

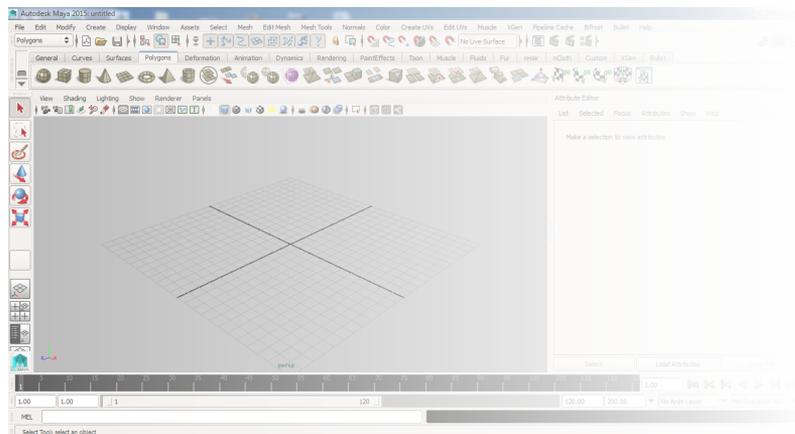
Chapter 1

Exploring Maya Interface

Learning Objectives

After completing this chapter, you will be able to:

- *Start Autodesk Maya 2015*
- *Work with menusets in Autodesk Maya*
- *Understand various terms related to Maya interface*
- *Work with tools in Autodesk Maya 2015*



INTRODUCTION TO Autodesk Maya

Welcome to the world of Autodesk Maya 2015. Maya is a 3D software, developed by Autodesk Inc., which enables you to create realistic 3D models and visual effects with much ease. Although Maya is quite a vast software to deal with, yet all the major tools and features used in Autodesk Maya 2015 have been covered in this book.

STARTING Autodesk Maya 2015

To start Autodesk Maya 2015, choose **All Programs > Autodesk > Autodesk Maya 2015 > Autodesk Maya 2015** from the **Start** menu, refer to Figure 1-1; the default interface of Maya will be displayed with its different components.

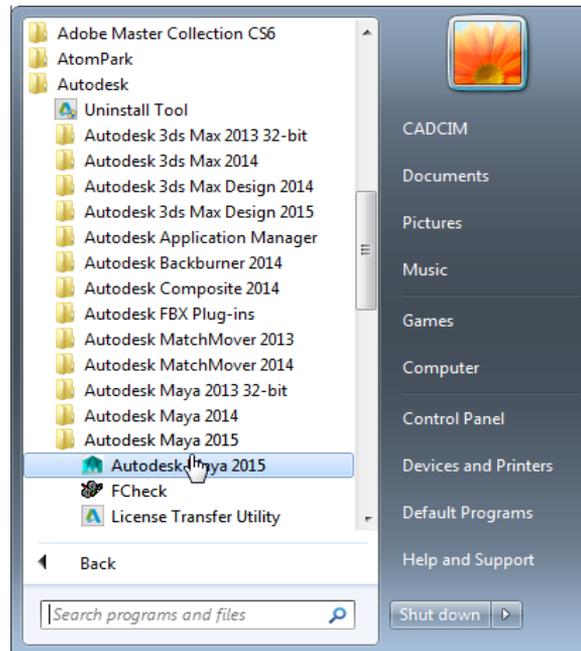


Figure 1-1 Starting Autodesk Maya 2015 using the **Start** menu

Alternatively, you can start Autodesk Maya 2015 by double-clicking on its shortcut icon displayed on the desktop of your computer. This icon is automatically created on installing Autodesk Maya 2015 on your computer. Double-click on the icon; four windows namely, the **Output Window**, the main **Autodesk Maya 2015** interface window, the **1-Minute Startup Movies** window, and the **What's New Highlight Settings** window will be displayed on the screen. The **Output Window**, as shown in Figure 1-2, displays information regarding the version of the **mental ray** renderer that will be used in Autodesk Maya 2015. The **1-Minute Startup Movies** window, as shown in Figure 1-3, provides access to video tutorials that are helpful in learning the basics of Autodesk Maya 2015. By default, all the new tools and icons are highlighted in green in Maya 2015. The **What's New Highlight Settings** window, as shown in Figure 1-4, is used to toggle the visibility of highlights.

```

Output Window

Initialized VP2.0 renderer {
  Version : 5.3.1.100. Feature Level 4.
  Adapter : NVIDIA GeForce GT 610
  Vendor ID: 4318. Device ID : 4170
  Driver : nvoglv64.dll:9.18.13.3523.
  API : OpenGL V.2.
  Max texture size : 16384 * 16384.
  Max tex coords : 8
  Shader versions supported (Vertex: 4, Geometry: 4, Pixel 4).
  Shader compiler profile : (Best card profile)
  Active stereo support available : 0
  GPU Memory Limit : 2048 MB.
  CPU Memory Limit: 11624.8 MB.
}

mental ray for Maya 2015
mental ray: version 3.12.1.12, Feb 1 2014, revision 213714

```

Figure 1-2 The Output Window



Figure 1-3 The 1-Minute Startup Movies window



Note

To play a video tutorial from the **1-Minute Startup Movies** window, choose the button corresponding to it; the video tutorial will be displayed in a separate window. However, if you do not want to play the video tutorials, choose the **Close** button on the upper right corner of the **1-Minute Startup Movies** window. In case you do not want this window to appear the next time you start Autodesk Maya 2015, then clear the **Show this at startup** check box.

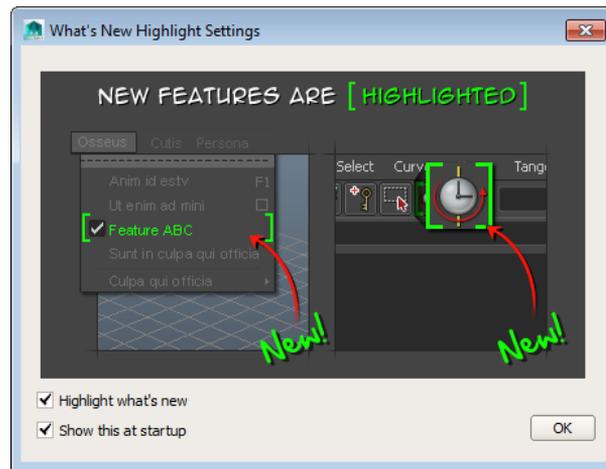


Figure 1-4 The What's New Highlight Settings window



Tip: To view the 1-Minute Startup Movies window again, choose **Help > 1-Minute Startup Movies** from the menubar.

Autodesk Maya 2015 SCREEN COMPONENTS

Autodesk Maya interface consists of viewports, title bar, menubar, Status Line, Shelf, Tool Box, and so on. All these components will be discussed later in this chapter. When you start Autodesk Maya 2015 for the first time, the persp viewport is displayed by default, refer to Figure 1-5.

Workspace is the part of the work area where you can create a 3D scene. Workspaces are also known as viewports or views. In this textbook, the workspaces will be referred to as viewports. Every viewport has a grid placed in the center. The grid acts as a reference that is used in aligning the 3D objects or 2D curves. A grid is a pattern of straight lines that intersect with each other to form squares. The center of the grid is intersected by two dark lines. The point of intersection of these two dark lines is known as the origin. The origin is an arbitrary point, which is used to determine the location of the objects. All the three coordinates, X, Y, and Z are set at 0 position on the origin. Note that in Maya, the X, Y, and Z axes are displayed in red, green, and blue colors, respectively.

Autodesk Maya 2015 is divided into four viewports: top, front, side, and persp. These viewports are classified into two categories, orthographic and isometric. The orthographic category comprises the top, front, and side viewports and the isometric category consists of the persp viewport. The orthographic viewport displays the 2-dimensional (2D) view of the objects created in it, whereas the isometric viewport displays the 3-dimensional (3D) view of the objects created. Every viewport can be recognized easily by its name, which is displayed at the bottom of each viewport. Figure 1-6 shows the screen displaying various components of the Maya interface.

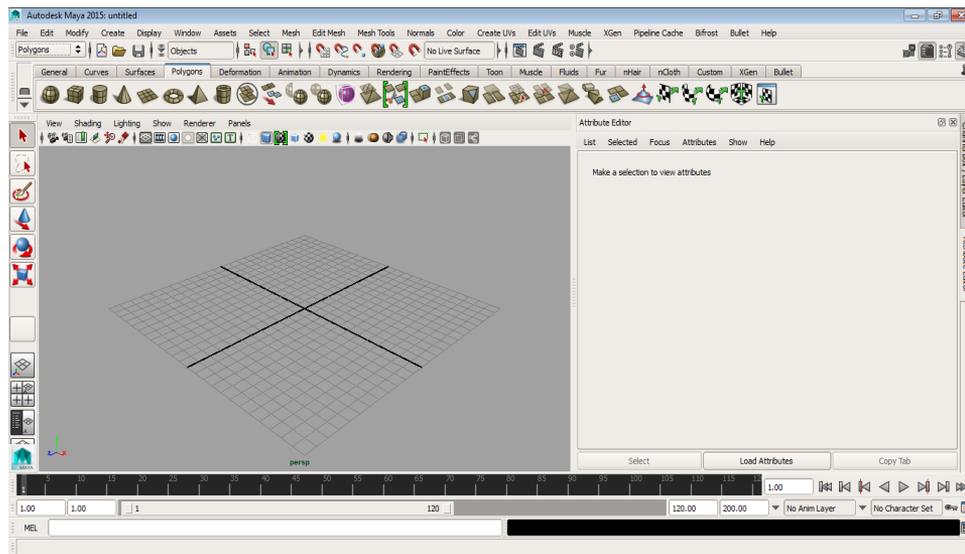


Figure 1-5 The default screen of Autodesk Maya 2015

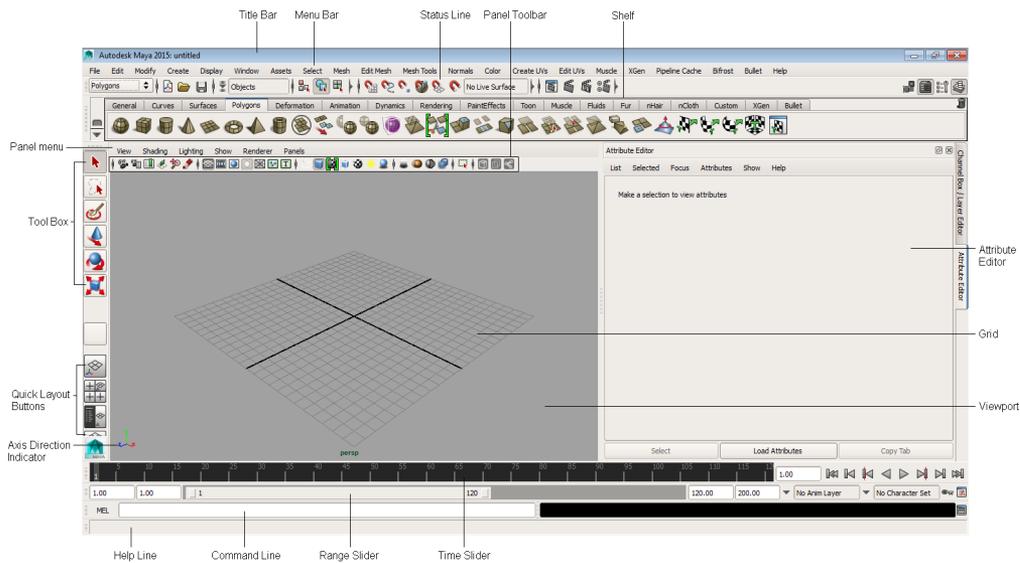


Figure 1-6 Displaying various screen components of the Maya interface

Every viewport has its own **Panel** menu that allows you to access the tools related to that specific viewport. The Axis Direction Indicator located at the lower left corner of each viewport indicates about the X, Y, and Z axes. Similarly, every viewport in Maya has a default camera applied to it through which the viewport scene is visible. The name of the camera is displayed at the bottom of each viewport. In other words, the name of the viewport is actually the name of the camera of that particular viewport.

The title bar, which lies at the top of the screen, displays the name and version of the software, the name of the file, and the location where the file is saved. A Maya file is saved with the *.mb* or *.ma* extension. The three buttons on the extreme right of title bar are used to minimize, maximize, and close the Autodesk Maya 2015 window, respectively. Various interface components of the Autodesk Maya 2015 interface are discussed next.



Tip: To toggle between single viewport and four viewport views, move the cursor over one of the viewport and press the SPACEBAR key.

Menubar

The menubar is available just below the title bar. The type of menubar displayed depends on menusets. In Maya, there are different menusets namely **Animation**, **Polygons**, **Surfaces**, **Dynamics**, **Rendering**, and **nDynamics**. These menusets are displayed in the **Menuset** drop-down list located on the extreme left of the Status Line. On selecting a particular menuset, the menus in the menubar change accordingly. However, there are nine common menus in Maya that remain constant irrespective of the menuset chosen. Figure 1-7 shows the menubar corresponding to the **Polygons** menuset.



*Figure 1-7 Menubar displayed on choosing the **Polygons** menuset*

On invoking a menu from the menubar, a pull-down menu is displayed. On the right of some options in these pull-down menus, there are two types of demarcations, arrows and option boxes. When you click on an option box, a dialog box will be displayed. You can use this dialog box to set the options for that particular tool or menu item. On clicking the arrow, the corresponding cascading menu will be displayed.



Tip: You can also select different menusets using the hotkeys that are assigned to them. The default hotkeys are F2 (Animation), F3 (Polygons), F4 (Surfaces), F5 (Dynamics), and F6 (Rendering).

Status Line

The Status Line is located below the menubar. The **Menuset** drop-down list is located at the left of the Status Line. You can select menusets from this drop-down list. The Status Line consists of different graphical icons. The graphical icons are further grouped and these groups are separated by black vertical lines with either a box or an arrow symbol in the middle. These vertical lines are known as Show/Hide buttons, refer to Figure 1-8. You can click on a Show/Hide button with a box symbol to hide particular icons on the Status Line. On doing so, the corresponding icons will hide and the box will change to an arrow symbol. Similarly, if you click on a Show/Hide button that has an arrow symbol in the middle, the icons of the corresponding group will be displayed. Various groups separated by Show/Hide button are discussed next.



Figure 1-8 The Status Line

Menuset

As mentioned earlier, the **Menuset** drop-down list in the Status Line has different menusets such as **Animation**, **Polygons**, **Surfaces**, **Dynamics**, and **nDynamics**, as shown in Figure 1-9. The options displayed in the menubar depend upon the menuset selected from this drop-down list. For example, if you select the **Rendering** menuset from the **Menuset** drop-down list, all commands related to it will be displayed in the menus of the menubar. You can also select the menusets from the viewport by pressing and holding the h key and then left-clicking in the viewport; a marking menu consisting of different menusets will be displayed.

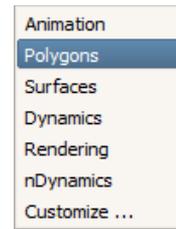


Figure 1-9 The Menuset drop-down list

File buttons Group

The options in this group are used to perform different file related operations, refer to Figure 1-10. The tools in this group are discussed next.

New scene



The **New scene** button is used to create a new scene. To create a new scene, choose the **New scene** button from the Status Line; the **Warning: Scene Not Saved** message box will be displayed with the message **Save changes to untitled scene?**, as shown in Figure 1-11. This warning message will only appear if the current scene is not saved. Choose the **Save** button to save the scene. Choose the **Don't Save** button to create a new scene without saving the changes made in the current scene. Choose the **Cancel** button to cancel the saving procedure.



Figure 1-10 The File buttons Group

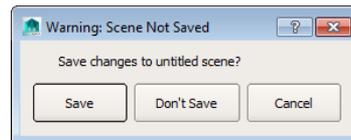


Figure 1-11 The Warning: Scene Not Saved message box

Open scene



The **Open scene** button is used to open a file created earlier. To open an existing file, choose this button from the Status Line; the **Open** dialog box will be displayed, as shown in Figure 1-12. In this dialog box, specify the location of the file that you want to open and then choose the **Open** button; the selected file will open in the Maya interface. This dialog box is divided into different sections and some of them are discussed next.

Folder Bookmarks

The bookmarks section is used to access the folders in your computer. You can also rearrange the default location of the folders in this section by dragging them up and down using the left mouse button.

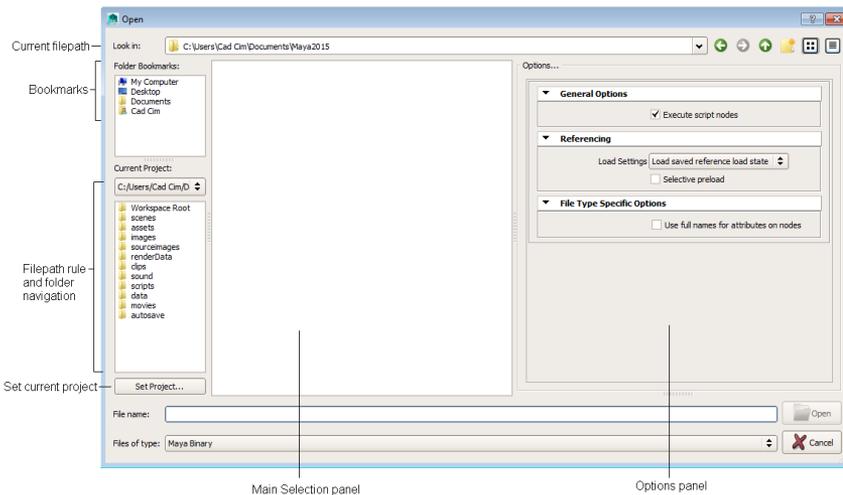


Figure 1-12 The *Open* dialog box

Set project

This button is used to set a new project by replacing the current project. On choosing this button, a new window named **Set Project** is displayed. You will learn about this window later in this book.

Save scene

The **Save scene** button is used to save the current scene. On choosing the **Save scene** button, the **Save As** dialog box will be displayed. Enter a name for the file in the **File name** text box, specify the location to save the current scene, and then choose the **Save As** button to save the current scene. Maya provides you with various options that can be used while saving a file. These options are given on the right side of the dialog box in the **Options** section.

Selection set icons group

The **Selection set icons** group shown in Figure 1-13 is used to define the selection of objects or the components of objects from the viewport. This menu comprises of three buttons that are discussed next.

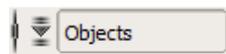


Figure 1-13 The *Selection set icons* group

Select By Hierarchy And Combinations

The **Select By Hierarchy And Combinations** button is used to select a group of objects in a scene in a hierarchical order. For example, if four objects are combined under a single group, clicking on a single object with this button chosen will select the entire group of objects.

Select By Component Type



The **Select By Component Type** button is used to select the components of an object, such as vertices or faces. You can also select the control vertices of the NURBS surfaces using this button.

Select By Object Type



The **Select By Object Type** button is used to select only a single object from a group of objects in a scene. For instance, if four objects are combined under a single group, this button will enable you to select only the desired object from the group, and not the entire group.



Tip: To switch between the object and component modes of the selection type, press the F8 key.

Selection Mask Icons Group

The **Selection Masks Icons** group comprises of selection filters that help you in selecting objects or their components in the viewport. The selection mask helps you decide which filters/icons should be displayed in the viewport. The selection masks icons group depends on the selection mode button chosen. If the **Select By Hierarchy And Combinations** button is chosen, then the icons under this group will change, as shown in Figure 1-14. These icons represent the tools that enable you to select the objects based on their hierarchy. Similarly, on choosing the **Select By Component Type** button and the **Select By Object Type** button, the icons under these groups will change accordingly, and this will enable you to select either the entire object, or its components, refer to Figures 1-15 and 1-16. You can select the required object from a group by using these icons. The most commonly used group is the icons group displayed on choosing the **Select By Object Type** button. Various buttons in this selection masks icons group are discussed next.



Figure 1-14 The Select By Hierarchy And Combinations group displayed on choosing the Select By Hierarchy And Combinations button



Figure 1-15 The Select By Component Type group displayed on choosing the Select By Component Type button



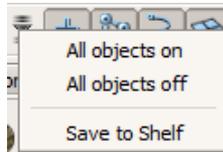
Figure 1-16 The Select By Object Type group displayed on choosing the Select By Object Type button

Set the object selection mask



The **Set the object selection mask** button is used to switch all selection icons on or off. To do so, choose the **Set the object selection mask** button from the Status Line; a flyout will be displayed, as shown in Figure 1-17. Choose the **All objects on** option from

the flyout to make all selection icons on or select the **All objects off** option to switch off all selection icons from the menu.



*Figure 1-17 Flyout displayed on choosing the **Set the object selection mask** button*



Note

*If the **All objects off** option is chosen, you cannot select any object in the viewport.*

Select handle objects



The **Select handle objects** button allows you to select IK handles and selection handles. You will learn more about this tool in the later chapters.

Select joint objects



The **Select joint objects** button is used to select only the joints of the objects while animating or rigging them.

Select curve objects



The **Select curve objects** button is used to select the NURBS curves, curves on surface, and paint effects strokes in the viewport.

Select surface objects



The **Select surface objects** button is used to select the NURBS surfaces, poly surfaces, planes, and GPU cache in the viewport.

Select deformations objects



The **Select deformations objects** button is used to select the lattices, clusters, nonlinear, and sculpt objects in the viewport.

Select dynamic objects



The **Select dynamic objects** button is used to select the dynamic objects in the viewport.

Select rendering objects



The **Select rendering objects** button is used to select the lights, cameras, and textures in the viewport.

Select miscellaneous objects



The **Select miscellaneous objects** button is used to select miscellaneous objects such as IK End Effectors, locators, and dimensions in the viewport.

Lock/Unlock current selection



The **Lock/Unlock current selection** button is used to lock the tool manipulators to the selected object. Select an object in the viewport and choose the **Lock/Unlock current selection** button from the Status Line; the tool manipulators will be locked to the object and no other object can be selected from the viewport.

Highlight Selection mode



The **Highlight Selection mode** button is used to turn off the automatic display of components.

Snap buttons Group

The **Snap buttons** group comprises of different snap tools, as shown in Figure 1-18. The snap tools are used to snap the selected objects to specific points in a scene. The tools in this group are discussed next.



Figure 1-18 The Snap buttons group

Snap to grids



The **Snap to grids** tool is used to snap an object to the closest grid intersection point. For example, to snap a sphere to the closest grid intersection point, choose **Create > NURBS Primitives > Sphere** from the menubar and then click in the viewport; a sphere will be created. Choose the **Snap to grids** tool from the Status Line and invoke **Move Tool** from the Tool Box. Next, press the middle mouse button over the sphere and drag it; the sphere will be snapped to the closest grid intersection point, refer to Figure 1-19.

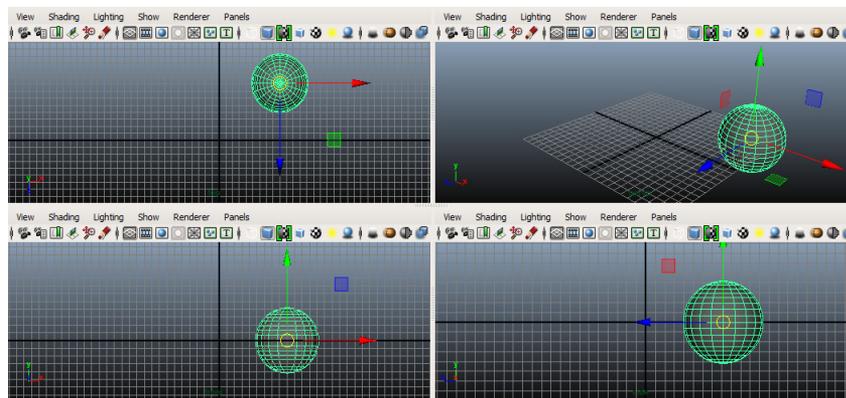


Figure 1-19 The sphere snapped to the closest grid intersection point

Snap to curves



The **Snap to curves** tool is used to snap an object to the curve in the viewport. For example, to snap a cube on a curve, choose **Create > NURBS Primitives > Cube** from the menubar and then click in the viewport; a cube will be created. Next, choose **Create > EP Curve Tool** from the menubar and then create a curve in the top viewport. Press ENTER to exit the **EP Curve Tool**. Next, choose **Move Tool** from the Tool

Box and align the cube over the curve. Choose the **Snap to curves** tool from the Status Line. Press the middle mouse button over the cube and drag it; the cube will move over the curve while remaining snapped to the curve, refer to Figure 1-20.

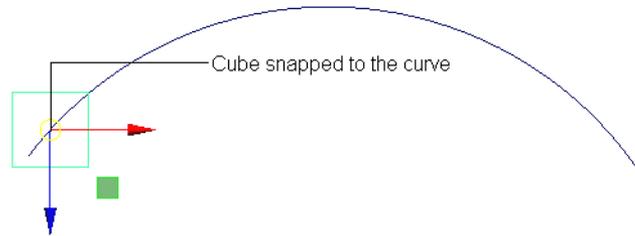


Figure 1-20 The cube snapped to the curve

Snap to points

 The **Snap to points** tool is used to snap the selected objects to closest control vertex or pivot point. For example, to snap a cube to the vertices of a polygonal plane, choose **Create > Polygon Primitives > Plane > Option Box** from the menubar; the **Tool Settings (Polygon Plane Tool)** window will be displayed. Now, set the **Width divisions** and **Height divisions** to **10**, and then click in the viewport to make a plane. Next, create a cube in the viewport, as discussed earlier. Next, select the cube and choose the **Snap to points** tool from the Status Line and drag the cube with the middle mouse button; the cube will snap to the closest control vertex of the polygonal plane.

Snap to Projected Center

 The **Snap to Projected Center** tool is used to snap an object (joint or locator) to the center of the other object. For example, to snap a locator to the center of a polygonal plane, choose **Create > Polygon Primitives > Plane** from the menubar and drag the cursor; a plane will be created. Next, choose **Create > Locator** from the menubar; a locator will be created. Now, select the locator and choose the **Snap to Projected Center** tool from the Status Line; the locator will snap to the center of the polygonal plane.

Snap to view planes

 The **Snap to view planes** tool is used to snap the selected object to the view plane of the viewport.



Tip: You can also use the shortcut keys to perform particular snap functions. For example, press *x* for **Snap to grids**, *c* for **Snap to curves**, and *v* for the **Snap to points** tools.

Make the selected object live

 The **Make the selected object live** tool is used to make the selected surface a live object. A live object is used to create objects or curves directly on its surface. For example, to snap a cube on the surface of a polygonal sphere, choose **Create > Polygon Primitives > Sphere** from the menubar and drag the cursor; a sphere will be created. To create a cube on the surface of the sphere, choose the **Make the selected object live** tool from the Status Line; the sphere will appear in green wireframe. To do so, choose **Create > Polygon Primitives > Cube** from the menubar and drag the cursor; a cube will be created on the surface of the sphere.

History Buttons Group

This group of the Status Line helps you to control various objects. The objects with input connections are affected or controlled by other objects, whereas the objects with output connections affect or control other objects.

Inputs to the selected object



The **Inputs to the selected object** tool is used to edit all input connections for the selected object such that the selected object gets influenced by another object.

Outputs from the selected object



The **Outputs from the selected object** tool is used to select and edit the output operations of an object.

Construction History on/off



The **Construction History on/off** tool is used to record the construction history. The construction history is used to track the changes made on an object at a later stage. Sometimes, the construction history may make a particular file size heavy. To decrease the file size, it is recommended to deactivate this tool.

Render Tools Group

This group of the Status Line is used to access all render controls in Maya. The tools in this group are discussed next.

Open Render View



The **Open Render View** tool is used to open the **Render View** window.

Render the current frame



The **Render the current frame** tool is used to render the selected viewport at the current frame using the **Maya Software** renderer. Choose the **Render the current frame** tool from the Status Line; the **Render View** window will be displayed. The **Render View** window shows the rendered view of the selected scene, refer to Figure 1-21, whereas the **Output Window** will display all the rendering calculations made for rendering the active scene, refer to Figure 1-22.

IPR render the current frame



The **IPR render the current frame** tool is used to perform an **IPR** render. Here, **IPR** stands for Interactive Photorealistic Rendering. This tool helps you to adjust the lighting or the shading attributes of the rendered scene and then update it as per the requirement. To render the current frame, choose this button from the Status Line; the **Render View** window will be displayed. Now, press the left mouse button and drag it in the **Render View** window to set the selection for IPR rendering. As a result, Maya will render the selected part only. In other words, it will help you visualize your scene dynamically. Now, if you make changes in the color or lighting attribute of the scene using the **Attribute Editor**, the selected part will be rendered automatically.

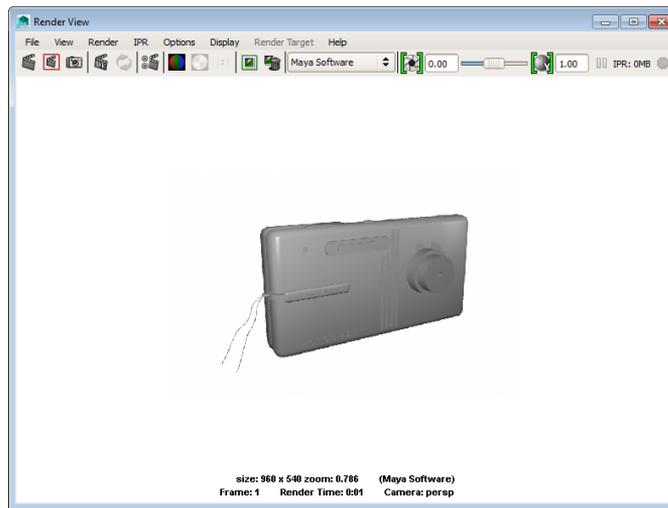


Figure 1-21 The Render View window

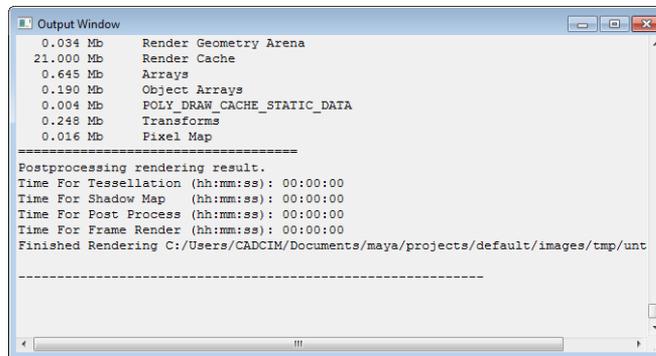


Figure 1-22 The Output Window

Display render settings



On choosing the **Display Render Settings** tool, the **Render Settings** window will be displayed, as shown in Figure 1-23. This window comprises of all controls needed for rendering. These controls help you adjust the render settings such as resolution, file options, ray tracing quality, and so on.

Input Line Operations Group

This group in the Status Line helps you quickly select, rename, and transform the objects that are created in the viewport. Some of the options in the **Name Selection** field are in hidden modes. To view them, move the cursor over the arrow on the left of the input field and then press and hold the left mouse button on it; a flyout will be displayed. Now, select the required option from the flyout; the corresponding mode will be displayed. By default, the **Absolute transform** mode is displayed in the Status Line. All these modes are discussed next.

Absolute transform

The **Absolute transform** area is used to move, rotate, or scale a selected object in the viewport. To do so, invoke the required transformation tool from the Tool Box and enter values in the **X**, **Y** and **Z** edit boxes in the **Absolute transform** area, as shown in Figure 1-24. Now, press ENTER; the selected object will be moved, rotated, and scaled according to the values entered in the edit boxes.



Note

*The **Absolute transform** area takes the center of the viewport as a reference for transforming an object.*

Relative transform

The **Relative transform** area is also used to scale, rotate, or move a selected object in the viewport, refer to Figure 1-25. This area is similar to the **Absolute transform** area with the only difference that the **Relative transform** area takes the current position of the object as a reference point for transforming an object.



*Figure 1-24 The **Absolute transform** area*



*Figure 1-25 The **Relative transform** area*

Rename

The **Rename** area is used to change the name of a selected object. To rename an object, select the object from the viewport whose name you want to change; the default name of the selected object will be displayed in the text box in the **Rename** area, refer to Figure 1-26. Enter a new name for the object in the edit box and press ENTER.



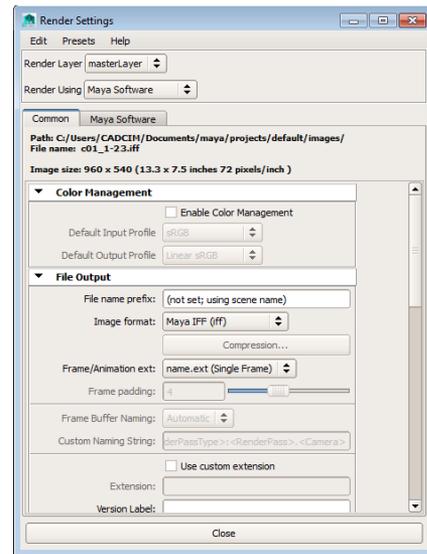
*Figure 1-26 The **Rename** area*

Select by name

You can select an object in the viewport by entering its name in the text box in the **Select by name** area, refer to Figure 1-27.



*Figure 1-27 The **Select by name** area*



*Figure 1-23 The **Render Settings** window*

Sidebar Buttons Group

This is the last part of the Status Line. The Sidebar buttons control the properties of the objects created in the viewport and the tools required for working with the objects. This group consists of four buttons that are discussed next.

Show/Hide Modeling Toolkit

 The **Show/Hide Modeling Toolkit** button is used to open the **Modeling Toolkit** window, as shown in Figure 1-28. The **Modeling Toolkit** is used to perform multiple modeling specific operations from the single window. The tools in the **Modeling Toolkit** window are discussed in later chapters.

Show/Hide Attribute Editor

 The **Show/Hide Attribute Editor** button is used to toggle the visibility of the **Attribute Editor**, refer to Figure 1-29. The **Attribute Editor** is used to control different properties of the selected object.

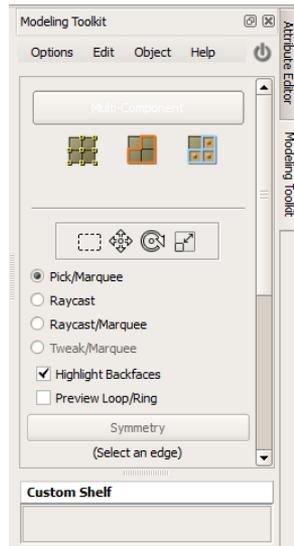


Figure 1-28 The Modeling Toolkit window

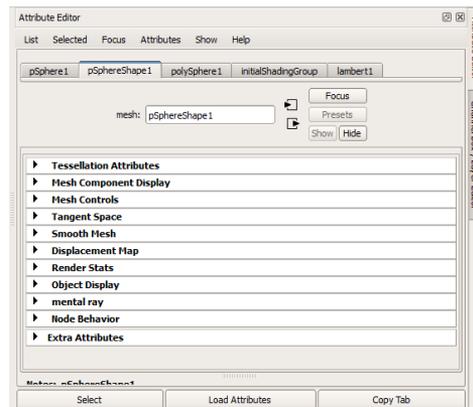


Figure 1-29 The Attribute Editor

Show/Hide Tool Settings

 The **Show/Hide Tool Settings** button is used to display the options for selected tool in the **Tool Settings** window. On choosing this button, the **Tool Settings** window of the selected tool will be displayed on the left of the viewport, adjacent to the Tool Box. For example, if you have chosen **Move Tool** from the Tool Box, then you can control its settings by using the **Tool Settings (Move Tool)** window, as shown in Figure 1-30.

Show/Hide Channel Box

 The **Show/Hide Channel Box** button is used to toggle the visibility of the **Channel Box / Layer Editor**. This button is similar to the **Show or hide the Attribute Editor** button. On choosing this button, the **Channel Box / Layer Editor** will be displayed on

the right of the viewport, as shown in Figure 1-31. The **Channel Box** is used to control the transformation and the geometrical structure of the selected object. The **Layer Editor** is used to organize the objects in a scene when there are many objects in the viewport. Multiple objects can be arranged in the layer editor to simplify the scene.

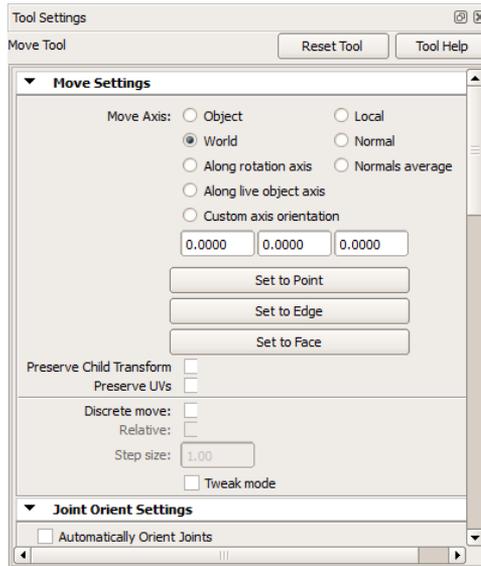


Figure 1-30 Partial view of the **Tool Settings (Move Tool)** window

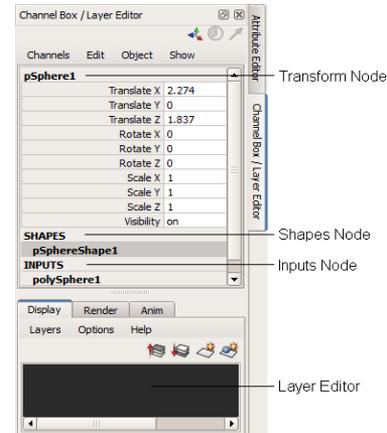


Figure 1-31 The **Channel Box / Layer Editor**



Note

By default, the keyable attributes of selected object(s) are displayed in the **Channel Box**. To add more attributes to it, choose **Window > General Editors > Channel Control** from the menubar; the **Channel Control** window will be displayed. In this window, three areas will be displayed in the **Keyable** tab: **Keyable**, **Nonkeyable Hidden**, and **Nonkeyable**. To add attributes, select them from the **Nonkeyable Hidden** area and then choose the **<< Move** button. Next, choose the **Close** button.

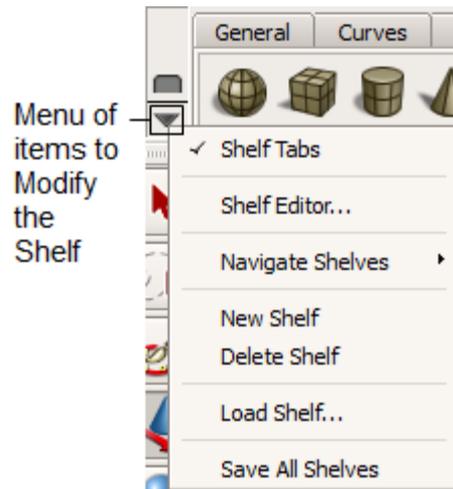
Shelf

The Shelf is located below the Status Line, as shown in Figure 1-32. The Shelf is divided into two parts. The upper part in the Shelf consists of different Shelf tabs and lower part displays the icons of different tools. The icons displayed in this area depend on the tab chosen, refer to Figure 1-32.



Figure 1-32 The **Shelf**

You can also customize the Shelf as per your requirement. To do so, press and hold the left mouse button over the **Menu of items to modify the Shelf** button, refer to Figure 1-33; a flyout will be displayed, as shown in Figure 1-33. Various options in this flyout are discussed next.



*Figure 1-33 Flyout displayed on choosing the **Menu of items to modify the Shelf** button*

Shelf Tabs

The **Shelf Tabs** option is used to toggle the visibility of the Shelf tabs. On choosing this option, the Shelves tabs will disappear, and only the tool icons corresponding to the selected tab will be visible.

Shelf Editor

The **Shelf Editor** option is used to create a Shelf and edit the properties of an existing Shelf. When this option is chosen, the **Shelf Editor** will be displayed in the viewport, as shown in Figure 1-34. Alternatively, you can choose **Window > Settings/Preferences > Shelf Editor** from the menubar to display the **Shelf Editor**. In the **Shelf Editor**, you can change the name and position of shelves and their contents. You can also create a new shelf and its contents using the **Shelf Editor**.

Navigate Shelves

The **Navigate Shelves** option is used to choose the previous or next Shelf of the currently chosen Shelf. On choosing this option, a cascading menu will be displayed, as shown in Figure 1-35. The options in the cascading menu are discussed next.

Previous Shelf

The **Previous Shelf** option is used to choose the Shelf that comes before the currently chosen Shelf. For example, choose the **Rendering** tab; the rendering specific icons will be displayed. Next, press and hold the left mouse button over the **Menu of items to modify the Shelf** option; a flyout will be displayed. Choose **Navigate Shelves** from the flyout; a cascading menu is displayed. From the cascading menu, choose **Previous Shelf**; the **Dynamics** tab is chosen displaying the dynamic specific icons.

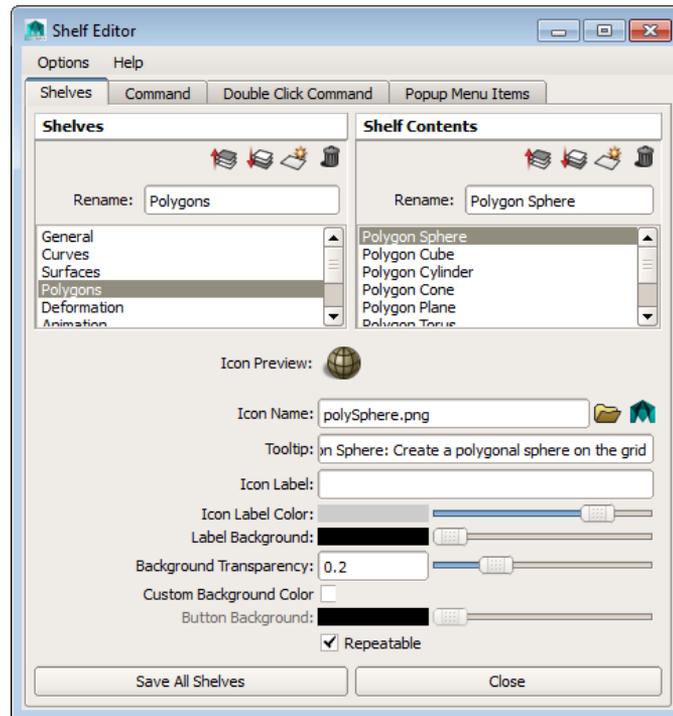


Figure 1-34 The Shelf Editor

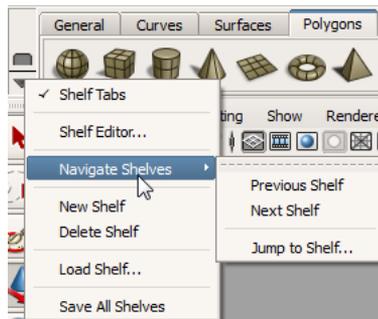


Figure 1-35 Cascading menu displayed on choosing the *Navigate Shelves* option

Next Shelf

The **Next Shelf** option is used to choose the shelf that comes after the currently chosen Shelf.

Jump to Shelf

The **Jump to Shelf** option is used to choose the specific Shelf by entering its name. On choosing this option, the **Jump to Shelf** dialog box will be displayed, as shown in Figure 1-36. Enter the name of the shelf in the **Shelf Name** text box and choose the **OK** button; the **Shelf** tab with icons specific to the corresponding shelf are displayed.

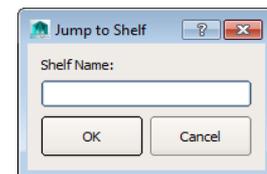


Figure 1-36 The *Jump to Shelf* dialog box

New Shelf

The **New Shelf** option is used to add a new Shelf tab to the existing Shelf. On choosing this option, the **Create New Shelf** dialog box will be displayed, as shown in Figure 1-37. Enter a name for the new Shelf and choose the **OK** button; a new Shelf will be created, as shown in Figure 1-38. For adding different tools in the tools area corresponding to the new Shelf created, press and hold CTRL+SHIFT and then select the desired tools from the pull-down menus.

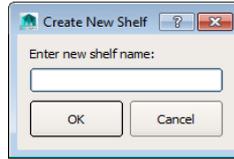


Figure 1-37 The Create New Shelf dialog box



Figure 1-38 A new Shelf added

Delete Shelf

The **Delete Shelf** option is used to delete a shelf. On choosing this option, the **Confirm** message box will be displayed, as shown in Figure 1-39. Choose the **OK** button to delete the selected Shelf.

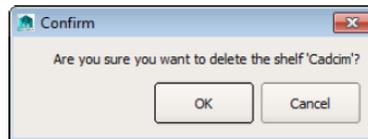


Figure 1-39 The Confirm message box

Load Shelf

The **Load Shelf** option is used to load the shelf that was saved previously. When this option is chosen, the **Open** dialog box will be displayed. You can choose the previously saved shelf from this dialog box; the desired **Shelf** tab will be displayed in the shelf.

Save all Shelves

The **Save all Shelves** option is used to save the shelves, so that you can use them later while working in Maya.

Tool Box

The Tool Box is located on the left side of the workspace. It comprises of the most commonly used tools in Maya. In addition to the commonly used tools, the Tool Box has several other options or commands that help you change the layout of the interface. Various tools in the Tool Box are discussed next.

Select Tool



The **Select Tool** is used to select the objects created in the viewport. To select an object, invoke the **Select Tool** from the Tool Box and click on an object in the viewport; the object will be selected. On invoking this tool, the manipulators will not be activated.

Lasso Tool



The **Lasso Tool** is used to select an object by using a free hand marquee selection. This tool is very much similar to the **Select Tool**. To select an object, invoke the **Lasso Tool**; the cursor will change to a rope knot. Next, press and hold the left mouse button and drag the cursor in the viewport to create a selection area around the object. Then, release the left mouse button; the object inside the selection area will be selected. To adjust the properties of the **Lasso Tool**, make sure that the **Lasso Tool** is invoked, and then choose the **Show/Hide Tool Settings** button from the Status Line; the **Tool Settings (Lasso Tool)** window will be displayed. Adjust the **Lasso Tool** properties from the **Tool Settings (Lasso Tool)** window as per your requirement.

Paint Selection Tool



The **Paint Selection Tool** is used to select various components of an object. To select various components of an object, invoke the **Select Tool** from the Tool Box and select an object in the viewport. Next, press and hold the right mouse button over the selected object; a marking menu will be displayed. Choose **Vertex** from the marking menu to make the vertex selection mode active. Now, choose the **Paint Selection Tool** from the Tool Box; the cursor will change to the paint brush. Next, press and hold the left mouse button and drag the cursor over the object to select the desired vertices. To go back to the object mode, press and hold the right mouse button over the selected object; a marking menu will be displayed. Choose **Object Mode** from the marking menu to make the vertex selection mode inactive.

You can also increase the size of the **Paint Selection Tool** cursor. To do so, press and hold the B key on the keyboard. Next, press and hold the middle mouse button in the viewport and drag the cursor to adjust the size of the brush.

Move Tool



The **Move Tool** is used to move an object from one place to another in the viewport. To do so, invoke **Move Tool** from the Tool Box; the cursor will change to an arrow with a box at its tip. Select the object in the workspace that you want to move. You can move the selected object in the X, Y, and Z directions by using the handles/manipulators over the object. You can also adjust the properties of the **Move Tool** by choosing the **Show/Hide Tool Settings** button from the Status Line or by double-clicking on the **Move Tool** itself. To use the **Move Tool**, you need to create an object in the viewport. To do so, create a sphere by choosing **Create > Polygon Primitives > Sphere** from the menubar; the text '**Drag on the grid**' will be displayed in the viewport. Next, drag the cursor from one place to the other or click anywhere in the viewport; a sphere will be created. Now, invoke the **Move Tool** from the Tool Box and select the object created by clicking on it; the **Move Tool** manipulator will be displayed on the selected object with three color handles, as shown in Figure 1-40. These three color handles are used to move the object in the X, Y, or Z direction. The colors of the handles represent three axes; red represents the X-axis, green represents the Y-axis, and blue

represents the Z-axis. At the intersection point of these handles, a box will be displayed that can be used to move the object proportionately in all the three directions. Press and hold the left mouse button over the box and drag the cursor to move the object freely in the viewport. To adjust the default settings of the **Move Tool**, double-click on it in the Tool Box; the **Tool Settings (Move Tool)** window will be displayed, as shown in Figure 1-41. Change the settings as per your requirement in this window.

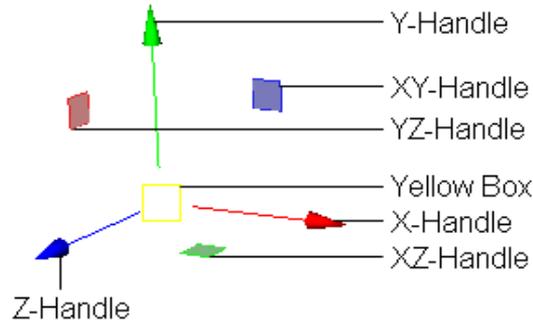


Figure 1-40 The Move Tool manipulator

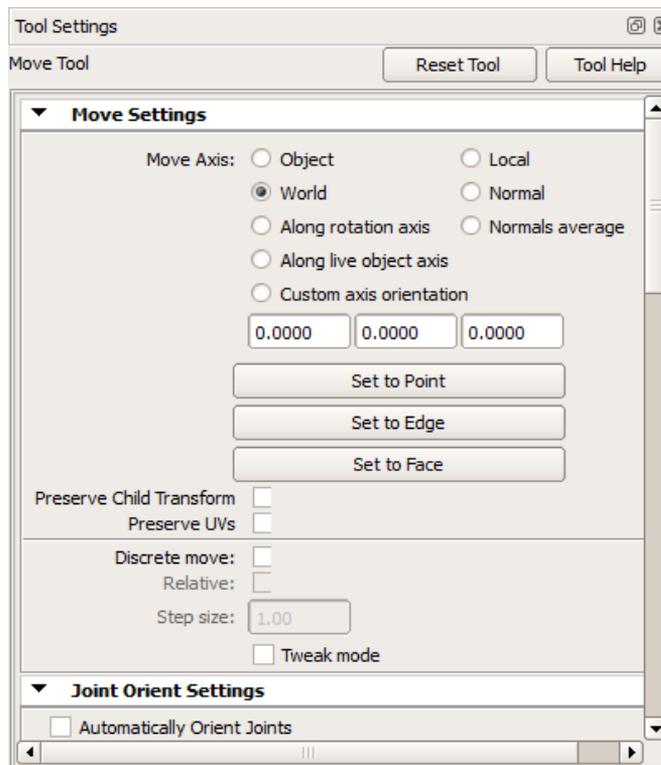


Figure 1-41 Partial view of the Tool Settings (Move Tool) window

If the manipulator is not displayed on the object, then you need to set the pivot point of that object. To do so, make sure that the **Move Tool** is invoked and then press the INSERT key; the pivot point will be displayed in the viewport, as shown in Figure 1-42. Move the pivot

point to adjust its position. Alternatively, choose **Modify > Center Pivot** from the menu bar; the pivot point will be adjusted to the center of the object. You can also adjust the pivot point by pressing and holding the d key and moving the manipulator.

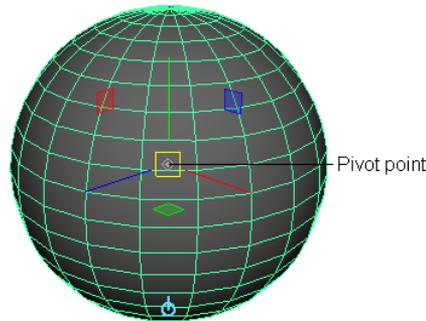


Figure 1-42 The pivot point

**Note**

A pivot is a point in 3D space that is used as a reference point for the transformation of objects.

Rotate Tool

The **Rotate Tool** is used to rotate an object along the X, Y, or Z axis. To rotate an object in the viewport, select the object and invoke the **Rotate Tool** from the Tool Box; the **Rotate Tool** manipulator will be displayed on the object, as shown in Figure 1-43. The **Rotate Tool** manipulator consists of three colored rings. The red ring represents the X axis, whereas the green and blue rings represent the Y and Z axes, respectively. Moreover, the yellow ring around the selected object helps you rotate the selected object in the view axis. On selecting a particular ring, its color changes to yellow. You can change the default settings of the **Rotate Tool** by double-clicking on it in the Tool Box. On doing so, the **Tool Settings (Rotate Tool)** window will be displayed, as shown in Figure 1-44. This window contains various options for rotation. You can change the settings in this window as required.

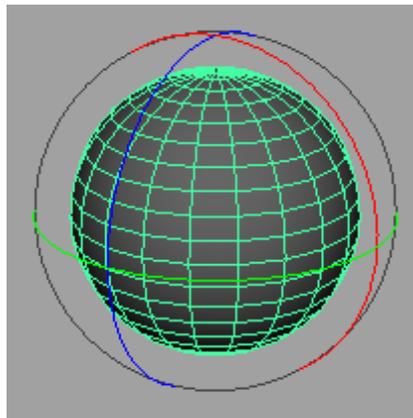


Figure 1-43 The Rotate Tool manipulator

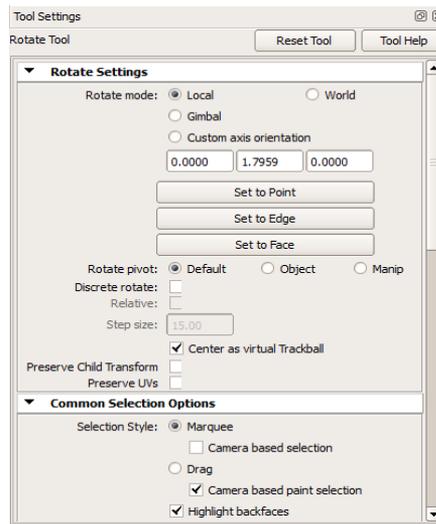


Figure 1-44 Partial view of the Tool Settings (Rotate Tool) window

Scale Tool



The **Scale Tool** is used to scale an object along the X, Y, or Z-axis. To scale an object in the viewport, select the object and invoke **Scale Tool** from the Tool Box; **Scale Tool** manipulator will be displayed on the object, as shown in Figure 1-45.

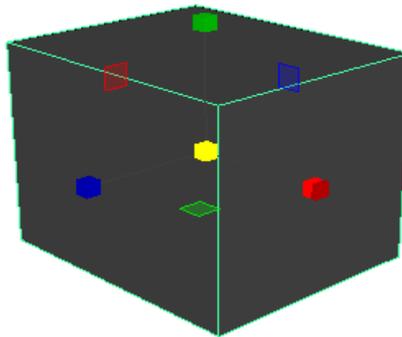
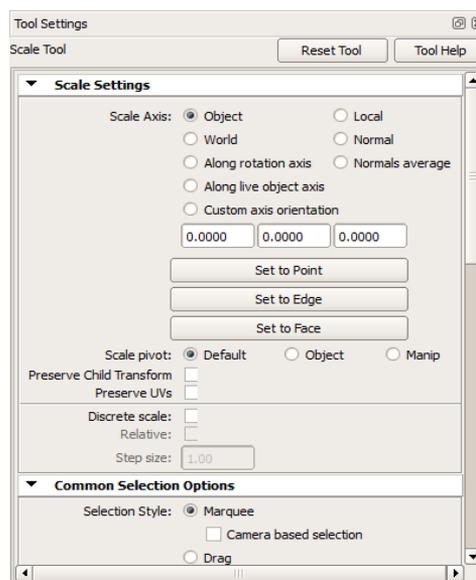


Figure 1-45 The Scale Tool manipulator

The **Scale Tool** manipulator consists of three boxes. The red box represents the X axis, whereas the green and blue boxes represent the Y and Z axes, respectively. Moreover, the yellow colored box in the center lets you scale the selected object uniformly in all axes. On selecting any one of these colored scale boxes, the default color of the box changes to yellow. You can also adjust the default settings of **Scale Tool** by double-clicking on it in the Tool Box. On doing so, the **Tool Settings (Scale Tool)** window will be displayed, as shown in Figure 1-46. Make the required changes in the **Tool Settings (Scale Tool)** window to adjust the basic attributes of **Scale Tool**.



*Figure 1-46 The partial view of the **Tool Settings (Scale Tool)** window*



Note

While rotating, moving, or scaling an object, different colored handles are displayed. These handles indicate different axes. You can use this color scheme while working with three transform tools as well. The red, green, and blue colors represent the X, Y, and Z axes, respectively.

Last Tool Used



The **Last Tool Used** tool is used to invoke the last used or the currently selected tool. This tool displays the icon of the last used tool or currently active tool.

Quick Layout Buttons

Using the buttons in the **Quick Layout** buttons area, refer to Figure 1-6, you can toggle the display of layouts as required. You can also change the display of layout buttons. To do so, right-click on one of the **Quick Layout** buttons; a shortcut menu with various layout options will be displayed, as shown in Figure 1-47. Next, choose any of the layout from the shortcut menu as per your need; the current layout will be replaced by the chosen layout. Using these buttons, you can also edit the current layout. To do so, right-click on the **Quick Layout** buttons; a shortcut menu will be displayed. Choose **Edit Layouts** from the shortcut menu; the **Panels** window will be displayed, as shown in Figure 1-48.

Time Slider and Range Slider

The Time Slider and the Range Slider, as shown in Figure 1-49, are located at the bottom of the viewport. These two sliders are used to control the frames in animation. The Time Slider comprises of the frames that are used for animation. There is an input box on the Time Slider called **Set the current time**, which indicates the current frame of animation. The keys in the Time Slider are displayed as red lines.



Figure 1-47 Shortcut menu displayed on right-clicking on **Quick Layout** button

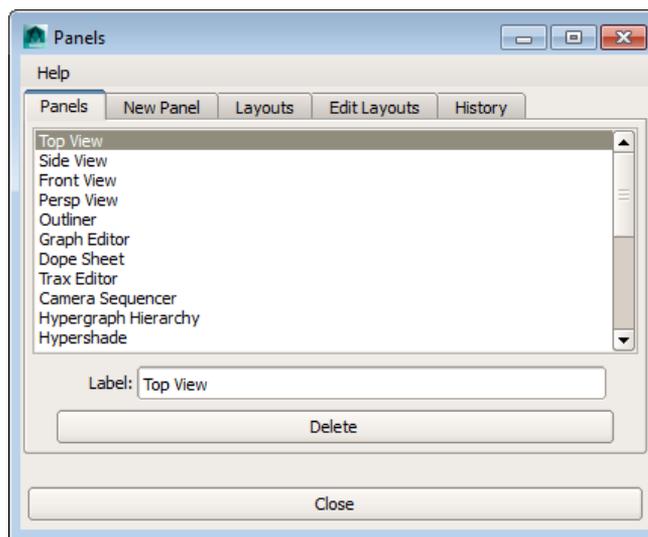


Figure 1-48 The **Panels** window

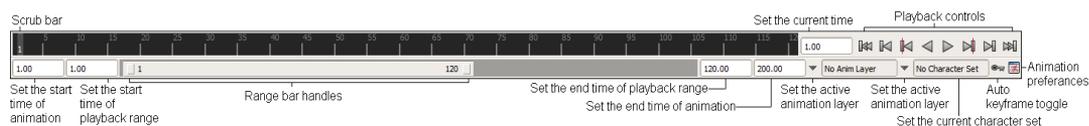


Figure 1-49 The Time Slider and the Range Slider

The Time Slider displays the range of frames available in your animation. In the Time Slider, the grey box, known as scrub bar, is used to move back and forth in the active range of frames available for animation. The Playback Controls at the extreme right of the current frame help you to play and stop the animation. The Range Slider located below the Time Slider is used to adjust the range of animation playback. The Range Slider shows the start and end time of the active animation. The edit boxes both on the left and right of the Range Slider direct you to the start and end frames of the selected range. The length of the Range Slider can be altered using these edit boxes. At the right of the **Set the end time of the animation** input box is the **Set the active animation layer** button. This feature gives you access to all the options needed to create and manipulate the animation layers. This option helps you to blend multiple animations in a scene. The **Set the current character set** is located on the right of the Range Slider. It is used to gain automatic control over the character animated object. There are two buttons on the extreme right of the Range Slider: **Auto keyframe toggle** and **Animation preferences**. These buttons are discussed next.



Tip: You can also set the keys for animation by choosing *Animate > Set key* from the menubar or by pressing the 's' key.

Auto keyframe toggle



The **Auto keyframe toggle** button is used to set the keyframes. This button sets the keyframe automatically whenever an animated value is changed. Its color turns red when it is activated.

Animation preferences button



The **Animation preferences** button is used to modify the animation controls. On choosing this button, the **Preferences** dialog box will be displayed, as shown in Figure 1-50. In the **Preferences** dialog box, the **Time Slider** option is selected by default in the **Categories** area. You can set the animation controls in the **Time Slider** and **Playback** area of the **Preferences** window. Choose the **Save** button to save the changes and close the dialog box.

Command Line

The Command Line is located below the Range Slider. It works in Maya interface by using the MEL script or the Python script. The MEL and Python are the scripting languages used in Maya. Choose the **MEL** button to switch between the two scripts. The **MEL** button is located above the Help Line.

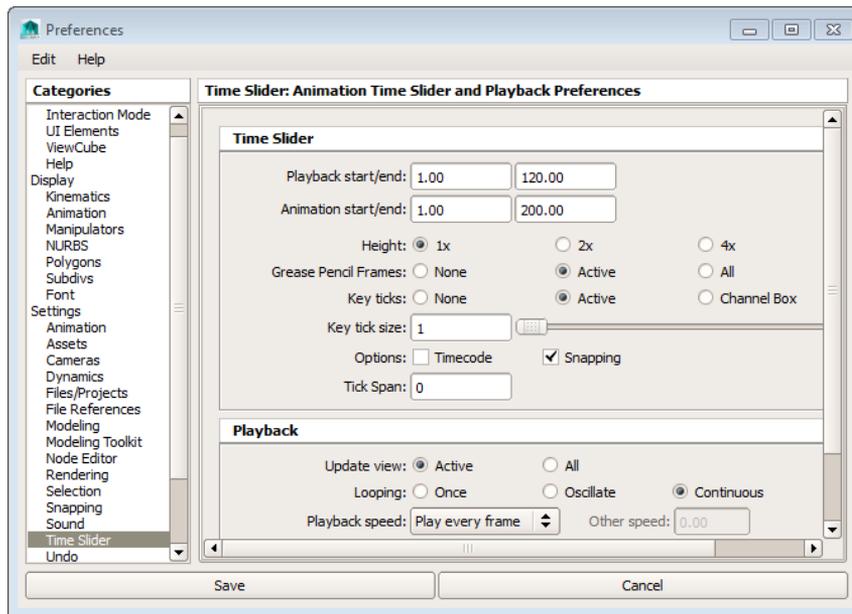


Figure 1-50 The Preferences dialog box



Note

MEL stands for MAYA Embedded Language. The MEL command is a group of text strings that are used to perform various functions in Maya.

The Command Line also displays messages from the program in a grey box on the right. At the extreme right of the Command Line, there is an icon for the **Script Editor**. The **Script Editor** is used to enter complex and complicated MEL and Python scripts into the scene.

Help Line

The Help Line is located at the bottom of the Command Line. It provides a brief description about the selected tool or the active area in the Maya interface.

Panel Menu

The **Panel** menu is available in every viewport, as shown in Figure 1-51. The commands or options in the **Panel** menu controls all the actions performed in the workspace. The **Panel** menu comprises of six menus, which are discussed next.

View

The **View** menu is used to view the object in the viewport from different angles using different camera views.

Shading

The **Shading** menu is used to view the object in various shading modes such as **Wireframe**, **Smooth Shade All**, **Flat Shade All**, **X-Ray**, and so on. You can also use the **Wireframe on Shaded** option in this menu for working comfortably in the shaded mode.

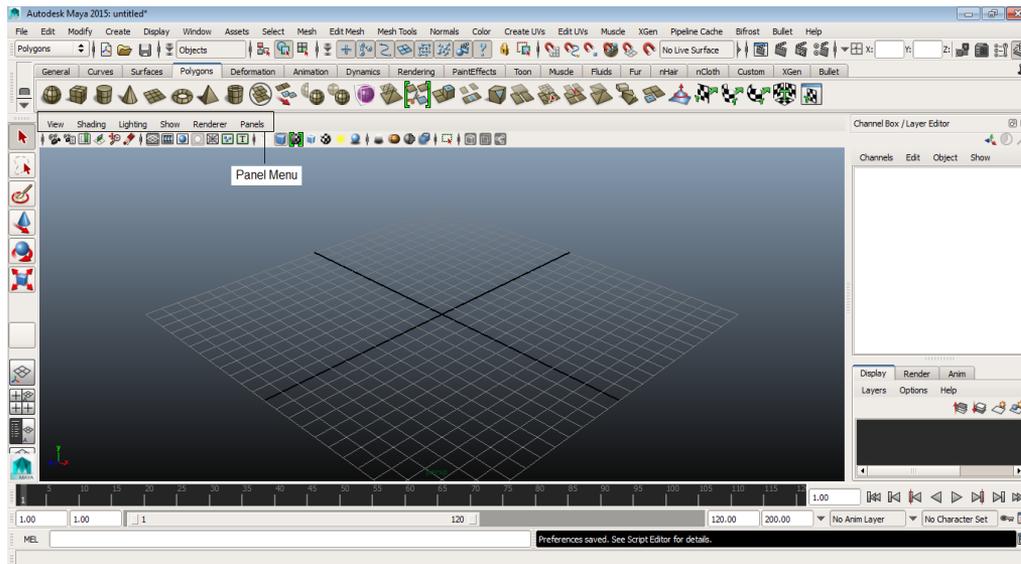


Figure 1-51 The *Panel* menu

Lighting

The **Lighting** menu helps you use different presets of lights that help in illuminating objects in the viewport.

Show

The **Show** menu is used to hide or unhide a particular group of objects in the viewport.

Renderer

The **Renderer** menu is used to set the quality of rendering in the viewport. You can also set the color texture resolution and the bump texture resolution for high quality rendering using the options in this menu.

Panels

The **Panels** menu is used to switch the active viewport to a different view.

Panel Toolbar

The **Panel** toolbar, as shown in Figure 1-52, is located just below the **Panel** menu of all viewports. This toolbar consists of the most commonly used tools present in the **Panel** menu. These tools are discussed next.



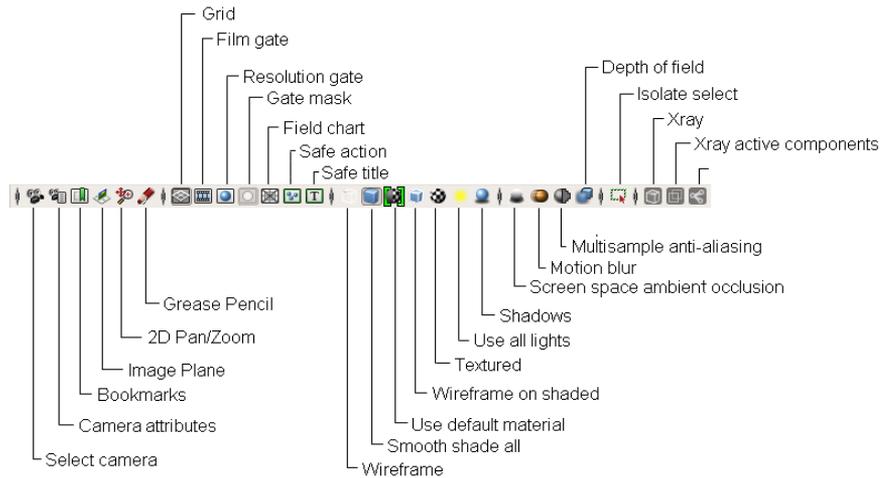


Figure 1-52 The Panel toolbar

Select camera

The **Select camera** tool is used to select the active camera in the selected viewport. You can also select the current camera in a scene by choosing **View > Select Camera** from the **Panel** menu. To switch between different camera views, right-click on the **Select camera** tool; a shortcut menu will be displayed, as shown in Figure 1-53. Now, you can switch to the desired camera views by choosing the corresponding option from the shortcut menu.

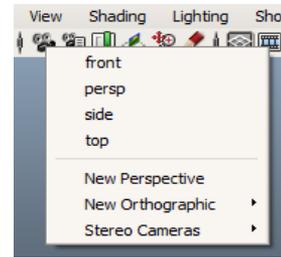


Figure 1-53 The shortcut menu displayed on right-clicking on the **Select Camera** tool

Camera attributes

The **Camera attributes** tool is used to display the attributes of the active camera in the **Attribute Editor**. The attributes are displayed on the right of the viewport in the **Attribute Editor**. You can also view the attributes by choosing **View > Camera Attribute Editor** from the **Panel** menu.

Bookmarks

The **Bookmarks** tool is used to set the current view as a bookmark. To set a bookmark, you can set a view in the viewport and then invoke the **Bookmarks** tool; the set view is bookmarked for further reference. You can also edit an existing bookmark. To do so, press and hold the right mouse button over the tool; a shortcut menu with a list of bookmarks created will be displayed. Choose the **Edit 2D Bookmarks** option from this shortcut menu. On doing so, the **Bookmark Editor (persp)** dialog box will be displayed, as shown in Figure 1-54. You can change the name and other attributes of the selected bookmark from this dialog box.

Image Plane

The **Image Plane** tool is used to import an image to the active viewport. On choosing the **Image Plane** tool, the **Open** dialog box will be displayed. In the **Open** dialog box, choose

the image that you want to insert in the active viewport; the image plane will be inserted in the viewport. You can also set the image to the active viewport by choosing **View > Image Plane > Import Image** from the **Panel** menu.

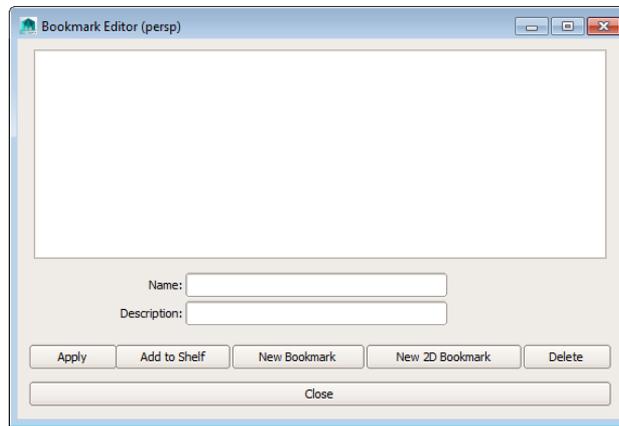


Figure 1-54 The Bookmark Editor (persp) dialog box

2D Pan/Zoom

The **2D Pan/Zoom** tool is used to toggle the 2D pan/zoom mode on or off.

Grease Pencil

The **Grease Pencil** tool is used to draw 2D sketches in the viewport. On invoking this tool, the **Grease Pencil** window will be displayed, as shown in Figure 1-55. You can also invoke this tool by choosing **View > Camera Tools > Grease Pencil Tool** from the **Panel** menu.



Figure 1-55 The Grease Pencil window

Grid

The **Grid** tool is used to toggle the visibility of the grid in the viewport. You can also invoke this tool by choosing **Show > Grid** from the **Panel** menu. In addition, you can set the attributes for the grid in the viewport by using this tool. To set the grid attributes, press and hold the right mouse button on the **Grid** tool in the **Panel** toolbar; a flyout will be displayed. Choose **Grid Options** from the flyout; the **Grid Options** dialog box will be displayed, as shown in Figure 1-56. Next, you can set the grid attributes in this dialog box as per your requirement.

Film gate

The **Film gate** tool is used to toggle the visibility of **Film Gate** border on or off in the active viewport. You can also choose **View > Camera Settings > Film gate** from the **Panel** menu to display the **Film gate** border in the active viewport.

Resolution gate

The **Resolution gate** tool is used to toggle the display of the **Resolution gate** border on or off in the active viewport. The resolution gate sets the area in the viewport that will be rendered.

You can also choose **View > Camera Settings > Resolution gate** from the **Panel** menu to set the resolution gate in the active viewport.

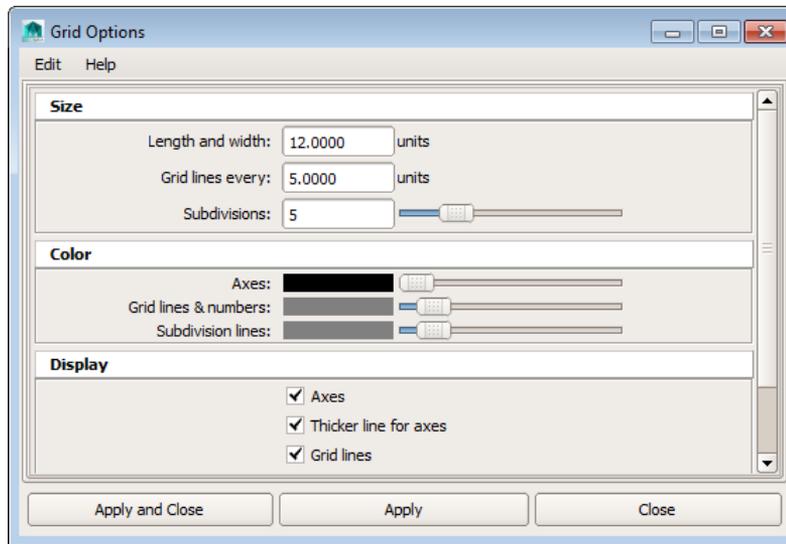


Figure 1-56 The Grid Options dialog box

Gate mask

The **Gate mask** tool is used to turn on the display of the **Gate mask** border. It changes the color and opacity of the area that lies outside the **Film gate** or the **Resolution gate**. The gate mask will only work when you have the **Film gate** or the **Resolution gate** applied to the active viewport. You can also choose **View > Camera Settings > Gate mask** from the **Panel** menu to display the gate mask in the active viewport.

Field chart

The **Field chart** tool is used to turn on the display of the field chart border. On choosing the **Field chart** tool, a grid is displayed, representing twelve standard cell animation field sizes. The **Field chart** tool should be used only when the render resolution is set to NTSC dimensions. You can also invoke this tool by choosing **View > Camera Settings > Field chart** from the **Panel** menu.

Safe action

The **Safe action** tool is used to turn on the display of the **Safe action** border. It is used to set the region in the active viewport for TV production. You can also invoke this tool by choosing **View > Camera Settings > Safe action** from the **Panel** menu.

Safe title

The **Safe title** tool is used to turn on the display of the safe title border. It is also used to set the region for TV production in the active viewport. This tool should be used only when the render resolution is set to NTSC or PAL dimensions. You can also invoke this tool by choosing **View > Camera Settings > Safe title** from the **Panel** menu.

Wireframe

The **Wireframe** tool is used to toggle the wireframe display on or off. You can also choose **Shading > Wireframe** from the **Panel** menu to switch to the wireframe mode. Alternatively, press 4 from the keyboard to turn on the **Wireframe** mode.

Smooth shade all

The **Smooth shade all** tool is used to set the display to smooth shade. You can also choose **Shading > Smooth shade all** from the **Panel** menu to switch to smooth shade mode. Alternatively, press 5 from the keyboard to turn on the **Smooth shade all** mode.

Use default material

The **Use default material** tool is used to display the default material on the objects, when they are in the smooth shaded mode.

Wireframe on shaded

The **Wireframe on shaded** tool is used to draw wireframes over the smooth shaded objects. You can also invoke this tool by choosing **Shading > Wireframe on shaded** from the **Panel** menu.

Textured

The **Textured** tool is used to set the hardware texturing display of the objects in the viewport. Alternatively, press 6 from the keyboard to switch to the textured mode.

Use all lights

The **Use all lights** tool is used to illuminate objects by using all lights in the viewport. Alternatively, choose **Lighting > Use all lights** from the **Panel** menu or press 7.

Shadows

The **Shadows** tool is used to display the hardware shadow maps. Alternatively, choose **Lighting > Shadows** from the **Panel** menu. This tool is only activated when the **Use All Lights** tool is selected in the **Panel** menu.

Screen space ambient occlusion

The **Screen space ambient occlusion** tool is used to toggle the display of the ambient occlusion in the viewport. This tool is enabled only when **Viewport 2.0** is active.

Motion blur

The **Motion blur** tool is used to toggle the display of motion blur in the viewport itself. This tool is enabled only when **Viewport 2.0** is active.

Multisample anti-aliasing

The **Multisample anti-aliasing** tool is used to toggle the display of multisample anti-aliasing in the viewport itself. This tool is enabled only when **Viewport 2.0** is active.

Depth of field

The **Depth of field** tool is used to toggle the display of depth of field in the viewport itself. This tool is enabled only when **Viewport 2.0** is active.

Isolate select

The **Isolate select** tool is used to display only the selected object in the viewport. To do so, select an object in the viewport and choose the **Isolate select** button from the **Panel** toolbar. Alternatively, choose **Show > Isolate Select** from the **Panel** menu or press SHIFT + I.

XRay

The **XRay** tool is used to make the objects semi-transparent in the viewport. You can also choose **Shading > X-Ray** from the **Panel** menu to switch to the **XRay** mode.

XRay active components

The **XRay active components** tool is used to display the active components over the top of other shaded objects. You can also invoke this tool by choosing **Shading > XRay active components** from the **Panel** menu.

XRay joints

The **XRay joints** tool is used to display the skeleton joints over the top of other objects in the shaded mode. You can also choose this tool by choosing **Shading > XRay joints** from the **Panel** menu.



Note

Your system should have a good quality graphic card to support high quality settings.

Channel Box / Layer Editor

The **Channel Box** and the **Layer Editor** are used to edit the attributes of an object. The **Channel Box** consists of all object attributes used for editing, and the **Layer Editor** is used for creating layers for objects in the scene. To display the **Channel Box / Layer Editor**, choose **Display > UI Elements > Channel Box / Layer Editor** from the menubar. Alternatively, press the CTRL +A keys to open the **Channel Box / Layer Editor**, if it is not already displayed. Select an object; the attributes of the selected object will be displayed in the **Channel Box / Layer Editor**, refer to Figure 1-57. The **Channel Box** is further divided into three parts, which are discussed next.

Transform node

The Transform node contains the transformation attributes of the selected object. Select an object from the viewport; the Transform node will become active. In Figure 1-57, **nurbsSphere1** is the Transform node of a NURBS sphere. Enter the transform values in different transform parameters

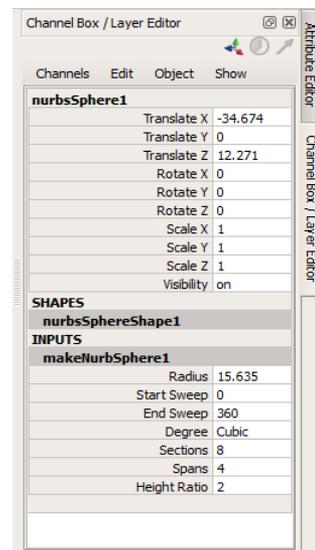


Figure 1-57 The Channel Box /Layer Editor

to transform the object in the viewport. Alternatively, click on an attribute name in the Transform node; the background of the attribute will change to blue color. Now, move the cursor to the viewport, press and hold the middle mouse button and drag it to make changes in the parameters of the selected attribute. You can also adjust the values of more than one attribute at a time. To do so, press and hold the SHIFT key and select the attributes that you want to adjust and then place the cursor in the viewport. Now, press and hold the middle mouse button and drag the cursor to make changes in the selected attributes. Choose the **Visibility** attribute to set the visibility of the object. Enter **0** in the **Visibility** edit box to make the visibility of the selected object off, and enter **1** in the **Visibility** edit box to set the visibility on.

SHAPES node

The **SHAPES** node provides a brief information about an object. It displays the shape name of the selected object, refer to Figure 1-57. For example, when you create a NURBS sphere in the viewport, it is named as **nurbsSphereShape1**. Here, NURBS indicates that the object has been created using the NURBS primitives; **Sphere** indicates that a sphere has been created; and **Shape1** indicates that this is the first sphere shape created in the viewport.

INPUTS node

The **INPUTS** node is used to modify the geometric structure of an object. To do so, create a sphere in the viewport and make sure that it is selected in the viewport. Next, select the **makeNurbSphere1** in the **INPUTS** node of the **Channel Box**; the geometric attributes of the sphere will be displayed, refer to Figure 1-57. Now, you can adjust the geometric values of the sphere as required.

The **Layer Editor** is located below the **Channel Box**. To create a new layer in the **Layer Editor**, choose **Layers > Create Empty Layer** from the **Layer Editor**, as shown in Figure 1-58; a new layer will be created. To add an object to the layer, select the object in the viewport and then press and hold the right mouse button over the empty layer; a flyout will be displayed. Choose **Add Selected Objects** from the flyout; the selected object will be added to the layer.

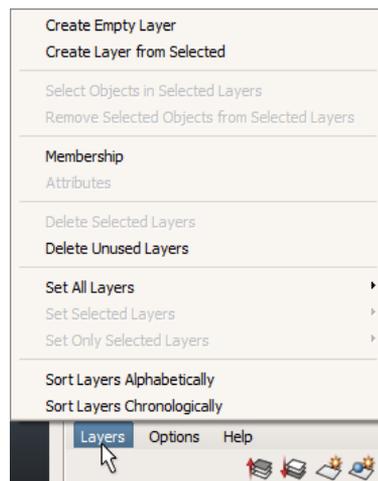


Figure 1-58 Creating a new layer in the **Layer Editor**

The **Layer Editor** is mainly used when there are multiple objects in a scene. You can also change the name and color of layers by using the **Layer Editor**. To do so, double-click on the name of a layer; the **Edit Layer** dialog box will be displayed, as shown in Figure 1-59. Enter the name of the layer in the **Name** text box. You can select the display option of the object from the **Display type** drop-down list. If you select the **Normal** option from this list, the object will be displayed in its object mode and will be selectable. If you select the **Template** option from the drop-down list, the object will be displayed in the wireframe mode and the object will not be selectable. Similarly, if you select the **Reference** option, the object will be displayed in the shaded mode and will not be selectable. You can also set the visibility of an object by selecting the **Visible** check box. The **Color** swatches located at the bottom of the dialog box enables you to select a color for the layer to give it a distinct identity as compared to other layers.

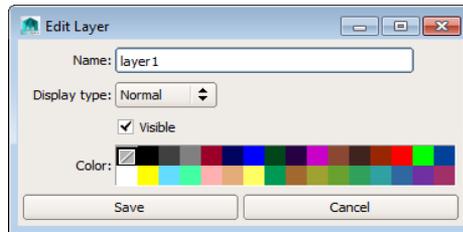


Figure 1-59 The *Edit Layer* dialog box

Attribute Editor

The Attribute Editor provides information about various attributes of a selected object, tool, or the material applied to the selected object. It is also used to make changes in the attributes of the selected object. Choose **Display > UI Elements > Attribute Editor** from the menubar; the **Attribute Editor** will be displayed on the right of the viewport, refer to Figure 1-60. The **Attribute Editor** comprises of a number of attribute tabs that help you modify an object.

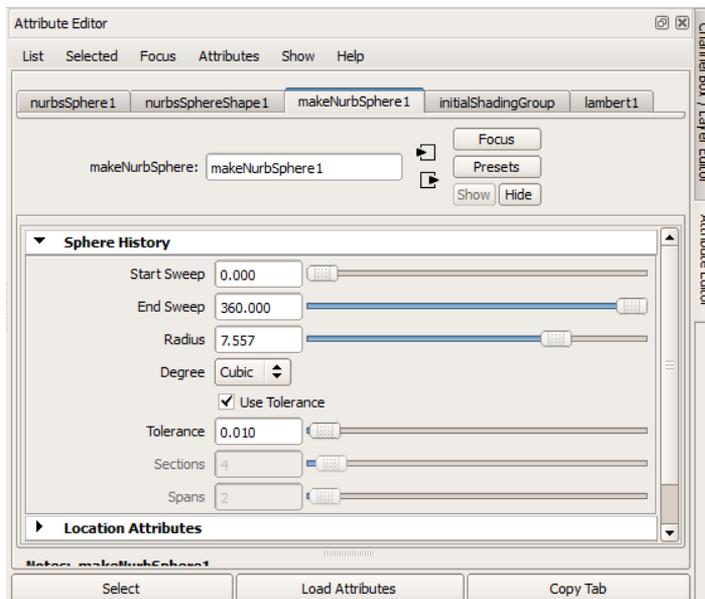


Figure 1-60 The *Attribute Editor*

HOTKEYS

In Maya 2015, you can create your own shortcut keys or even change default shortcuts. To do so, choose **Window > Settings/Preferences > Hotkey Editor** from the menubar; the **Hotkey Editor** will be displayed, as shown in Figure 1-61. Choose the required options from the **Categories** and **Commands** lists to assign a shortcut key. Choose the **List All** button in the **Hotkey Editor** to access all mapped and unmapped keys; the **List Hotkeys** window will be displayed, as shown in Figure 1-62. At the lower part of the **Hotkey Editor**, you can enter a brief description of all commands or shortcuts that you have created.

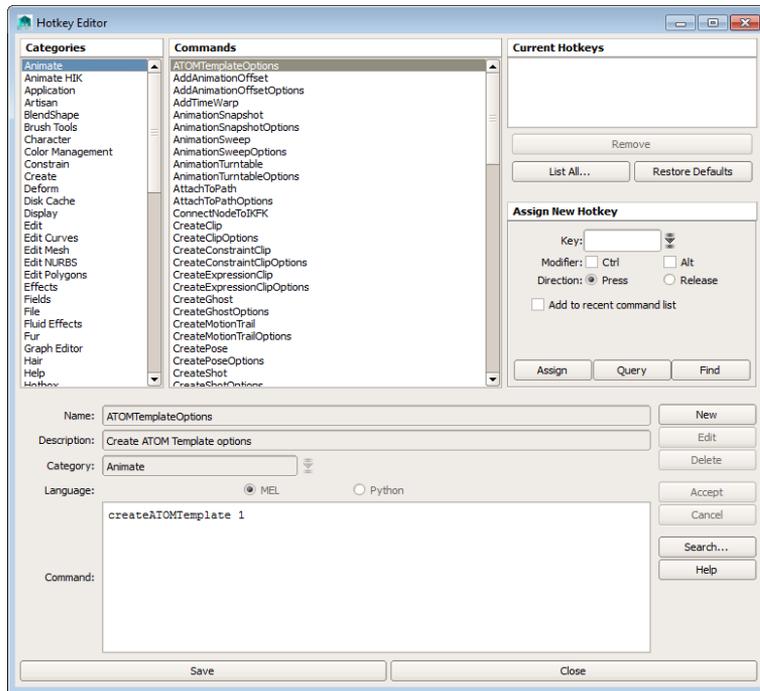


Figure 1-61 The Hotkey Editor

HOTBOX

Hotbox, as shown in Figure 1-63, helps you access menu items in a viewport. The Hotbox is very useful, when you work in the expert mode or the full screen mode. It helps you access the menu items and tools by using cursor in the workspace. To access a command, press and hold the SPACEBAR key; the Hotbox will be displayed. Now, you can choose the option that you need to work from the Hotbox. The Hotbox is divided into five distinct zones, East, West, North, South, and Center zone, refer to Figure 1-63.



Note

You can turn off various UI elements in the Maya interface to get more space and then use the Hotbox to access various commands and tools. But you should do it only after you have established a workflow for yourself. In the beginning, you should use the menubar at the top of the screen instead of using the Hotbox, as it reduces the possibility of confusion in finding a command at a later stage.

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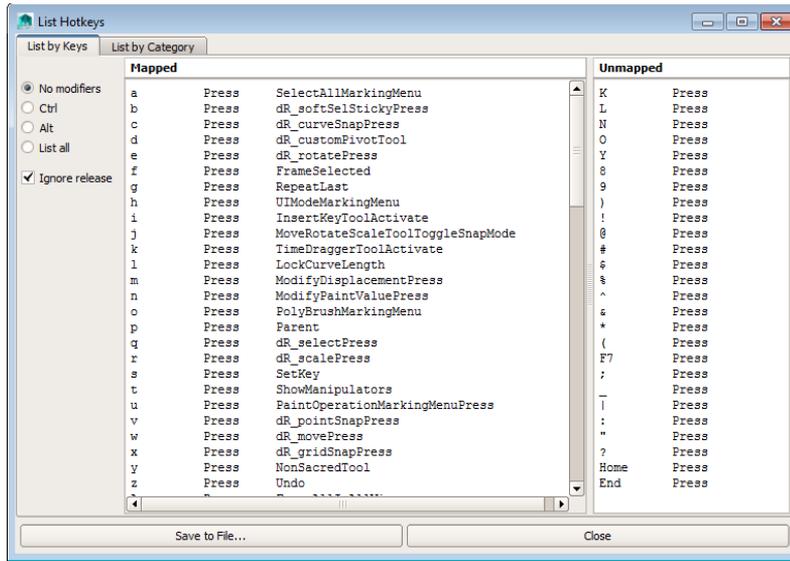


Figure 1-62 The List Hotkeys window

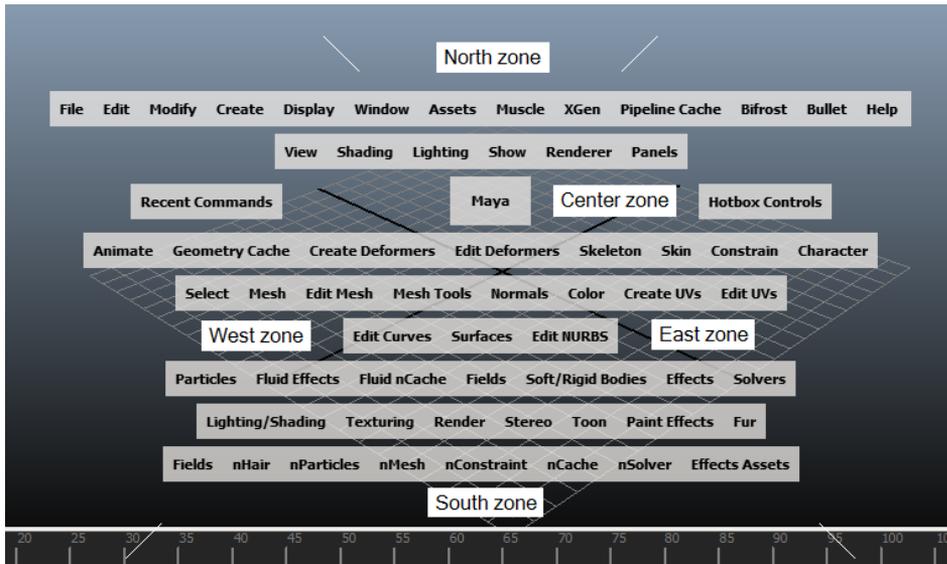


Figure 1-63 The Hotbox

OUTLINER

The **Outliner** window is used to display all objects of a scene in a hierarchical manner, as shown in Figure 1-64. An object in the scene can be selected by simply clicking on its name in the **Outliner** window. In the **Outliner** window, the objects are placed in order of their creation in the viewport. For example, if you create a cube in the viewport followed by a sphere and a cylinder, then all these objects will be placed in a sequential manner in the **Outliner** window, which means the object (cube) created first will be placed first and the object created last

(cylinder) will be placed at the last. To organize the sequence manually, choose the MMB and then drag and drop one object below another object. To rename an object, double-click on the name of the object. At the top of the **Outliner** window, there is an edit box known as the Text Filter Box. You can use this box to select objects with a particular name. For example, enter ***front*** in the box and press ENTER; all objects having the word 'front' in their name will be selected in the viewport. By default, there are four cameras in the **Outliner** window that represent four default viewports in Maya. As discussed earlier, everything that you see in the viewport is seen through the camera view. These cameras are visible in the **Outliner** window by default. Each object in the **Outliner** window has an icon of its own. When you double-click on any of these icons, the **Attribute Editor** will be displayed, where you can change the properties of various objects.

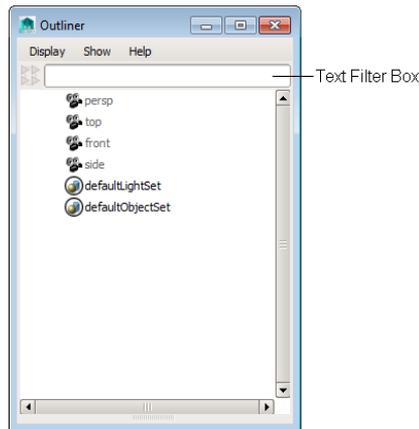


Figure 1-64 Objects displayed in the **Outliner** window

MARKING MENU

Marking menus are similar to shortcut menus that consist of almost all tools required to perform an operation on an object. There are three types of marking menus in Maya. The first type of marking menu is used to create default objects in the viewport. To create a default object, press and hold the SHIFT key and then right-click anywhere in the viewport; a marking menu will be displayed, as shown in Figure 1-65. In this marking menu, choose the object that you want to create.

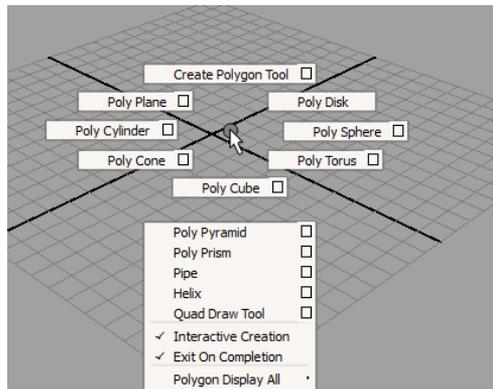


Figure 1-65 Marking menu displaying options used for creating default objects

The second type of marking menu is used to switch amongst various components of an object such as vertices, faces, edges, and so on. To invoke this marking menu, select an object and right-click; the marking menu will be displayed, as shown in Figure 1-66. Now, you can select the desired component of the selected object. This marking menu can also be used to add texture to an object. To do so, choose the **Assign New Material** option from this marking menu; the **Assign New Material** window will be displayed. Next, choose the required material; the material will be applied to the selected object. This method will be discussed in detail in later chapters.

The third type of marking menu is used to modify the components of an object. To invoke this marking menu, select a component, press and hold the SHIFT key, and then right-click on the selected object; the marking menu will be displayed, as shown in Figure 1-67. After invoking this marking menu, you can choose the desired option to perform the corresponding function.

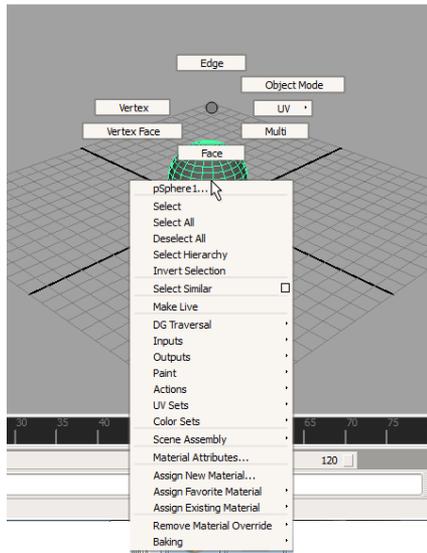


Figure 1-66 Marking menu displaying components of the selected object

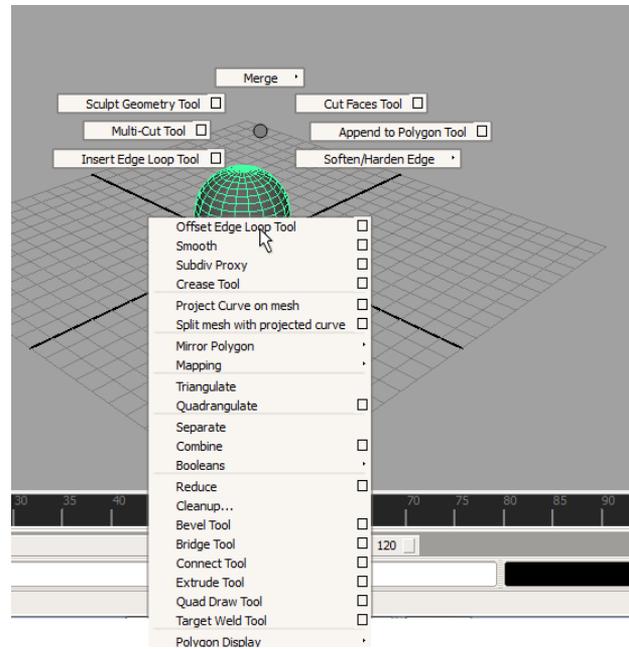


Figure 1-67 The marking menu displaying various tools for modifying an object

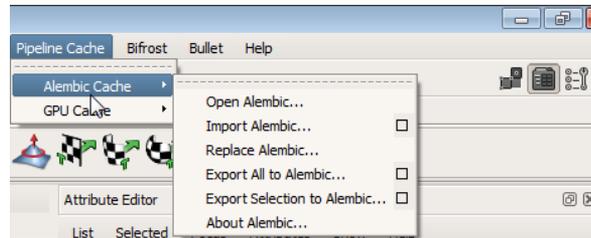
PIPELINE CACHING

In Maya, you can reduce the render time of a complex scene with the help of pipeline cache tools. Using these tools, you can also increase the loading speed of large 3D scenes. The two types of caching tools available in Maya are discussed next.

Alembic Cache

The **Alembic Cache** tool enables you to save and export complex Maya scenes in alembic file format. The alembic file format has been developed to represent a complex 3D geometry as a simple geometry. The exported alembic files can then be re-imported into Maya to improve playback performance and reduce memory usage. In order to access this tool, choose **Pipeline**

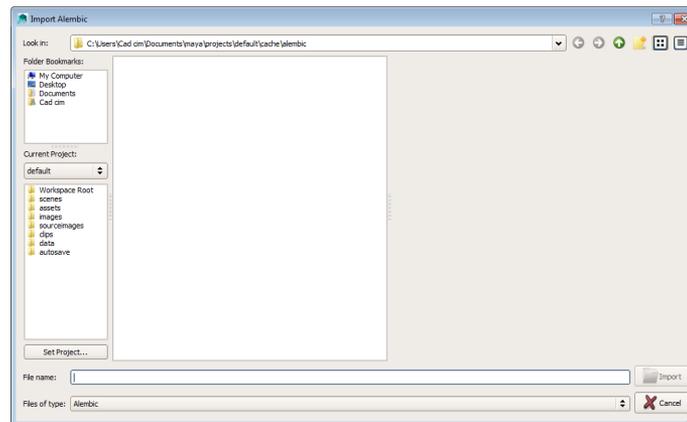
Cache > Alembic Cache from the menubar; a flyout will be displayed, as shown in Figure 1-68. Various options in this flyout are discussed next.



*Figure 1-68 Flyout displayed on choosing the **Alembic Cache** from the menubar*

Open Alembic

The **Open Alembic** option is used to open an alembic file in Maya. When you choose this option, the **Import Alembic** dialog box will be displayed, as shown in Figure 1-69. In this dialog box, you can browse to the location, where the required alembic file has been saved, and then you can open the file in Maya using the **Import** button.



*Figure 1-69 The **Import Alembic** dialog box*

Import Alembic

The **Import Alembic** option is used to import an alembic file in Maya. When you choose this option, the **Import Alembic** dialog box will be displayed. You can set various options in this dialog box for the file to be imported.

Replace Alembic

The **Replace Alembic** option is used to replace the selected 3D object with the alembic object contained in the selected alembic file.

Export all to Alembic

The **Export all to Alembic** option is used to export all objects in Maya scene as an alembic cache file. By default, alembic cache files are saved in the **cache > alembic** folder of the current Maya project folder.

Export Selection to Alembic

The **Export Selection to Alembic** option is used to export the selected objects in the Maya scene as alembic objects.

GPU Cache

The **GPU Cache** tools work similar to the **Alembic Cache** tools, with the only difference that the imported GPU file cannot be edited in Maya. However, in the alembic cache file, the geometry in the imported file can be edited.

INTEROPERABILITY OPTIONS IN MAYA

Autodesk Maya enables you to exchange data between Maya and different software such as 3ds Max, Softimage, MotionBuilder, and Mudbox. However, for exchanging data, the same version of the software must be available on your system. The **Send to 3ds Max**, **Send to Softimage**, **Send to MotionBuilder**, and **Send to Mudbox** options located in the **File** menu of the menubar are used to send a Maya file to the above mentioned software.



Note

*The **Send to 3ds Max**, **Send to Softimage**, **Send to MotionBuilder**, and **Send to Mudbox** options located in the **File** menu of the menubar will be displayed only if you have matching versions installed on your system. For example, 3ds Max 2015 and Maya 2015 are considered to be the matching versions.*

NAVIGATING THE VIEWPORTS

The persp view is the default camera view in Maya. To look around in a scene, you can move the virtual camera associated with the viewport. You can use the following shortcut keys while navigating the viewport.

Keyboard Shortcut	Function
ALT+MMB+Drag	Helps to pan the viewport
ALT+RMB+Drag	Helps to dolly in and out the viewport. You can also use the scroll wheel to dolly in and out.
ALT +LMB+Drag	Rotates or orbits the camera around in the persp window

Self-Evaluation Test

Answer the following questions and then compare them to those given at the end of this chapter:

- Which of the following combinations of shortcut keys is used to select a menuset drop-down list?
 - H+MMB
 - H+LMB
 - H+RMB
 - None of these

2. Which of the following windows is used to toggle the display of highlights of all menu items and tool icons?
 - (a) **1-Minute Startup Movies**
 - (b) The **Output window**
 - (c) **What's New Highlight Settings**
 - (d) None of these
3. The _____ tool is used to snap the selected object to the center of the other object.
4. The _____ option helps you select an object by entering its name in the **Name Selection** area.
5. The **Show or hide the Modeling Toolkit** button is used to toggle the _____ window.
6. The **Panel** menu has a set of _____ menus.
7. The keys set for animation are always displayed in red color. (T/F)
8. The MEL command is a group of text strings used for performing various actions in Maya. (T/F)
9. The Hotbox is used to assign the shortcut keys to the commands. (T/F)

Review Questions

Answer the following questions:

1. Which of the following tools helps you move the selected objects in a workspace from one place to another?
 - (a) **Translate Tool**
 - (b) **Paint Selection Tool**
 - (c) **Move Tool**
 - (d) **Scale Tool**
2. Which of the following combinations of shortcut keys is used to toggle the **Panel** menu on and off ?
 - (a) SHIFT+M
 - (b) CTRL+ SHIFT+M
 - (c) SHIFT+N
 - (d) CTRL+M
3. Which of the following shortcut keys is used to invoke the Hotbox?
 - (a) SPACEBAR
 - (b) BACKSPACE
 - (c) INSERT
 - (d) ESC
4. Hotkeys are also known as _____ keys.
5. The _____ button helps you set keyframes in animation.

6. The user-defined shortcuts can be created by using the _____ .
7. The _____ is an arbitrary point, which is used to determine the location of objects.
8. MEL stands for _____ .
9. The options in the **Animation Preferences** dialog box are used to modify the animation controls. (T/F)
10. The **Absolute transform** mode is used to move, rotate, and scale a selected object in the viewport. (T/F)

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Answers to Self-Evaluation Test

1. b, 2. c, 3. Snap to Projected Center, 4. Select by name, 5. Modeling Toolkit, 6. six, 7. T, 8. T, 9. F