level) and is a value from 0 to 1

degrees-freedom is the number of degrees of freedom for the sample. *degrees-freedom* is a positive integer. If degrees-freedom is not an integer, CHIDIST truncates it to an integer

type is an optional argument from this table:

type	**CHIDIST calculates**
0	The significance level corresponding to x. (0 is the default if you omit the type argument)
1	The critical value that corresponds to the significance level x

degrees-freedom is the number of degrees of freedom for the sample. *degrees-freedom* is a positive integer. If *degrees-freedom* is not an integer, CHIDIST truncates it to an integer

type is an optional argument from this table:

type	**CHIDIST calculates**
0	The significance level corresponding to *x*. (0 is the default if you omit the *type* argument)
1	The critical value that corresponds to the significance level x

Notes: CHIDIST approximates the chi-square distribution to within . If CHIDIST cannot approximate the result to within 0.0000001 after 100 calculation iterations, CHIDIST returns *Error*

Examples:

Cell=CHIDIST(12.592,6) returns 0.05

Cell=CHIDIST(0.05,6,1) returns 12.59159

Related functions: FDIST returns information about the *F*-distribution for two samples. TDIST returns information about the Student's *t*-distribution

COMBIN(*n,r*)

Calculates the binomial coefficient for *n* and *r*. The binomial coefficient is the number of ways that *r* can be selected from *n,* without regard for order. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

n is the number of values. *n* can be any positive integer or 0

r is the number of values in each combination. *r* can be any positive integer or 0. *r* must be less than or equal to *n*

If *n* and *r* are not integer, COMBIN truncates them to integers

Notes: COMBIN approximates the binomial coefficient to within 3

Examples: A jar contains five marbles, each one a distinct color. You take out three marbles at random. This formula calculates the number of combinations of marbles you could have:

Cell=COMBIN(5,3) returns 10

Related functions: BINOMIAL calculates the binomial probability mass function or the cumulative binomial distribution. PERMUT calculates the number of permutations

FDIST(*x,degrees-freedom1,degrees-freedom2,[type]*)

Calculates the *F*-distribution. The *F*-distribution is a continuous distribution obtained from the ratio of two chi-square distributions, each divided by its number of degrees of freedom. Use FDIST to determine the degree to which two samples vary. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

x is the value at which you want to evaluate the F-distribution. The value you enter for *x* depends on the value you enter for *type*

If type is	**x is**
0	The critical value or upper bound for the value of the F-distribution and is a value greater than or equal to 0. (0 is the default if you omit the *type* argument)
1	A probability and is a value from 0 to 1

degrees-freedom1 and *degrees-freedom2* are the numbers of degrees of freedom for the first and second samples, respectively. *degrees-freedom1* and d*egrees-freedom2* are positive integers

type is an optional argument form this table:

type	**FDIST calculates**
0	The significance level that corresponds to the critical value *x*. (0 is the default if you omit the *type* argument)
1	The critical value that corresponds to the significance level *x*

Notes: FDIST approximates the *F*-distribution to within . If FDIST cannot approximate the result to within 0.0000001 after 100 calculation iterations, the result is *Error*

Examples:

Cell=FDIST(3.07,8,10) returns 0.05

Cell=FDIST(0.05,8,10,1) returns 3.07

Related functions: TDIST returns informaiton about the Student's *t*-distribution. NORMAL calculates the normal distribution

NORMAL(*x,[mean],[std],[type]*)

Returns information about the normal distribution function. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

x is the value at which you want to evaluate the normal distribution. The value you enter for *x* depends on the value you enter for *type*

If type is	**x is**
0	The critical value or upper bound for the value of the normal distribution. (0 is the default if you omit the *type* argument)
1	A probability (significance level) and is a value from 0 to 1

mean is an optional argument that specifies the mean of the distribution. mean is any positive value or 0. If you omit *mean*, NORMAL uses 0

std is an optional argument that specifies the standard deviation of the distribution. *std* is any positive value or 0. If you omit *std*, NORMAL uses 1

type is an optional argument from this table:

type	**NORMAL calculates**
0	Cumulative distribution function. (0 is the default if you omit the *type* argument)
1	The critical value that corresponds to the significance level x

You cannot use an optional argument without using the ones that precede it

Notes: NORMAL approximates the cumulative distribution to within and the inverse cumulative distribution to within

Examples:

Cell=NORMAL(1.96) returns 0.9750

Related functions: FDIST returns information about the *F*-distribution for two samples. TDIST returns information about the Student's *t*-distribution

PERMUT(*n,r*)

Calculates the number of ordered sequences (permutations) of *r* objects that can be selected from a total of *n* objects. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments:

n can be any positive integer or 0

r can be any positive integer or 0. *r* cannot be greater than *n*

if *n* and *r* are not integers, PERMUT truncates them to integers

Notes: PERMUT calculates the number of permutations to within

Examples: Tests scheduled for 9AM, 10AM, and 11AM will be monitored by three of the five department members. This formula calculates the number of possible ways of assigning monitors:

Cell=PERMUT(5,3) returns 60

Related functions: COMBIN calculates the number of combinations

TDIST(*x,degrees-freedom,[type],[tails]*)

Returns information about the Student's *t*-distribution. If this function is not available, you must use the ADDINS20.LSS script to register it

Arguments: The value you enter for *x* depends on the value you enter for *type*

If type is	x is
0	The critical value or upper bound for the value of the cumulative t-distribution random variable and can be any value. (0 is the default if you omit the *type* argument)
1	A probability and can be any value from 0 to 1, inclusive

degrees-freedom is the number of degrees of freedom for the sample. *degrees-freedom* can be any positive integer

type is an optional argument from this table:

type	TDIST calculates
0	The significance level that corresponds to the critical value, x (0 is the default if you omit the type argument)
1	The critical value that corresponds to the significance level, x

tails is an optional argument from this table:

tails	TDIST performs
1	A one-tailed t-test
2	A two-tailed t-test. (2 is the default if you omit the tails argument)

You cannot use an optional argument without using the ones that precede it

Notes: TDIST approximates the cumulative *t*-distribution to within . If TDIST cannot approximate the result to within 0.0000001 after 100 calculation iterations, the result is *Error*

Examples:

Cell=TDIST(2.228,10) returns 0.05

Cell=TDIST(0.05,10,1) returns 2.228

Related functions: FDIST returns information about the *F*-distribution for two samples. NORMAL calculates the normal distribution

Use this table of functions to quickly look up the uses of the String functions. The functions whose names are followed by an asterisk (*) are add-in functions that you must register before you can use them (see Registering the add-in functions)

CHAR: returns the character that corresponds to a code number in the current font set

CODE: returns the code number that corresponds to a character in the current font set

EXACT: returns 1 (true) if two strings are the same and 0 (false) if the strings are different

FIND: returns the position of the first character of one string within another string

LEFT: returns a specified number of characters from the beginning of a string

LENGTH: counts the characters in a string

LOWER: converts all the letters in a string to lowercase

MID: returns a specified number of characters from the middle of a string

N: returns as a value the contents of the first cell in a group or a range

PROPER: converts the first letter of each word in a string to uppercase and the rest to lowercase

REPEAT: duplicates a string a specified number of times

REPLACE: replaces characters in one string with characters from a different string

RIGHT: returns a specified number of characters from the end of a string

S: returns as a string the contents of the first cell in a group or range

STRING: converts a value into a string with a specified number of decimal places

TRIM: removes leading, trailing, or consecutive space characters from a string

UPPER: converts all the letters in a string to uppercase

VALUE: converts a string that looks like a number into a value

CHAR(*x*)

Returns the character that corresponds to *x*

Use CHAR to generate foreign language characters and symbols that are not available on the keyboard. Whether a character prints depends on the capability of your printer

Argument: *x* can be any integer from 0 to 255, inclusive. If *x* is not an integer, CHAR truncates it to an integer

Examples:

Cell=CHAR(163) returns the British pound sign

Cell=CHAR(Test1:Score) returns A when *Test1:Score* contains the value 65

Related functions: CODE returns the code number that corresponds to a character

CODE(*string*)

Returns the code number that corresponds to the first character in *string*

Arguments: *string* can be text enclosed in double quotes or the name of a cell containing text

Notes: If *string* refers to a blank cell or a value, CODE returns *Error.* If *string* contains more than one character, CODE returns the code for the first character

Examples:

Cell=CODE("A") returns 65

Cell=CODE("Boston") returns 66, the code number for B

Related functions: CHAR returns the character that corresponds to a code number from the current font set

EXACT(*string1,string2*)

Compares two strings. If the two strings are identical, EXACT returns 1 (true). If the two strings are not identical, EXACT returns 0 (false)

Arguments: *string1 and string2* are text enclosed in double quotes

Notes: In a formula, EXACT is more precise than the equal operator (=). Unlike the equal operator, EXACT distinguishes between uppercase and lowercase letters, between letters with and without accent marks, and between strings that contain leading or trailing space characters and those that do not

Examples:

Cell=EXACT("ATHENS","Athens") returns 0 (false)

Cell=EXACT("Overdue",Status:Payment1) returns 1 (true), when *Status:Payment1* contains the word **Overdue**

Cell=EXACT("400",400) returns Error, because "400" is a string and 400 is a value

---

FIND(*search-string,lookup-string,start-number*)

Calculates the position in *lookup-string* at which Improv finds the first occurrence of *search-string.* FIND begins searching *lookup-string* at the character in the position indicated by *start-number,* which represents an offset

Use FIND to return a value representing the position of a particular character or group of characters within a string. FIND is also useful when combined with LEFT, MID, RIGHT, or REPLACE to locate and extract or replace text

Arguments:

search-string and *lookup-string* are text enclosed in double quotes or the name of a cell containing text

start-number can be 0 or any positive integer. The leftmost character in *lookup-string* is at *start-number* 0

Notes: FIND returns *Error* if Improv does not find *search-string* in *lookup-string,* if *start-number* is greater than the number of characters in *lookup-string,* or if *start-number* is negative

FIND is case-sensitive and accent-sensitive. For example, FIND will not find the *search-string* "bridge" in the string "CAMBRIDGE"

Examples:

Cell=FIND("P","Accounts Payable",0) returns 9, because P (the *search-string*) is at position 9

LEFT(*string,n*)

Returns *n* characters from the beginning of *string*

Use LEFT to copy part of a string into another cell, starting at the beginning of the string

Arguments:

string can be text enclosed in double quotes

n can be any positive integer or 0. If *n* is 0, the result is an empty string (" "). If *n* is larger than the length of *string,* LEFT returns the entire *string*

Notes: LEFT counts punctuation and space characters

Examples:

Cell=LEFT(Phone number:JSmith,3) returns 617 when *Phone number:JSmith* contains the phone number 617-555-2222 entered as text

Cell=LEFT("Condominium",5) returns **Condo**

Related functions: MID returns characters from the middle of a string. RIGHT returns characters from the end of a string

LENGTH(*string*)

Counts the number of characters in *string*

Use LENGTH with TRIM to find the length of a string without including leading, trailing, or consecutive space characters

Arguments:

string can be text enclosed in double quotes

Notes: LENGTH counts space characters between words

Examples:

Cell=LENGTH("refrigerator") returns 12

Cell=LENGTH(TRIM(" Mr. Jones ")) returns 9, because spaces are not counted

---

LOWER (*string*)

Converts all the letters in *string* to lowercase

Use LOWER when you want the capitalization of text to be consistent throughout a worksheet

Arguments: *string* can be text enclosed in double quotes

Notes: Capitalization affects the order in which Improv sorts text when you choose Worksheet Sort Items. Two identical words may not appear together if their capitalization is different

Examples:

Cell=LOWER("SHARON") returns sharon

Related functions: UPPER converts all letters in a string to uppercase. PROPER converts the first letter of each word in a string to uppercase

MID(*string,start-number,n*)

Copies *n* characters from *string,* beginning with the character at *start-number*

Use MID to extract characters located in the middle of a string

Arguments:

string can be text enclosed in double quotes

start-number can be 0 or any positive integer. The first character in *string* has a *start-number* of 0. If *start-number* is larger than the length of *string,* MID returns an empty string (" ")

n can be any positive integer or 0. If *n* is 0, MID returns an empty string. If *n* is greater than the length of *string,* MID returns all the characters from *start-number* to the end of *string*

Notes: MID counts punctuation and space characters. If you do not know the length of *string,* use a large number for *n*

Examples:

Cell=MID("Daily Account Balance",6,7) returns Account

Related functions: LEFT returns characters from the beginning of a string. RIGHT returns characters from the end of a string

N(*group or range*)

Returns the entry in the first cell of *group* or *range* as a value. If the cell contains text, N returns the value 0

Arguments: *group* or *range* is a group or range

Examples:

Cell=N(Expenses:Jan..Expenses:Feb) returns 855, if *Expenses:Jan* contains the value 855

Cell=N(Expenses:Jan..Expenses:Feb) returns 0, if *Expenses:Jan* is a blank cell or contains text

Related functions: S returns the entry in the first cell of a range as a string. ISNUMBER tests a cell for a value

PROPER(*string*)

Capitalizes the first letter of each word in *string* and converts the remaining letters to lowercase. Use PROPER when you want the capitalization of text to be consistent throughout a worksheet

Arguments: *string* can be text enclosed in double quotes

Notes: Capitalization affects the order in which Improv sorts text when you choose Worksheet Sort Items. Two identical words may not appear together if their capitalization is different

Examples:

Cell=PROPER("RACHEL LEE") returns Rachel Lee

Related functions: LOWER converts all letters in a string to lowercase. UPPER converts all letters in a string to uppercase

REPEAT(*string,n*)

Duplicates *string, n* times

Use REPEAT to repeat any printable character, including special mathematical, graphical, or foreign language symbols

Arguments:

string can be text enclosed in double quotes

n can be any positive integer

Notes: REPEAT duplicates the string as many times as you specify; it is not limited by the current column width

Examples:

Cell=REPEAT("Hello",3) returns HelloHelloHello

REPLACE(*original-string,start-number,n,new-string*)

Replaces or appends *n* characters in *original-string* with *new-string,* beginning at *start-number*

Use REPLACE with FIND to search for and replace a string or to calculate an unknown *start-number*

Arguments:

original-string and *new-string* can be text enclosed in double quotes. If *new-string* is an empty string (""), REPLACE deletes *original-string*

start-number represents the offset number of a character in *original-string. start-number* can be any positive number or 0. The leftmost character in *original-string* is at offset 0. If *start-number* is larger than the length of *original-string,* REPLACE appends *new-string* to *original-string*

n represents the number of characters to remove. *n* can be any positive integer or 0. If *n* is 0, REPLACE appends *new-string* to *original-string.* If *n* equals the number of characters in *original-string, new-string* replaces the entire *original-string*

Notes: REPLACE counts space characters and punctuation

Examples:

Cell=REPLACE("Jane Smith",0,4,"Malcolm") returns Malcolm Smith

Related functions: FIND returns the position of the first character of one string within another string

RIGHT(*string,n*)

Returns the last *n* characters in *string*

Use RIGHT to copy only part of a string into another cell -- for example, to extract last names from strings that include both first and last names. Use RIGHT with FIND when you do not know the exact value for *n* or when *n* may vary

Arguments:

string can be text enclosed in double quotes

n can be any positive integer or 0. If *n* is 0, the result is an empty string ("""). If *n* is larger than the length of *string*, RIGHT returns the entire string

Notes: RIGHT counts space characters and punctuation

Examples:

Cell=RIGHT("Average Daily Balance",7) returns Balance

Cell=RIGHT(January:Sales,5) returns **Quota** when *January:Sales* contains the string **Over Quota**

Related functions: LEFT returns a specified number of characters from the beginning of a string. MID returns a specified number of characters from the middle of a string

S(*group or range*)

Returns the entry in the first cell in *group* or *range* as a string. If the cell contains text, *S* returns that text. If the cell contains a value or is blank, *S* returns an empty string (" ")

Arguments: *group or range* is a group or range

Examples:

Cell=S(Expenses:Housing..Expenses:Car) returns **Rent** if *Expenses:Housing* contains the word Rent

Cell=S(Expenses:Entertainment..Expenses:Car) returns an empty string (""), if *Expenses:Entertainment* is a blank cell or contains a value

Related functions: N returns the entry in the first cell of a range as a value. ISSTRING can determine if a cell contains a string

STRING(*x,n*)

Converts the value *x* into text with *n* decimal places

Use STRING when you need to use a value as text

Arguments:

x can be any value

n can be 0 or any integer from 1 to 15, inclusive

Notes: STRING ignores any formatting characters Improv uses to display the value *x*. For example, if *Cost of Goods:PartA* contains the formatted value $45.23, STRING(Cost of Goods:PartA,2) returns the string 45.23 (without the dollar sign)

Examples:

Cell-STRING(203,3) returns the text 203.000

Cell=STRING(20%,1) returns the text 0.2

Cell=STRING(Customer:Address1,0)&" "& (Customer:Address2) returns the text **78 Lincoln Avenue**, if *Customer:Address1* contains the value 78 and *Customer:Address2* contains the text **Lincoln Avenue**

Related functions: VALUE converts text that looks like a value into a value

TRIM(*string*)

Removes leading, trailing, and consecutive space characters from *string* while preserving single space characters within *string*

Use TRIM to remove unnecessary space characters from text imported from another program

Arguments: *string* can be text enclosed in double quotes

Examples:

Cell=TRIM(" 45 3/8") returns "45 3/8" as text

UPPER(*string*)

Converts all the letters in a string to uppercase

Use UPPER when you want the capitalization of text to be consistent throughout a worksheet

Arguments: *string* can be text enclosed in double quotes

Notes: Capitalization affects the order in which Improv sorts text when you choose Worksheet Sort Items. Two identical words may not appear together if their capitalization is different

Examples:

Cell=UPPER("Account Number") returns ACCOUNT NUMBER

Cell=UPPER(Test:Status) returns WARNING if *Test:Status* contains the word "warning"

Related functions: LOWER converts all letters in a string to lowercase. PROPER capitalizes only the first letter of each word in a string

VALUE(*string*)

Converts a value entered as text to its corresponding numeric value

Arguments: *string* can be text enclosed in double quotes. *string* can resemble a standard number (456.7), a number in scientific format (4.567E2), a mixed number (45 7/8), or a formatted number ($32.85)

Notes: VALUE ignores leading and trailing spaces; however, VALUE returns *Error* when *string* contains space characters that separate symbols from numbers

VALUE returns 0 when *string* is a blank cell or empty string(""). VALUE returns the value *Error* when *string* contains non-numeric characters

You cannot calculate within the *string* argument in VALUE, but you can create a formula with several VALUE functions. For example, the formula Cell=VALUE("22"+"20") returns 0, but the formula Cell=VALUE("22")+VALUE("20") returns 42

Examples:

Cell=VALUE("543") returns the value 543

Cell=VALUE(Tasks:Completed) returns the value 49.75, if *Tasks:Completed* contains 49.75 entered as text that is, preceded by double quotes

Cell=VALUE("85%") returns .85

Related functions: STRING converts a value into text with a specified number of decimal places

Command	Action
Run	Controls the current script.
Record into Script	Runs the current script. Adds recorded information to the end of the current script.
Attach...	Attaches the current script to a menu item, key, or graphic

Related Commands	Action
Tools Run Script...	Runs your choice of any Improv script.
Tools Attach Script...	Attaches the specified script to a menu item, key, or graphic

Tip **Procedure**

Runs the current script in the active script window

Procedure

Allows you to

- make edits to a script and then run it to see if the changes are correct

See Also

Create Script: to create a script by typing LotusScript code into a new script window

Tools Run Script: to display the Run Script dialog box that lists all the available scripts from which to choose

To run the current script in the active script window

Tip **Procedure**

1. Make the script the active window
   The Improv menu now includes the Script command
2. Choose Script Run
   Improv runs the current script

See Also

Create Script: to create a script

Window Browser: to name and display the script in a model

Adds the information that you record to the end of the active script

Procedure

Allows you to

- update an existing script by recording a command execution. Once the information is added to the script, you can use cut and paste to move it

See Also

Create Script: to capture keystrokes into a script

Script Attach: to attach the current script to a menu item, keystroke combination, or graphic, or to run the script when the model opens

Script Run: to run the current script

Add the information that you record to the end of the active script

Tip **Procedure**

1. Make a script window the current window
2. Choose Script Record into Script
3. Record the keystrokes
4. Choose Script Stop Recording

See Also

Script Attach: to attach the current script to a menu item, keystroke combination, or graphic, or to run the script when the model is opened

Create Script: to create a script by entering commands into a new script window

Attaches the current script to a menu item, keystroke combination, or graphic, or runs the script when the model is opened

Procedure

Allows you to

- customize your model with specialized action created by a script

See Also

Tools Attach Script: to display a list of scripts that you can choose to attach

Editing an icon: to specify icon size

To control where the current script is to be attached in the current model

Tip **Procedure**

1. Select the script you want to attach to a menu item, keystroke, or graphic, or to run when a specific model is opened

   Select an existing script from the Browser (Window Browser), or create a new script (Create Script)

2. Choose Script Attach...

   Improv displays the Attach Script dialog box. The name of the current file and script appear automatically. This script will be attached

3. Choose how you want the script attached

   Add as menu choice: check the box and type in the name of the menu item. The name you enter appears at the bottom of the Tools menu

   Attach to keystroke: Ctrl+: check the box and type in a letter. To run the script, type Ctrl plus the character. (The script must be attached to a menu choice). If you define a CTRL-key combination that already exists (including accelerators), the new key overrides the existing key (see Help Keyboard for a list of keyboard accelerators)

   Run when model opens: check the box. The next time you open the model, Improv will run the script

   Attach to selected graphic: This option is not available from the Script menu. To attach a script to a graphic (such as a button), use Tools Attach Script

4. Click OK to attach the script as specified

See Also

Tools Attach Script: to attach a selected script to a menu item, key, or graphic, or to run when the model opens

Editing an icon: to attach a library script to a custom icon

Create Script: to create a new script

DEFINITIONS

Browser

The Browser contains a list of the worksheets, views, presentations, and scripts in the current model

Chart

A chart allows you to present data graphically. Charts are displayed and saved in a presentation window. A presentation can also contain various objects such as text boxes, ovals, and buttons attached to scripts

Category

A category names a collection of items. When you name a category, you clarify how you've organized your information. For example, a category you name "Products" can contain items such as "Baubles," "Bangles," and "Beads"

Cell

A cell is used to store and display calculated or manually entered data. A cell is uniquely identified by the intersection of two or more items in the worksheet

Data Pane

The data pane displays categories, items, and their cells

Formula

You create formulas in the formula pane of the worksheet. Formulas use the item names to refer to the cells. One formula can calculate the values for many cells, which makes formulas general. For example:

Profit = Sales - Expenses

where the left hand side specifies the cell or cells whose values you want to calculate; the right side calculates the values

Formula Pane

The formula pane is a separate pane at the bottom of the worksheet where you create, edit, and display formulas. Each formula appears on a separate, numbered line

Group
A group consists of one or more contiguous items collected together under one common name

Help Always on Top

To keep Help on display as you work:

- choose Help Always on Top from the Help commands

Improv Model

An Improv model consists of one or more worksheets saved together in a single file. A model can also include different views of worksheets, presentations, and scripts

The contents of a model are displayed in the Browser (Window Browser)

Item

An item is a named unit of information. Items uniquely identify the cells in the data pane and are used in formulas to refer to cells

Model Name

The name of a model appears at the top of the worksheet. Included is the worksheet name, view name, and file name. To rename the worksheet or a view, use the Browser (Window Browser)

Page Area

The page area is one of the category areas. You can click and drag a category tile to the page area, then click the up and down arrows to display each of the items in the category

Resize Cursor

The resize cursor controls the dimensions of the data pane and formula pane. Click the resize cursor and drag up or down to shrink or enlarge the data pane area

Scroll Bar

The scroll bar controls the vertical display of information in any Improv window. To display the hidden parts of a worksheet, presentation, or Help window, click the scroll bar and drag up or down

SmartIcons

SmartIcons are graphical symbols for commonly used commands, such as Cut, Paste, Undo, and Delete. To display the name of the icon and the set to which it belongs, click the right mouse button when the cursor is over one of the SmartIcons

Status Bar

The status bar appears at the bottom of the Improv window

When something is selected in the data pane, formatting information appears in the status bar

When you double-click in the formula pane to enter or edit a formula, Improv displays the formula bar

When a formula is selected and it overlaps other formulas, the status bar displays the Formula Overlap button

Worksheet

A worksheet contains items, cells, and formulas, which represent your data. You can create multiple views of a worksheet, then make changes to individual views to accommodate different uses or different audiences

Summary item

A summary item calculates the total, average, minimum, maximum, count, standard deviation, and custom for a group. A group can have one summary item

View

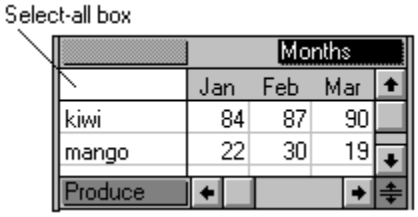
Each view of a worksheet is displayed in a separate window. In a view, you can rearrange, hide, and format items for different views of the same data. Adding or deleting items or data from one view changes the information in all views

EXAMPLES

In Improv, formulas appear in the formula pane at the bottom of the worksheet

Tip **Procedure**

Formula 1 calculates the values of the shaded cells


Select-all box
Months
Jan
Feb
Mar
kiwi
84
87
90
mango
22
30
19
Produce

		Jan
Shirts	silk	84
	linen	22
	cotton	200
	Total	306
Ties		862

		Jan
Shirts	silk	84
	linen	22
	cotton	200
	rayon	120
	Total	426
Ties		862

Tip **Procedure**

Tip **Procedure**

	January	February
kiwi		

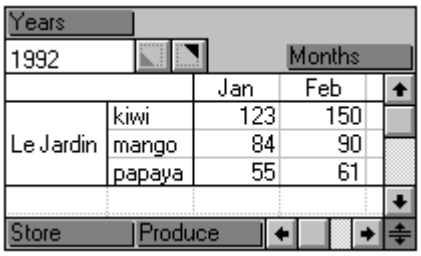
Tip **Procedure**

Click to select an item (kiwi) and its associated cells. Press Enter to add new items

Tip **Procedure**

Tip **Procedure**

The group Fruits contains different varieties of fruit and a Total. The group Vegetables has been collapsed to the single summary item, Total (see Worksheet Collapse Group)



This worksheet contains four categories: Store, Produce, Months, and Years

Tip **Procedure**

Two categories (Months, Produce) keep track of the current year's sales

Tip **Procedure**

Adding another category to handle years allows you to expand and reuse your worksheet

Tip **Procedure**

Tip **Procedure**

Tip **Procedure**

Tip **Procedure**

		1992		
		Jan	Feb	Mar
Le Jardin	kiwi	123	150	
	mango	84	90	
	papaya	55	61	
Eve's	kiwi	38	39	
	mango	52	53	
	papaya	20	18	

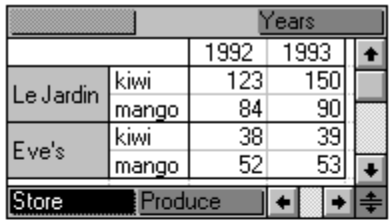
Store	Produce
✓ 1	:1993 = :1992 * 1.2
2	1992:Eve"s:Mar:kiwi = 42

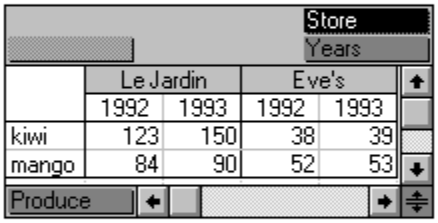
InfoBox

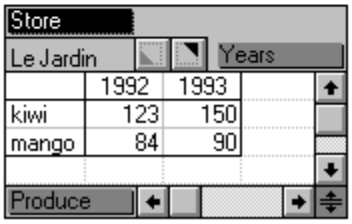
Tip **Procedure**

Rearranging categories

Here's the same worksheet with three different arrangements of the categories. Simply by clicking a category tile (in this case, Store) and dragging it to a new location, you get a different look at the same data







Editing text

Tip **Procedure**

Double-clicking a category title ("Month" in this example) allows you to edit the name

Tip **Procedure**

Double-click a formula and move the cursor where you want to edit

A new worksheet

Tip **Procedure**

PROCEDURES

Selecting in Improv

Tip Procedure

Select an item in a column

Tip Procedure

Select a row item and its cells

Tip Procedure

Selected formula line

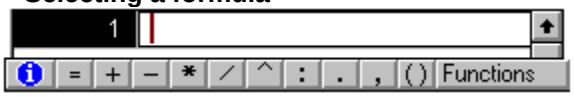
In a conventional worksheet

Tip Procedure

In Improv

Tip Procedure

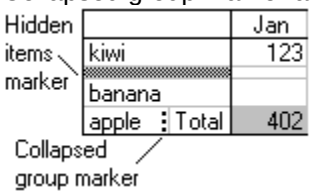
Selecting a formula



When you double-click the formula line, the formula bar appears in the status bar at the bottom of the window. The formula line is highlighted, ready for editing

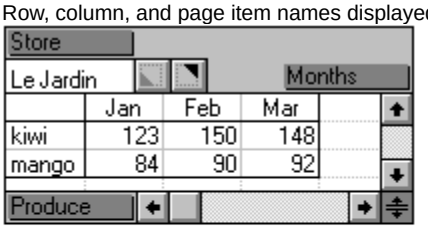
	Arial	9	General	2	$	,	( )	E+	%	Jan:kiwi

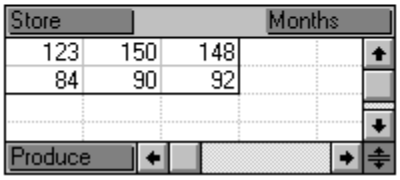
Collapsed group marker and hidden items marker



Row Items, Column Items, Page Items

Row, column, and page item names displayed





Row, column, and page item names hidden

Row item layout

Block style

		Jan
kiwi		123
mango		84
papaya		55
apple	macintosh	222
	delicious	180
	Total	402

Outline style

	Jan
kiwi	123
mango	84
papaya	55
apple	
macintosh	222
delicious	180
Total	402

Worksheet grid

	1992	1993
kiwi	224	246.4
mango	108	118.8
papaya	123	135.3

	1992	1993
kiwi	224	246.4
mango	108	118.8
papaya	123	135.3

If the grid is displayed, you can add items by dragging within the grid

Item and cell grid

Item grid on; cell grid off

	1992	1993
kiwi	224	246.4
mango	108	118.8
papaya	123	135.3

	1992	1993
kiwi	224	246.4
mango	108	118.8
papaya	123	135.3

Item and cell grid off

Vertical and horizontal page breaks

	Jan	Feb	Mar
Fruits	2610	2802	2712
Vegetables	7899	8250	8333

HOW DO I list

How Do I?

How Do I?

Navigate within a model
Assemble an Improv model
Create a chart
Name and annotate using the Browser
Plan an Improv model

How Do I?

Decide between groups and categories
Create new categories
Rearrange categories
Group or ungroup items
Get group totals and summaries
Collapse groups
Expand groups

How Do I?

How Do I?

Select in Improv
Edit my work
Cut, copy, and paste to move data
Delete or clear cell values
Delete elements from a model

How Do I?

How Do I?

Create group calculations
Create a running total
Connect worksheets using formulas
Connect applications using linked formulas
Use Improv functions
Use the Select functions

How Do I?

Rearrange my data
Create a new view of my data
Hide and show information
Collapse groups
Restrict formatting to the current view
Create a data entry view

How Do I?

Select which elements to format
Select item names only
Select cells only
Restrict formatting to the current view
Assign numeric formats to cells
Change the appearance of text
Change colors and fill patterns
Change line styles
Change default fonts
Resize rows, columns, and more

How Do I?

Control what prints
Create a page break
Specify worksheet layout
Specify presentation or script layout
Print headers and footers
Turn off grid and markers before printing
Preview before printing
Print a worksheet
Send a model via email

How Do I?

How Do I?

Record a script
Write a script
Attach a script
Run a script
Debug a script

How Do I?

How Do I?

Change default settings
Customize SmartIcons
Create a template
Create a suite of templates

Popups

Tip **Procedure**

Two formulas overlap at the intersection of Feb and mango, shown by the change of background

To automatically highlight formulas and their cells, check the settings for Auto-mark calculating formulas and Auto-mark calculated cells on the View and Options pages (Worksheet Settings)

Improv contains a powerful programming language called LotusScript. Using LotusScript, you can do everything from automating simple tasks to using information from custom dialog boxes

To use LotusScript Help

- Choose Script Help from the Help menu, or select a script and press F1 (Help)

See Also

Create Script: to create a script

Lotus Chart makes it easy to create and display numeric data in a chart. You create a default chart from within Improv by selecting worksheet data and using the Create Chart command. Once you create a chart, you can then enhance it using Lotus Chart

See the *Handbook* (chapter 12, *Creating Charts*) for:

- information on creating different types of charts
- examples of charts
- information on how data is assigned in a chart

See Chart Help to learn how to change and enhance charts. To display Chart Help, do one of the following:

- Choose Chart Help from the Help menu
- Select a chart or a chart component and press F1 (Help)

See Also

Create Chart: to create a new chart

Selecting items and their cells: to learn how to select the items you want to chart

Click the command for which you want more information

Jeffrey Anderholm
Scott Andersen
Scott Aziz
Jeffrey Berger
Marji Berkman
Bill Bliss
Christine Bowker
Karen Bradley
Attitude Bunny
Gratitude Bunny
Robert Congdon
Terry Connolly
Sara Cummins
majk
Stephen Dohrmann
Glenn Edelson
Miguel Estrada
Julianne Forgo
Jeanne Heston
Melanie Henriques
Janet Mersfelder Kern
Jim King
Paul Kleppner
Robert Krajewski
Cynthia Rosebud Lahman
Jim Leuper
Jacquelyn Malone
Mary McCarthy
Jim McGarry
Peter Messina
Said Mohammadioun
Robert "Smokey" Montgomery
Brian P. O'Halloran
John O'Loughlin
Allen Olsen
Jim O'Neill
Mrya Orth
Harry Peebles
Clare Rabinow
Rehana Rahman
Chris Reckling
Philip Ritari
Marco Rivero
Joanna Rose
Phyllis Sharon
Robby Shaver, Mayor of Dweeb City
Charles Foster Kane
Nicholas Stamos
J. Matthew Stevens
Cun Yong Tan
Lynda Urgotis
Joan Marie Veilleux
Barbara Walter
Martha Warkentin
Michael Welles
Jerry Wood
Nicole M. Wright
Wai-Ki Yip

Lotus offers a number of different support services designed to provide you with answers to your questions about Lotus products.

If you have not been able to find the answer to your question in the product documentation, in online Help, or in the README files that were provided with your software, please use the support service described below that is most appropriate to your needs.

Automated Support Services

Extended Support Programs

Support for the Hearing Impaired

CompuServe

Lotus provides free automated support 24 hours a day, 7 days a week for users with touch-tone phones.

Interactive Voice Support and Lotus Fax Support

From a touch-tone phone, you may access Interactive Voice Support and Lotus Fax Support by calling **(617) 253-9150. In Canada, call (416) 364-5667**. Interactive Voice Support allows you to choose from a menu of support topics to hear recorded information on:

- Commonly asked technical support questions
- Upgrade information
- Product descriptions and specifications

All information that you listen to is available in a follow-up fax. Also, Lotus FAX Support provides access to a catalog of technical bulletins from which you may select items to be faxed to you.

Remote Automated Support

Using Remote Automated Support, you can download technical information, drivers, demonstration programs, templates, and other items directly to your PC from Lotus' technical support library. To do so, you will need a PC with terminal emulation software and a modem. Call the phone number below that corresponds to the baud rate of your modem:

1200 or 2400 baud	(617) 693-7000
9600 baud	(617) 693-7001
Canada: 1200, 2400, 9600 baud	(416) 364-4941

Extended Support Programs

Support for the Hearing Impaired

CompuServe

Lotus offers Extended Support Programs that provide direct telephone access to Lotus technical support specialists. These services are available from 8:30 A.M. to 8:00 P.M. Eastern time, Monday-Friday, excluding Lotus holidays

In order to best help you, the technical support specialist answering your call will need certain information. Please do the following before you call:

- Be at your computer
- Write down what you were doing when the problem occurred, listing the steps you followed prior to the problem
- Write down the exact text of any error messages that were displayed on your screen
- Be able to describe your question or problem in detail
- If your problem pertains to printing and your printer is working, have a sample printout available

Lotus Prompt Support

The Lotus Prompt Support Program provides personal toll-free access to technical support specialists. To access Lotus Prompt, you will need your unique Lotus PROMPT ID number, which was included on the Lotus Customer Support card included in your package

To use Lotus Prompt, call 1-800-386-8600. In Canada, call 1-800-26-LOTUS (1-800-265-6887). Each time you call, you will be asked for your PROMPT ID number

The first 90 days of Lotus Prompt support are free to registered users. Your membership in the Lotus Prompt support program begins with your first call. After your 90 days of free support has expired, you may continue to receive personal support by purchasing a one year support contract for Lotus Prompt.

For more information o the Lotus Prompt Support Program and for information on corporate support programs, please call 1-800-553-4270. In Canada, call 1-800-26-LOTUS (1-800-265-6887)

900# Telephone Support provides access to Lotus technical support specialists for those individuals who prefer a "pay as you go" option. A charge of $2.00 per minute after the first minute of your call will be reflected on your regular monthly telephone bill. To use the 900# Support, call 1-900-454-9009. (This service is not available in Massachusetts or Canada.)

For more information on the Lotus Prompt Support Program and for information on corporate support programs, please call 1-800-553-4270

Automated Support Services

Support for the Hearing Impaired

CompuServe

You can contact Lotus Customer Support with a Telecommunications Device for the Deaf (TTD) by calling 1-800-457-0909. In Canada, call 1-800-563-1109

Automated Support Services

Extended Support Programs

CompuServe

The Lotus Forum on CompuServe provides you with a world of information on Lotus products. Simply enter **GO Lotus** at any ! prompt. As a preferred Lotus customer, you may become a CompuServe member free by calling 1-800-848-8199 (614-457-0802 if outside the U.S. and Canada) and asking for representative #226

Automated Support Services

Extended Support Programs

Support for the Hearing Impaired
