
Chapter 5 Data Assignments

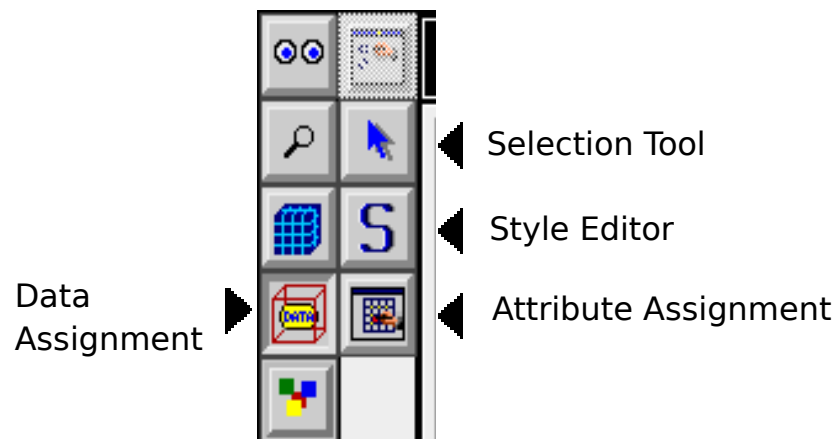
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The following is a description of the data assignment process. The data types must be previously defined using the NCSA DBuilder application. Once defined, the data item can be given a value assigned to any cell in the grid. The assignment is accomplished within the NCSA Mesher application.

Data Assignment

The Data Assignment tools is activated by pressing the Data button in the Primary Tool Palette. Upon activating the assignment button, the Modifier tools that are displayed in the Modifier Palette are Selection Tool, Style Editor, and Attribute Assignment . The top tool in the ModifierPalette (no name) is reserved for later use.

Figure 5.1
Data Assignment
Modifiers



Styles

In NCSA Mesher, data is assigned to the cells of a grid using Styles. A style is a collection of data types (defined by the NCSA DBuilder program) and values for each type. For example, a style may contain a radio cluster (say, Metal Types) and its value (Silver). Styles allows you to group data together and apply that grouping to the cell. This makes the process of editing assigned data much simpler. To change the data assigned to a cell, simply change the values in the style. The modification will be propagated to all the cells containing that particular style.

Creating A Style

To create a style:

1. Select the Style Editor button from the Modifier Palette.
2. NCSA Mesher will display the standard file dialog for you to select the NCSA DBuilder file (see Figure 5.2).
3. Two dialogs will appear. The first is the NCSA DBuilder dialog containing the data types defined by you. The second is the Create Styles dialog (see Figure 5.3).

Figure 5.2
Select NCSA DBuilder File

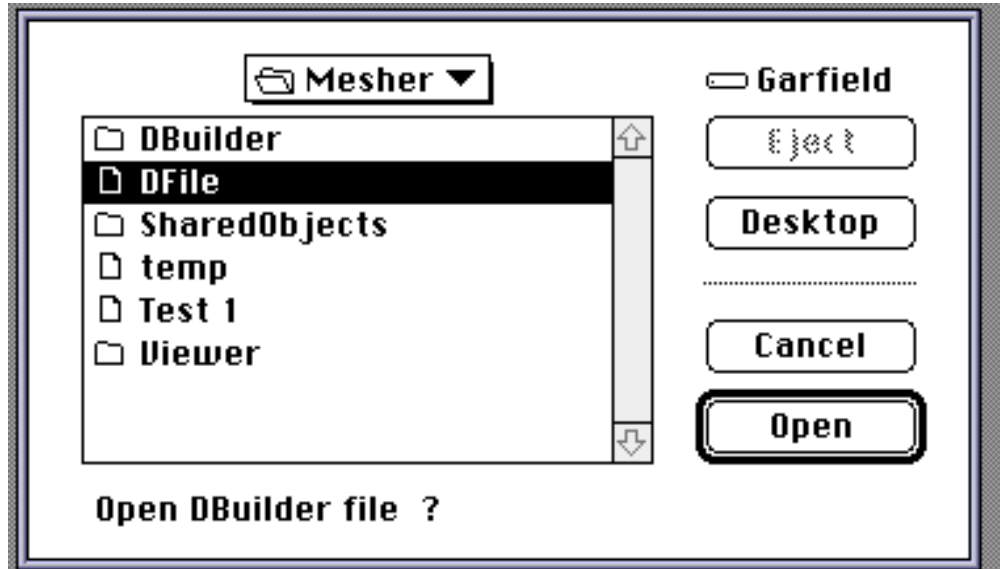
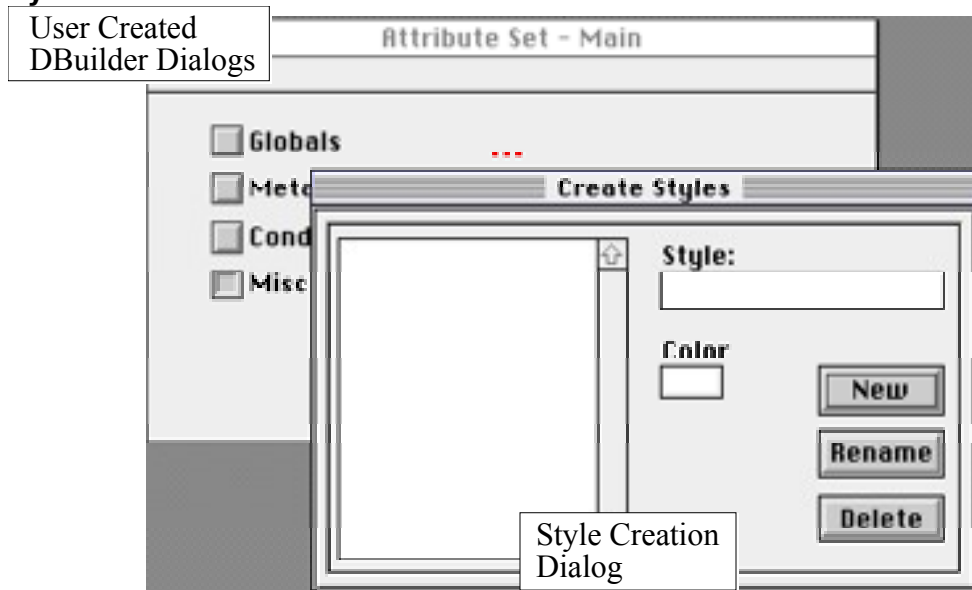


Figure 5.3
Style Dialog Anatomy



Creating a Style Continued....

4. Use the mouse to place the cursor in the Style field box.
5. Type the desired name for the new style. There is a limit of 255 characters for a style name.
6. Use the mouse to click on the New button.
7. The new style name will appear in the scrolling view on the left side of the dialog (see Figure 5.4).

Figure 5.4 Create Styles Dialog

Color

Styles are color coded so that they can be easily distinguished visually from one another. The color is assigned to the style in the Create Style dialog. It is displayed in box below "Color". The default color assigned to a newly created style is white.

Assigning a color to a style:

1. Select a style from the scrolling list on the left side of the Create Styles dialog.
2. The style will appear highlighted and its assigned color will be displayed in the Color box.
3. Use the mouse to click in the Color box.
4. The standard Macintosh color dialog will appear (see Figure 5.5).
5. Use the mouse to click on the desired color or enter the RGB values into the Red, Green and Blue field boxes.

Figure 5.5
Color Dialog

Assigning Data to a New Style

Once a style has been created, data types and values must be attached to it. This is done using the dialogs created by NCSA DBuilder.

Figure 5.6
Add Data to Style

Adding Data to a Style:

1. Bring the NCSA DBuilder dialog forward by clicking with the mouse somewhere inside the NCSA DBuilder window.
2. When the mouse is over a data type, the cursor changes. It takes the shape of an S with a plus sign in the center. This represents Style Add mode (see Figure 5.6).
3. To add the data type to the style with the default value, click on the data prompt. For example, click on the word Metals. This would add the Metal checkbox add its value of Off.
4. To change the value of the data type, enter the new value as you would with any other Machintosh dialog control button. For example, to change Metal from Off to On, click on the checkbox next to the prompt Metal. This will add the Metal type to the current style and assign a value of On.

NCSA DBuilder Subdialogs can be accessed by using the mouse to click on the ellipsis attached to a data item (the ellipsis are the three red dots). This will open the subdialog. Any data item from any subdialog may be added to a style.

Changing the Values for a Data Item**Changing Values for a Type Already in a Style:**

1. Select the Style from the scrolling list on the left side of the Create Styles dialog.
2. Bring the NCSA DBuilder dialog forward by clicking with the mouse somewhere inside the NCSA DBuilder window.
3. Edit the desired data item, giving it the new value.

Deleting Data From a Style

It is often necessary to remove data from a style that has already been created. This procedure is similar to the add process.

Deleting Data From a Style:

1. Select the Style from the scrolling list on the left side of the Create Styles dialog.
2. Bring the NCSA DBuilder dialog forward by clicking with the mouse somewhere inside the NCSA DBuilder window.
3. Hold the option key down. When the mouse is over a data, type the cursor changes. It takes the shape of an S with a minus sign in the center. This represents Style Delete mode (see Figure 5.7).
4. To delete the data type from the current style, hold the option key click on the data prompt. For example, click on the word Metals. This would delete the Metal checkbox from the current style.

Figure 5.7
Delete Data from a Style

Viewing the Data Assigned to a Style

Once Style has been created, the data assigned to it may be viewed using the Finder Style Arrows in the scrolling style list on the left side of the Create Styles dialog box. The arrows are color coded, showing the color assigned to that style.

Using the Style Arrows:

1. Opening a style arrow allows you to view the data.
2. To open a style arrow, use the mouse to click on the arrow. It will change to point down. If the style contains data, that data will be displayed below the style name(see Figure 5.8).
3. To close a style arrow, use the mouse to click on an open arrow. It will change to point to the right.

Figure 5.8
Style Arrows

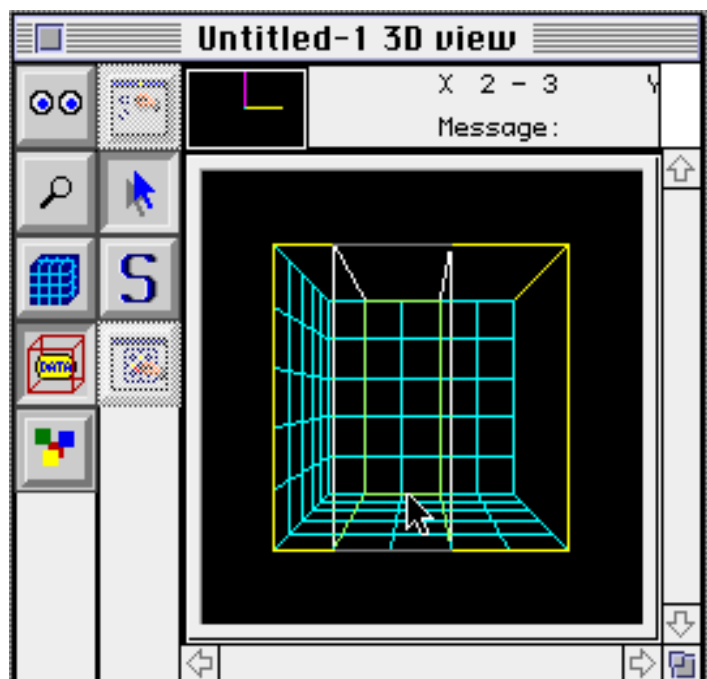
Manipulating Styles

Assigning Styles to a Cell

After the styles have been defined, you can then assign them to the appropriate grid cells. This is accomplished in two steps. Use the Data Button from the Primary Tool Palette. The first step utilizes the Selection Tool from the Modifier Palette. The second uses the Attribute Assignment button from the Modifier Palette (see Figure 5.1).

The Selection Tool operates in the 3D View of the main NCSA Mesher window. It allows you to select a plane(s) of grid cells on which to operate. When the Selection Tool is active, the grid axes are highlighted (see Figure 5.9).

Figure 5.9
Selection Tool



Selecting a Grid Plane

1. Select the Data Button from the Primary Tool Palette and the Selection Tool from the Modifier Palette.
2. Place the arrow over the plane (slice) of cells to assign or modify data input.
3. Click the mouse button on the grid axis to select that plane.
To select more than one continuous plane, hold the mouse button down and drag the cursor in the desired direction.
To select discontinuous planes, hold the shift key down and click on the axis for the next plane.

Clearing the Selections

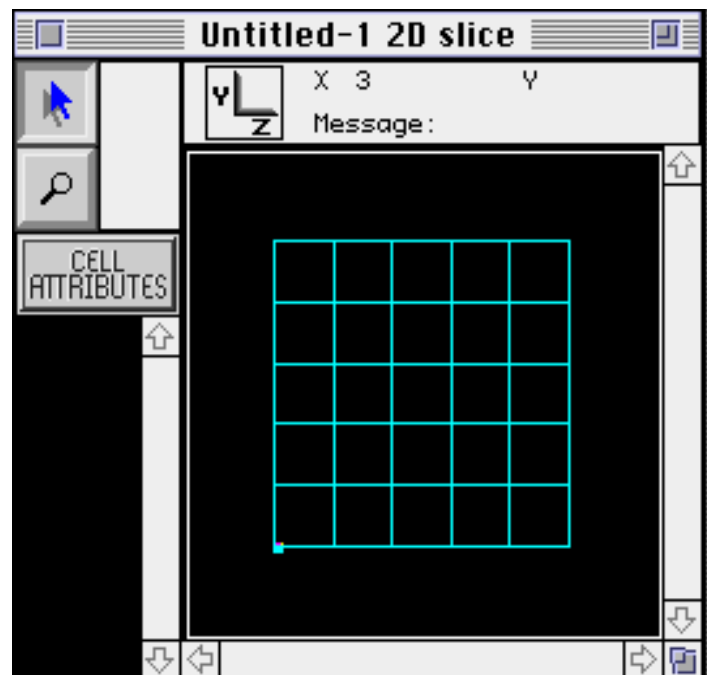
Click anywhere in the 3D View *except* on one of the axes.

After the desired planes have been selected, choose the Attribute Assignment button. This button takes the planes, rotates them, and places them in a window. This window, a 2D view, presents you with a new view of the planes. Effectively, the planes have been flattened out and you are seeing them from the top. Because of the flattening, you see only the top plane in the stack. The others, however, *do* exist below the top plane (see Figure 5.10).

At the top of the window is an Information View. It displays information about the orientation of the plane and the plane number in the X, Y, and Z directions. In addition, there is a message line which displays status and error messages to you.

In the lower left portion of the window is an item called the Stack View. It is located directly beneath the Cell Attributes title box. It is often necessary to display a detailed list of the styles assigned to each cell in a stack of planes. The Stack View displays a color coded representation of the styles within a Cell Stack. In this context, a Cell Stack refers to the pillar of cells formed by taking one cell from each selected plane at the cell location.

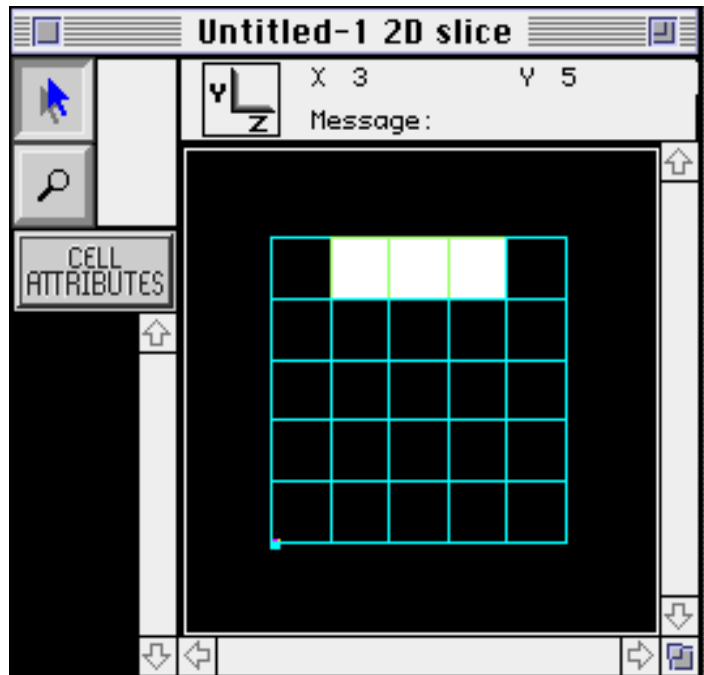
Figure 5.10
2D View of Planes



To Assign a Style:

1. Select a cell(s).
2. Place the mouse over the cells to select. Press the mouse button, hold it down, and drag. The selected cells will be highlighted. Selecting a cell in the top plane selects that same cell in every plane in the stack (see Figure 5.11).

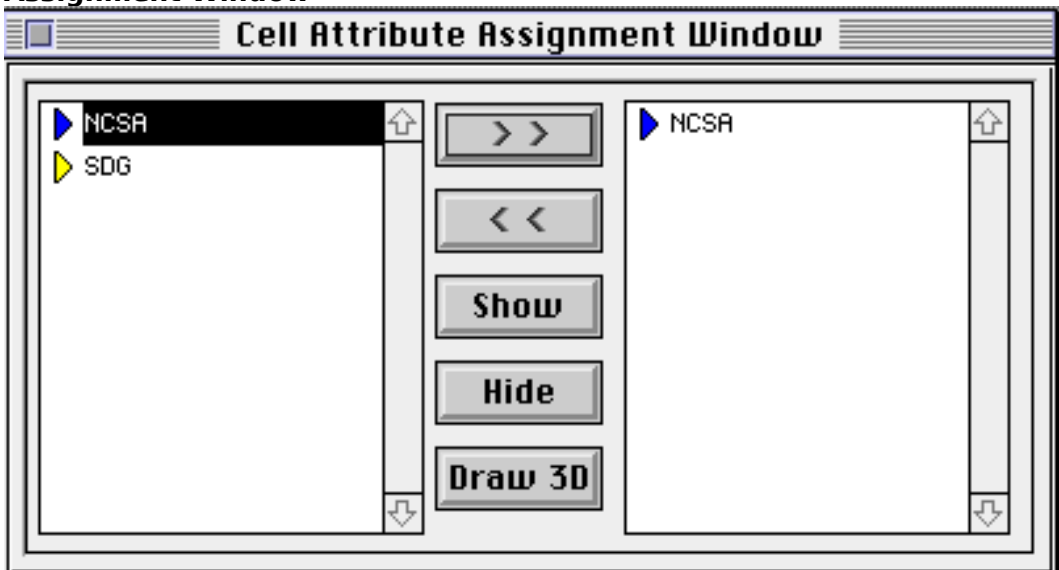
Figure 5.11
Selecting Cells



Assigning Styles continued...

3. A dialog box with all the defined styles will appear (see Figure 5.12).
4. Select the style from the left scrolling list of the Cell Attribute Assignment Window.
5. Press the >> button to make the assignment. The selected style will be added to each select cell in each selected plane.

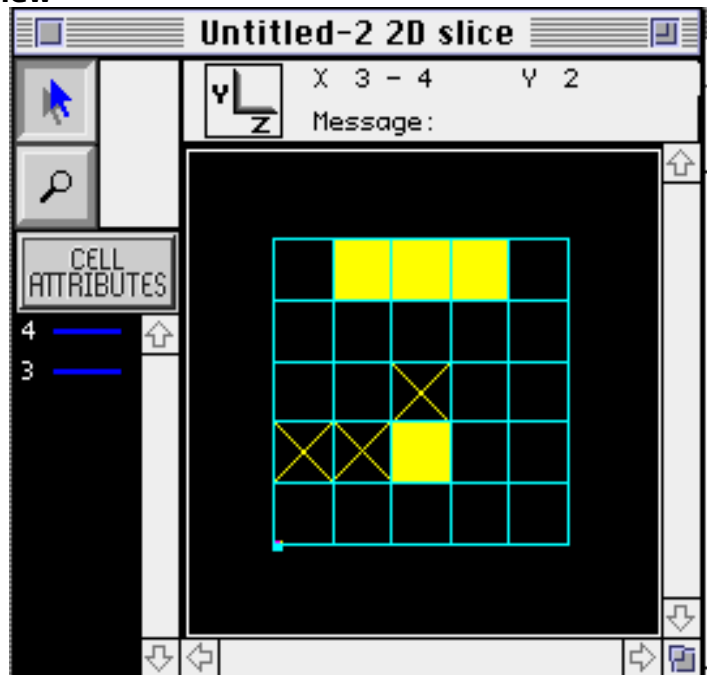
Figure 5.12
Assignment Window



Viewing Styles in the 2D View

You can view the styles assigned to the cells of the selected planes in two ways. First, the Show button displays a style or set of styles by filling in the cells which contain them. The cells appear filled solid when that style or set of styles is present in the cell at that location for each selected plane. If the style or set of styles is present in only some of the cells for that location in the stack of planes, the cell is marked with an X.

Figure 5.13
Displaying Styles in 2D View



To View the Style in the 2D View:

1. Select the desired style from the left scrolling list in the Cell Attribute Assignment Window. If more than one style is desired, hold the option key down and use the mouse to click on the additional styles.
2. Use the mouse to click on the Show button in the Cell Attribute Assignment Window.

The cells which have all the selected styles in each cell in a stack will be filled solid.

The cells which have one or more of the selected styles in one or more of the cells in a stack will be filled with an X.

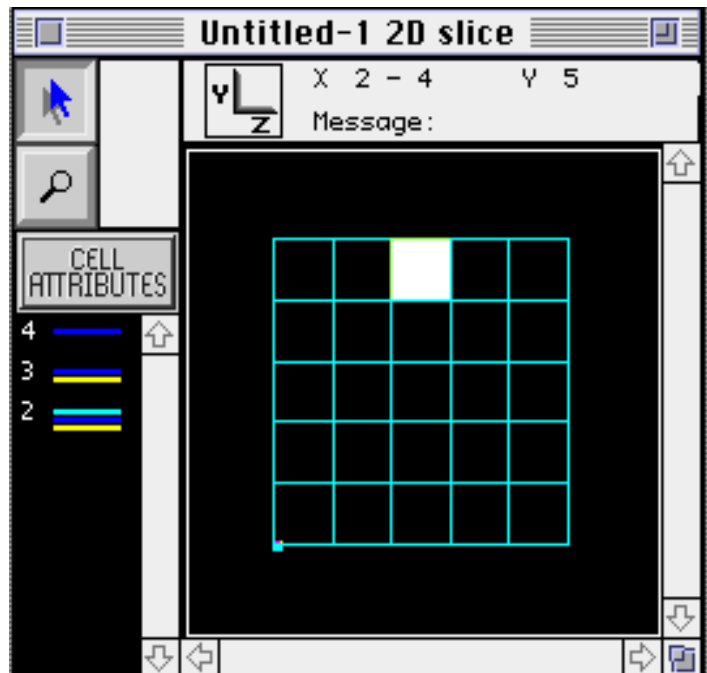
To Clear the Style Display in the 2D View:

1. Use the mouse to press the Hide button in the Cell Attribute Assignment Window.

Stack View

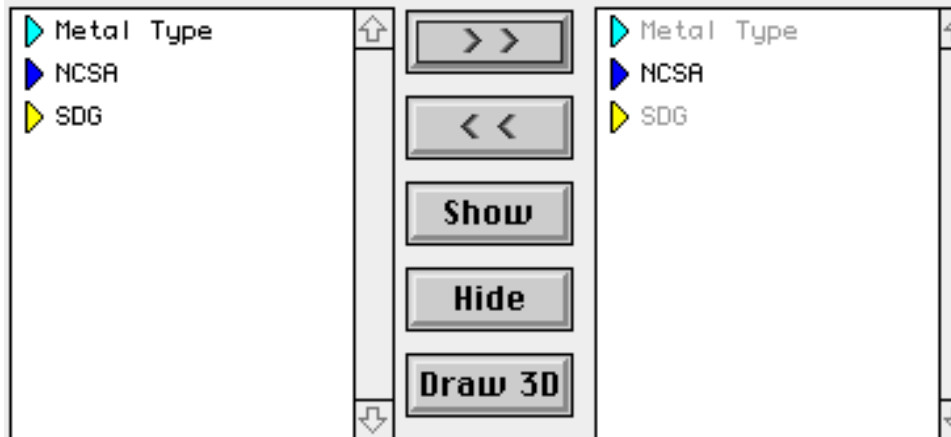
1. The Stack view allows you to display a detailed list of all the styles assigned to each cell in a cell stack.
2. To display the list, use the mouse to click on a single cell in the 2D View.
3. Beneath the Cell Attribute title box, a set of color coded lines will appear for each selected plane. The colors are those chosen by you during style definition to represent a style. If a cell has no assigned styles, a patterned gray line is drawn. The number to the left of the lines report the plane number for that cell (see Figure 5.14).

Figure 5.14
Stack View



While the Stack View is displaying the style information in color coded form, the Cell Attribute Assignment Window displays the style names. When a single cell is selected, the scrolling list on the right side of the Cell Attribute Assignment Window shows all the styles assigned to cells in that cell stack. If a style is present in each cell in the stack, the name appears in black type. If a style is present in *some but not all* the cells in the stack, the style name appears in gray type (see Figure 5.15).

Figure 5.15
Cell Attribute Assignment



Removing Styles From a Cell

It is sometimes necessary to delete a style from a cell. As in assigning styles to cells, this is accomplished in two steps. Use the Data Button from the Primary Tool Palette. The first step utilizes the Selection Tool from the Modifier Palette. The second step uses the Attribute Assignment Button from the Modifier Palette (see Figure 5.1).

Removing a Style:

1. Select the desired grid planes using the Selection Tool (see Assigning Styles to a Cell for more information).
2. Use the Attribute Assignment Button to bring up the 2D View for the selected plane set.
3. Use the mouse to select the desired cell(s).
4. Select the style to delete from the scrolling list on the right side of the Cell Attribute Assignment Window. More than one style can be chosen by holding the shift or option key down and clicking on additional styles.
5. Click on the << button. This will remove the selected style(s) from all the cells in the cell stacks chosen in the 2D View.

Viewing Styles in 3D

It is important to be able to see the relationships between styles. This gives you an overall perspective on the setup of the problem. Viewing styles in the 3D View can be accomplished two ways. First, styles can be displayed in the 3D View as they are being created in the Cell Attribute Assignment Window. Second, styles can be shown using the Data View Button in Primary Tool Palette.

Any time styles are being displayed, the Draw Attributes menu under the Options menu is in effect. Draw Attributes allows you to choose whether the cubes are drawn as solid filled cubes or as wire frame cubes. To change the drawing style, select a new format from the Option - Draw Attributes menu.

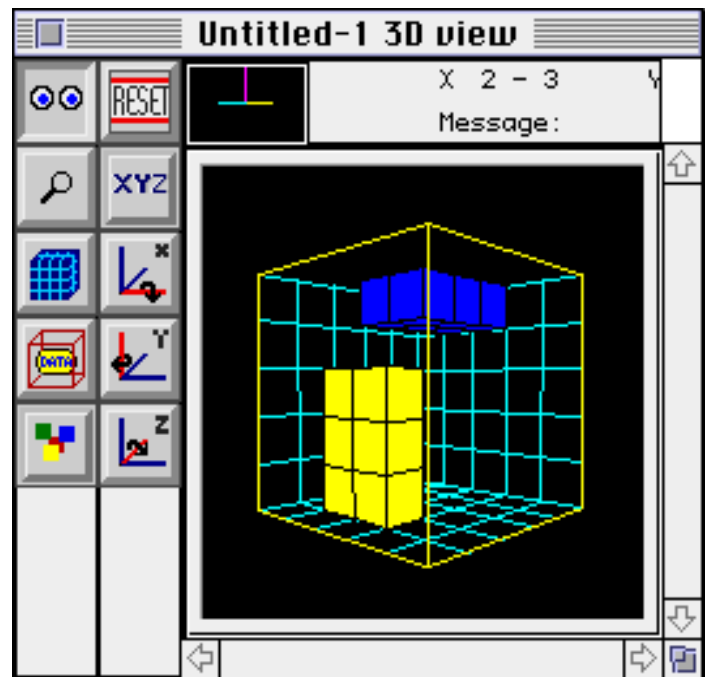
Cell Attribute Assignment Window

To display the styles as they are being created, the Cell Attribute Assignment Window contains a Draw 3D button.

To Display Styles in 3D with the Draw 3D Button

1. The Draw 3D button is in the Cell Attribute Assignment Window. This method of viewing in 3D is most appropriate while assigning or removing styles from a set of cells. Do all the selections as described in Assigning Styles to a Cell.
2. Select the style(s) to display in 3D from the scrolling list on the left side of the Cell Attribute Assignment Window.
3. Use the mouse to click on the Draw 3D button. The selected style(s) are displayed as colored cubes in the 3D View (see Figure 5.16).

Figure 5.16
3D Cubes



Data View Button

The second method of viewing the style data in 3D is through the Data View button in the PrimaryTool Palette. This tool allows you to selectively toggle the display of a style on and off. This is a useful tool in trying to determine the relationships between styles, as well as in seeing how the styles are laid out on the grid.

The Data View button does not have any Modifier Tools. When the button is pressed, the Style Display Window pops up. This window contains a scrolling list of all the defined styles. The boxes to the left of the style name are color coded.

Figure 5.17
Style Display Window



To Display a Style with Data View

1. Click on the Data View button in the Primary Tool Palette. The Style Display Window will pop up onto the screen (see Figure 5.17).
 2. To display a style, click in the box to left of the desired style. A small black square will appear inside the colored box to indicate that this style is being displayed. If there are any cells which contain that style, they will appear in the 3D View as solid filled or wired frame cubes.
 3. To turn the display of a style off, click on the box to the left of the desired style. The small black box will be erased and the 3D View will be redrawn without the removed style.
 4. To display all the styles at once, click on the Show All button in the Style Display Window.
 5. To turn the display of all the styles off, click on the Clear button in the Style Display Window.
6. The Draw 3D button forces the 3D View to redraw without changing the choice of styles being displayed.