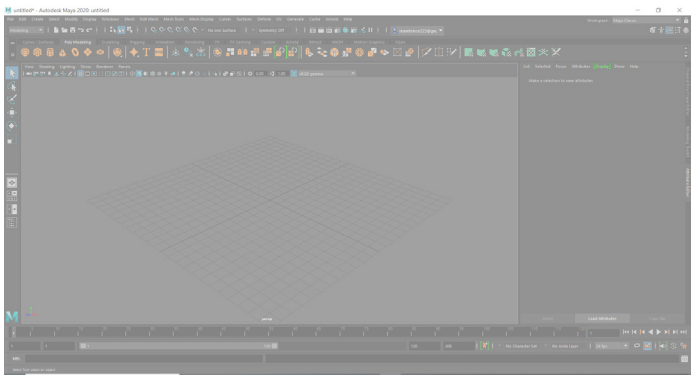
Chapter 1

Exploring Maya Interface

Learning Objectives

After completing this chapter, you will be able to:

- *Start Autodesk Maya 2020*
- *Work with menusets in Autodesk Maya*
- *Understand various terms related to Maya interface*
- *Work with tools in Autodesk Maya 2020*



INTRODUCTION TO Autodesk Maya

Welcome to the world of Autodesk Maya 2020. 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 2020 have been covered in this book.

STARTING Autodesk Maya 2020

To start Autodesk Maya 2020, double-click on the shortcut icon of Autodesk Maya 2020 displayed on the desktop of your computer, as shown in Figure 1-1. This icon is automatically created on installing Autodesk Maya 2020 on your computer.



Figure 1-1 *Starting Autodesk Maya 2020 by choosing the icon from desktop*

Double-click on the icon; three windows namely, **Output Window**, the main **Autodesk Maya 2020** interface window, and the **What's New Highlight Settings** window will be displayed on the screen. The **Output Window** is shown in Figure 1-2. By default, all the new tools and icons are highlighted in green in Maya 2020. The **What's New Highlight Settings** window, as shown in Figure 1-3, is used to toggle the visibility of these highlights.

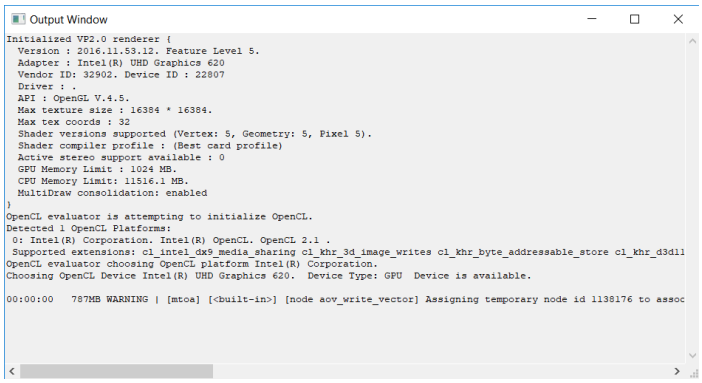


Figure 1-2 *The* ***Output Window***

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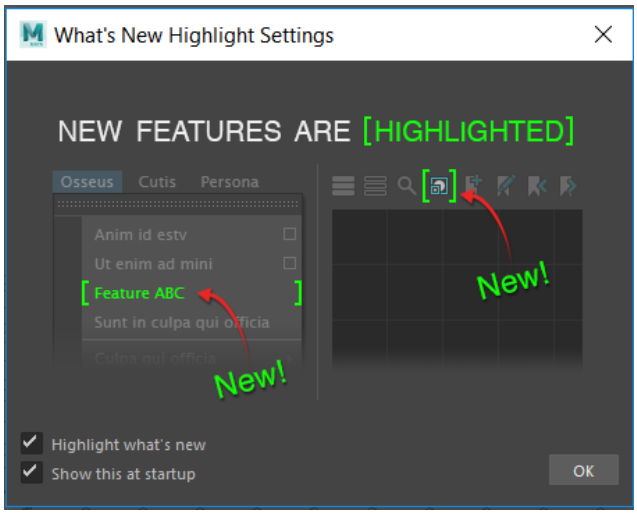


Figure 1-3 *The* ***What's New Highlight Settings*** *window*

Autodesk MAYA 2020 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 2020 for the first time, the persp viewport is displayed by default, refer to Figure 1-4. Workspace is the part or 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 2020 is divided into four viewports: top-Y, front-Z, side-X, 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 1-5 shows various components of the Maya interface.

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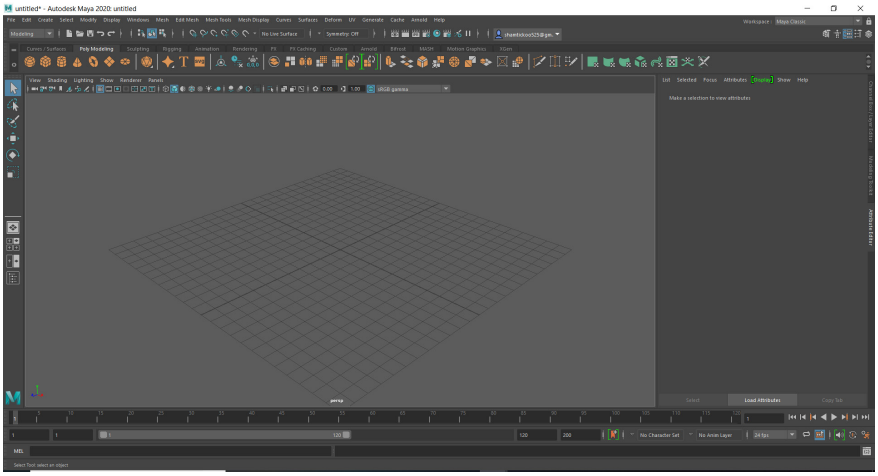


Figure 1-4 *The default interface of Autodesk Maya 2020 with persp viewport displayed*

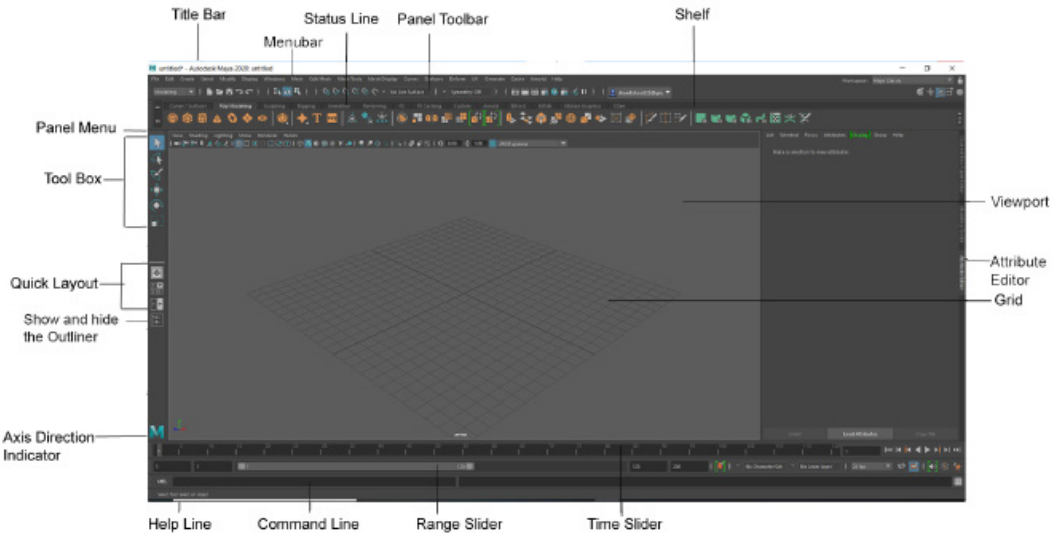


Figure 1-5 *Displaying various screen components of the Maya interface*

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*

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extension. The three buttons on the extreme right of title bar are used to minimize, maximize, and close the Autodesk Maya 2020 window, respectively. Various interface components of the Autodesk Maya 2020 interface are discussed next.



Tip

To toggle between single viewport and four viewport views, hover the cursor over one of the viewports 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, **Modeling**, **Rigging**, **Animation**, **FX**, and **Rendering**. 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 1-6 shows the menubar corresponding to the **Modeling** menuset.

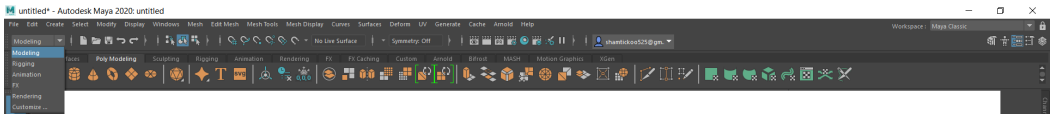


Figure 1-6 *Menubar displayed on choosing the* ***Modeling*** *menuset*

On invoking a menu from the menubar, a pull-down menu is displayed. On the right of some of the options in these pull-down menus, there are two types of demarcations, arrows and option boxes. When you click on an option box, a window will be displayed. You can use this window 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 (Modeling), F3 (Rigging), F4 (Animation), F5 (FX), 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. The Status Line consists of different graphical icons. The graphical icons are further grouped and these groups are separated by 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 1-7. 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 into 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 buttons are discussed next.



Figure 1-7 *The Status Line*

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Menuset

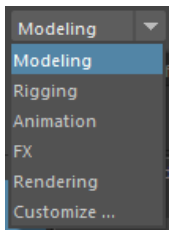


*Figure 1-8 The **Menuset** drop-down list*

As mentioned earlier, the **Menuset** drop-down list in the Status Line has different menusets such as **Modeling**, **Rigging**, **Animation**, **FX**, and **Rendering**, as shown in Figure 1-8. 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 the commands related to it will be displayed in the menus of the menubar. You can add a custom menuset by selecting the **Customize** option. On selecting it, the **Menu Set Editor** window will be displayed, as shown in Figure 1-9. To create a new menuset, choose the **New Menu Set** button from this window; the **Create New Menu Set** window will be displayed. Enter the menu name in **Enter name** edit box and then choose the **Create** button; the new menuset will be added in the **Menu sets** area of the window. To add a menu in the **Menus in menu set** area, select the desired menu items from the **All menus** area and right-click on it. Next, choose **Add to Menu Set** from the shortcut menu displayed; the selected menu items will be added to the **Menus in menu set** area. Now, choose the **Close Window** button to close the window.

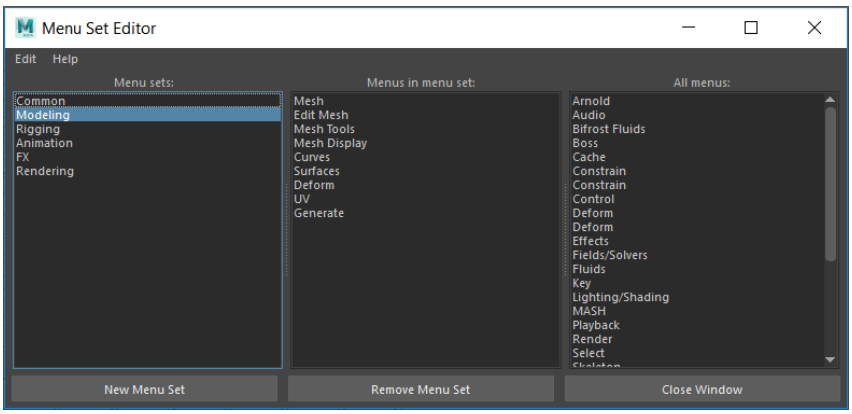


*Figure 1-9 The **Menu Set Editor** window*

File Buttons Group

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

Create a new scene

The **New scene** button is used to create a new scene. To do so, choose the **New scene** button from the Status Line; the **Warning: Scene Not Saved** message box will be displayed with the **Save changes to untitled scene?** message, 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.

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Figure 1-10 The File Buttons group

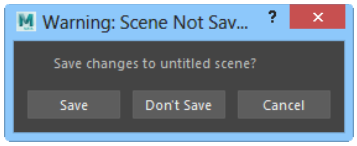


*Figure 1-11 The **Warning: Scene Not Saved** message box*

Open scene

The **Open scene** button is used to open a file created earlier. To do so, 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.

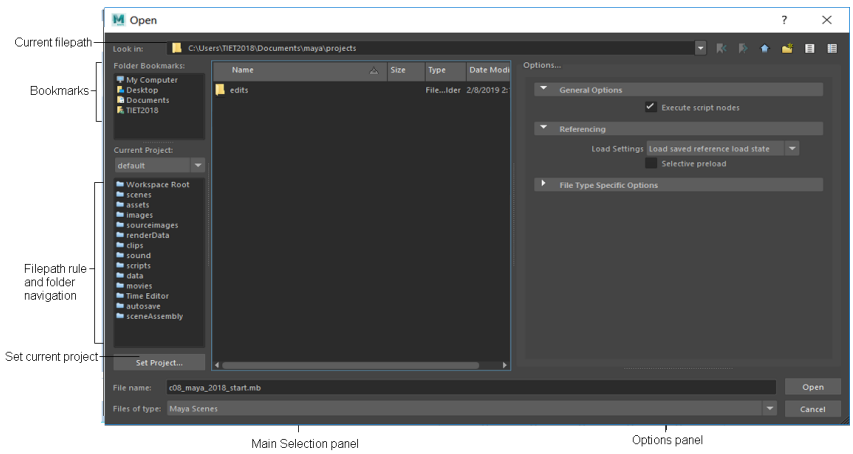


*Figure 1-12 The **Open** dialog box*

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.

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** will be 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.

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Undo the last action/Redo the last undone action



The **Undo the last action** button is used to remove the last applied action and the **Redo the last undone action** button is used to apply the last undone action again.

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 group comprises of three buttons that are discussed next.

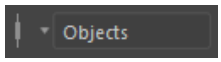


Figure 1-13 *The Selection set icons group*

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 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.

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.



Tip

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

Selection Mask Icons Group

The Selection Mask 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 mask 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.



Figure 1-14 *The Selection Mask Icons group displayed on choosing the* ***Select by hierarchy and combinations*** *button*

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

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either the entire object, or its components, refer to Figures 1-15 and 1-16. 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 1-15 *The Selection Mask Icons group displayed on choosing the* ***Select by component type*** *button*



Figure 1-16 *The Selection Mask Icons 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 the 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.

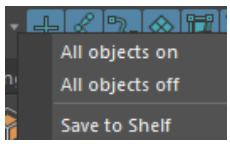


Figure 1-17 *Flyout displayed on choosing the* ***Set the object selection mask*** *button*



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 button 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 the 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.

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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 selection so that left mouse button acts on the manipulators instead of selecting objects. 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 is on



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

Snap Buttons Group

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

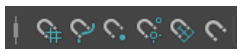


Figure 1-18 *The Snap Buttons group*

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 > Objects > 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.

Snap to curves



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

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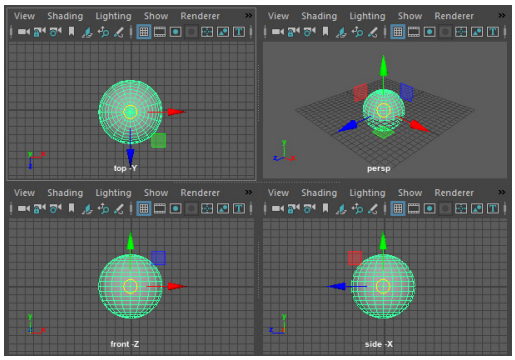


Figure 1-19 *The sphere snapped to the closest grid intersection point*

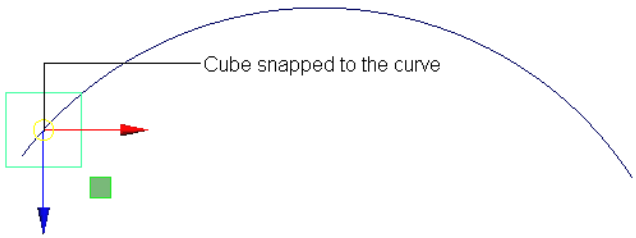


Figure 1-20 *The cube snapped to the curve*

Snap to points



The **Snap to points** button is used to snap the selected objects to the closest control vertex or pivot point. For example, to snap a cube to the vertices of a polygonal plane, choose **Create > Objects > 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** button 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** button 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 > Objects > Polygon Primitives > Plane** from the menubar and drag the cursor; a plane will be created. Next, choose **Create > Construction Aids > Locator** from the menubar; a locator will be created. Now, select the locator and choose the **Snap to Projected Center** button from the Status Line; the locator will snap to the center of the polygonal plane.

Snap to view planes



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

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Tip

You can also use the shortcut keys to perform a particular snap function. For example, press X for ***Snap to grids****, C for* ***Snap to curves****, and V for the* ***Snap to points*** *buttons.*

Make the selected object live



The **Make the selected object live** button 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 > Objects > 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** button from the Status Line; the sphere will appear in green wireframe. Now, choose **Create > Objects > 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 in the Status Line helps you 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** button 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** button is used to select and edit the output operations of an object.

Construction history on/off



The **Construction history on/off** button 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, you can deactivate this option.

Render Tools Group

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

Display rendering image



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

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Render the current frame



The **Render the current frame** button is used to render the selected viewport at the current frame using the **Arnold** renderer. Choose the **Render the current frame** button 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 **Output Window** will display all the rendering calculations made for rendering the active scene, refer to Figure 1-22.

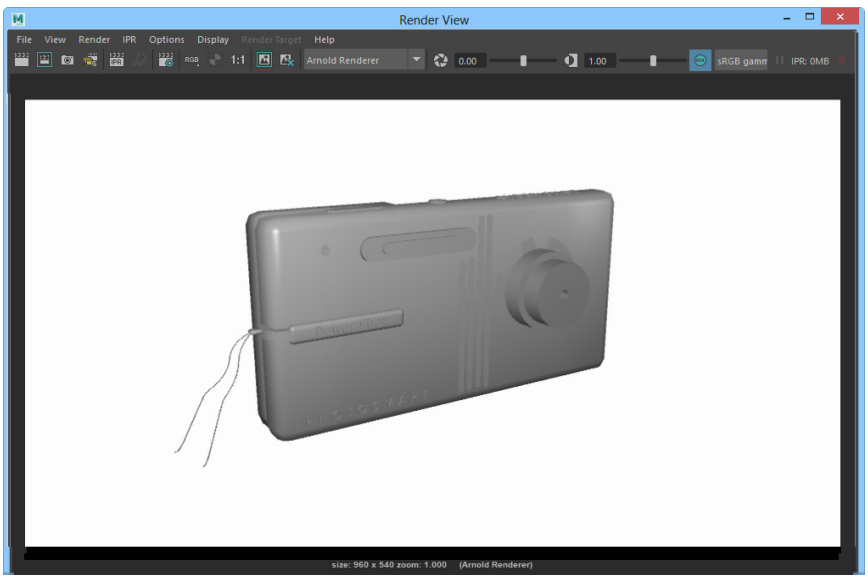


Figure 1-21 *The* ***Render View*** *window*

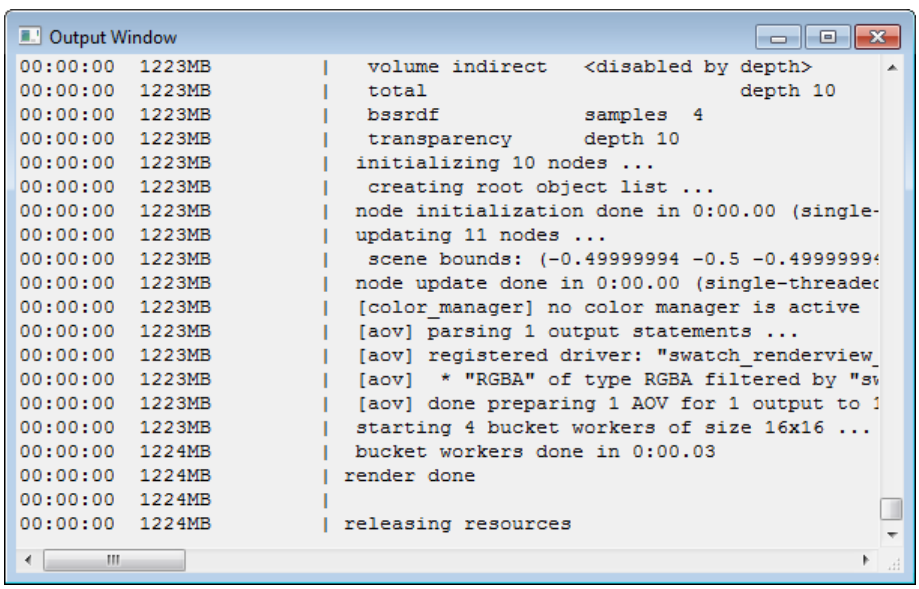


Figure 1-22 *The* ***Output Window***

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IPR render the current frame



The **IPR render the current frame** button 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 **Attribute Editor**, the selected part will be rendered automatically.

Display render settings



On choosing the **Display render settings** button, 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.

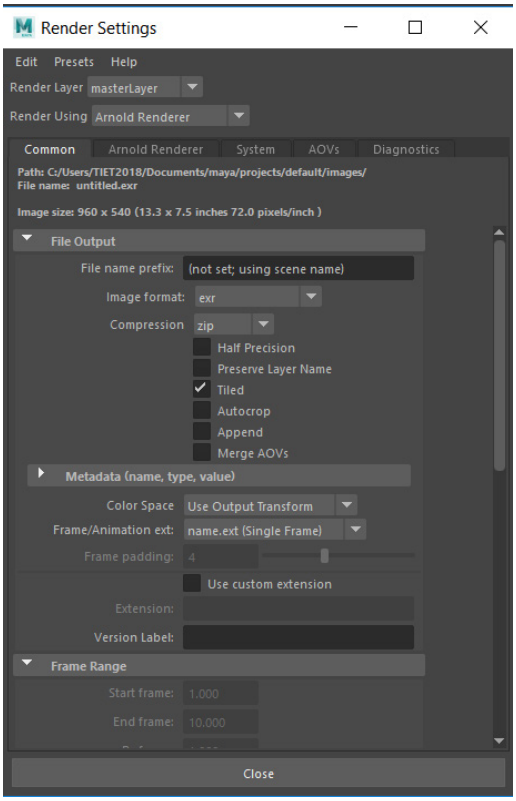


Figure 1-23 *The* ***Render Settings*** *window*

Display Hypershade



On choosing this button, the **Hypershade** window will be displayed. Using this window, you can create shading networks. The **Hypershade** window is discussed in detail in the later chapters.

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Launch Render Setup



On choosing this button, the **Render Setup Editor** window will be displayed, with the **Render Setup** editor on the left and the **Property Editor** on the right. The **Render Setup** editor allows you to create layers, collections and overrides, whereas the **Property Editor** allows you to set their corresponding values.

Open the Light Editor



On choosing this button, the **Light Editor (Global Mode)** window will be displayed. This window lists all lights in the scene with commonly used attributes for each light.

Toggle pausing Viewport 2 display update



This button is used to pause Viewport 2 display update.

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 this group 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 active. The transform 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, refer to 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.

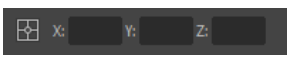


Figure 1-24 *The **Absolute transform** area*

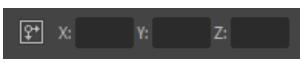


Figure 1-25 *The **Relative transform** area*

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.

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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 1-26 The **Rename** area*



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

Autodesk Store Group

There is a drop-down list in this group that has three options: **Sign In**, **Explore Purchase Options**, and **Manage License**. The **Sign In** option is used to sign in to the Autodesk account. On selecting **Explore Purchase Options** from this drop-down list, open the Autodesk Store web page from where you can buy various Autodesk products.

The **Manage License** option will open the **License Manager** that you can use to manage Maya license.

Sidebar Buttons Group

The toggle buttons in the Sidebar Buttons group are used to invoke tools, editors, and windows. The buttons in this group 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** window is used to perform multiple modeling specific operations.

Toggle the Character Control



The **Toggle the Character Control** button is used to open the **Human IK** window, as shown in Figure 1-29. The tools in this window allow you to define and control multiple character setups in a single window.

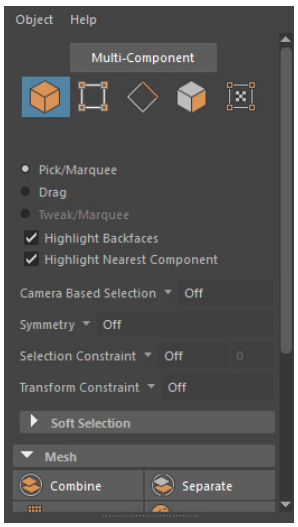


*Figure 1-28 The **Modeling Toolkit** window*

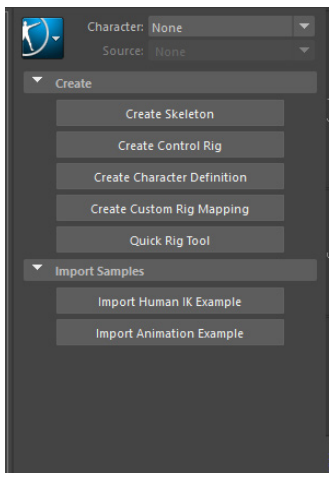


*Figure 1-29 The **Human IK** window*

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Show/Hide Attribute Editor



The **Show/Hide Attribute Editor** button is used to toggle the visibility of the **Attribute Editor**, refer to Figure 1-30. The **Attribute Editor** is used to control different properties of the selected object.

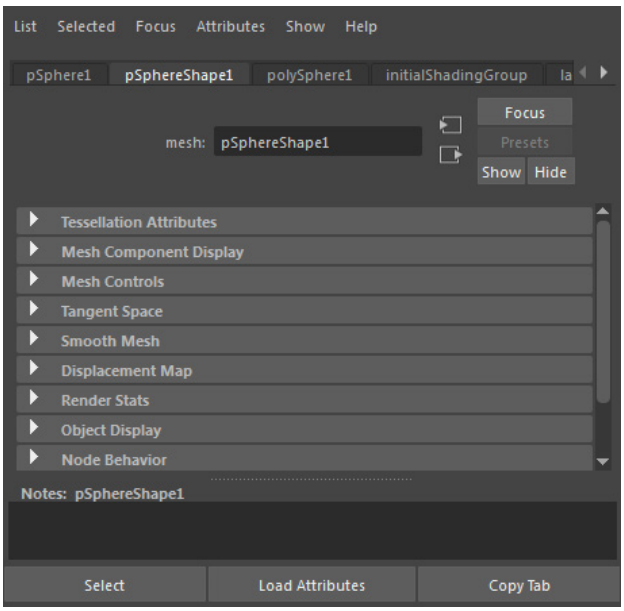


Figure 1-30 *The* ***Attribute Editor***

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. 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 1-31.

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/Hide 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 1-32. 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.



Note

By default, the keyable attributes of selected object(s) are displayed in the ***Channel Box****. To add more attributes to it, choose* ***Windows > Editors > 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 Displayed****. To add attributes, select them from the* ***Nonkeyable Hidden*** *area and then choose the* ***Move >>*** *button. Next, choose the* ***Close*** *button.*

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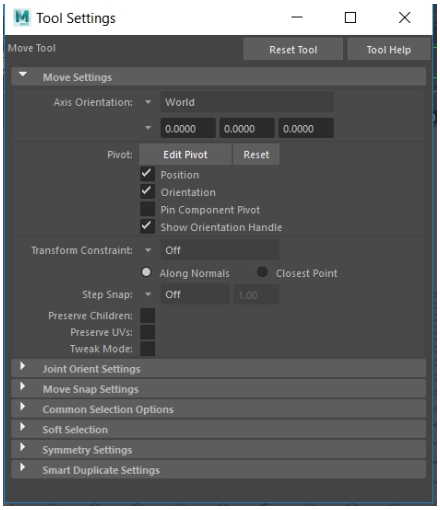


*Figure 1-31 The **Tool Settings (Move Tool)** window*

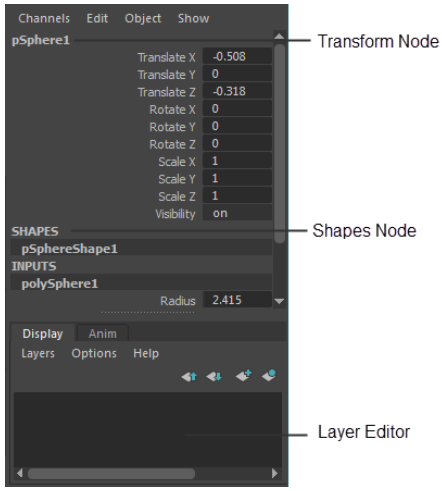


*Figure 1-32 The **Channel Box / Layer Editor***

Shelf

The Shelf is located below the Status Line, as shown in Figure 1-33. 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 1-33.



Figure 1-33 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 1-34; a flyout will be displayed, as shown in Figure 1-34. Various options in this flyout are discussed next.

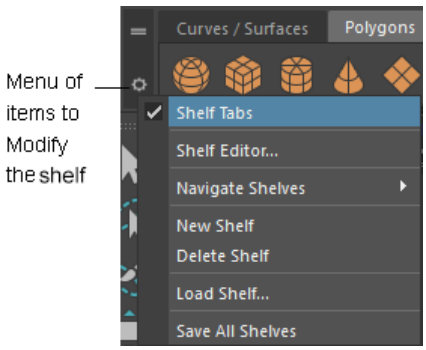


*Figure 1-34 Flyout displayed on choosing the **Menu of items to modify the shelf** button*

Shelf Tabs

The **Shelf Tabs** option is used to toggle the visibility of the Shelf tabs. On choosing this option, the Shelfs 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 1-35. Alternatively, you can choose **Windows > Editors > 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**.

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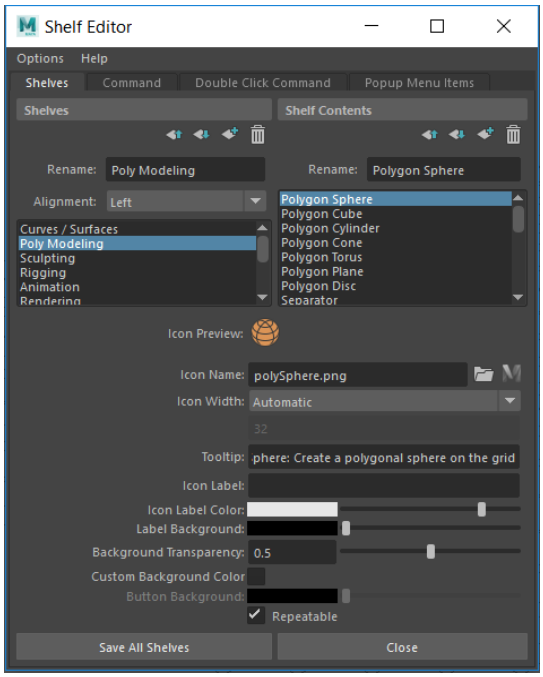


*Figure 1-35 The **Shelf Editor***

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 1-36. The options in the cascading menu are discussed next.

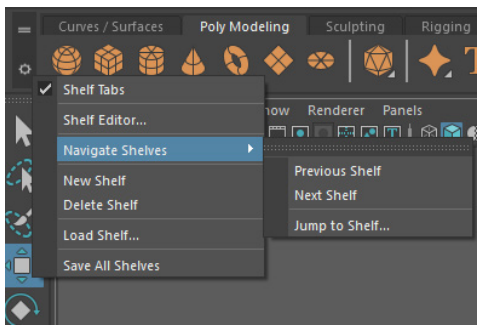


*Figure 1-36 Cascading menu displayed on choosing the **Navigate Shelves** option*

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 **Animation** tab is chosen displaying the dynamic specific icons.

Next Shelf

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

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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** window will be displayed, as shown in Figure 1-37. 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.

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** window will be displayed, as shown in Figure 1-38. Enter a name for the new Shelf and choose the **OK** button; a new Shelf will be created, as shown in Figure 1-39. 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.

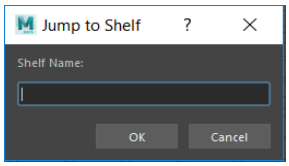


Figure 1-37 *The* ***Jump to Shelf*** *window*

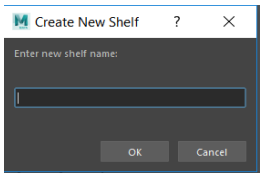


Figure 1-38 *The* ***Create New Shelf*** *window*

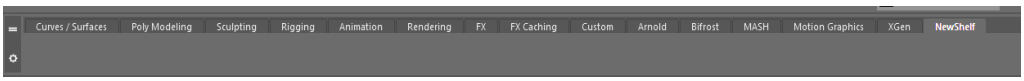


Figure 1-39 *A new Shelf added*

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 1-40. Choose the **OK** button to delete the selected Shelf.

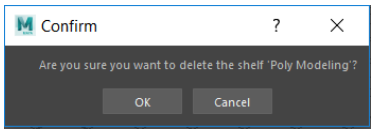


Figure 1-40 *The* ***Confirm*** *message box*

Load Shelf

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

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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 the 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, invoke the **Select Tool** and then press and hold the right mouse button; 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 left 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 or Hide the 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 > Objects > Polygon Primitives > Sphere** from the menubar.

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

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object with three color handles, as shown in Figure 1-41. 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 1-42. Change the settings as per your requirement in this window.

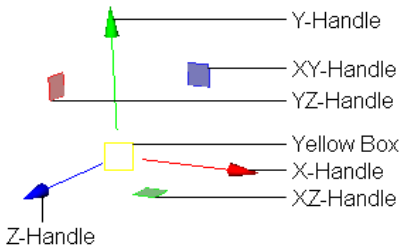


Figure 1-41 *The* ***Move Tool*** *manipulator*

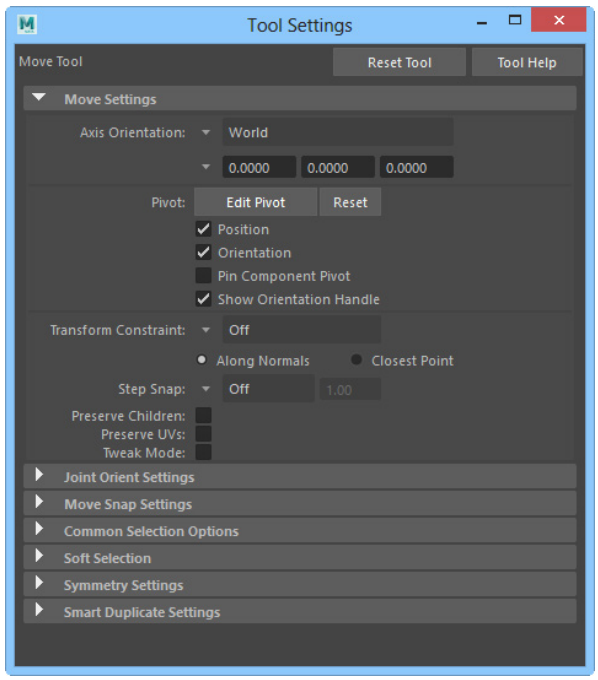


Figure 1-42 *The* ***Tool Settings (Move Tool)*** *window*

By default, the pivot point is located at the center of the object. To change the pivot point, 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 1-43. Move the pivot point to adjust its position. You can also put the pivot at the center of the object. To do so, choose **Modify > Pivot > Center Pivot** from the menubar; 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.

Note

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

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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 1-44. 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 1-45. This window contains various options for rotation. You can change the settings in this window as required.

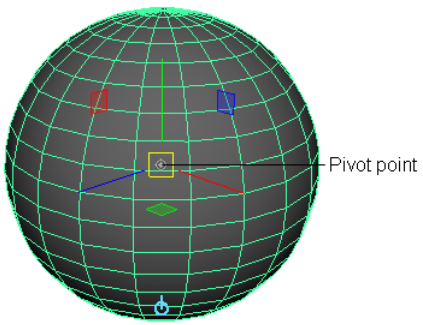


Figure 1-43 *The pivot point*

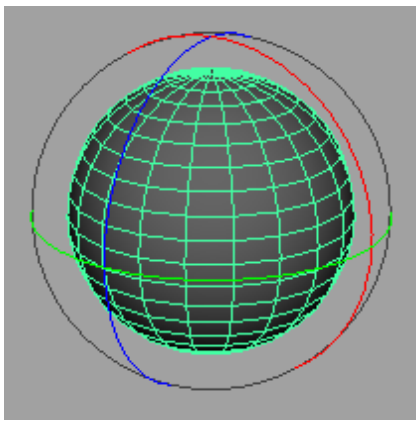


Figure 1-44 *The* ***Rotate Tool*** *manipulator*

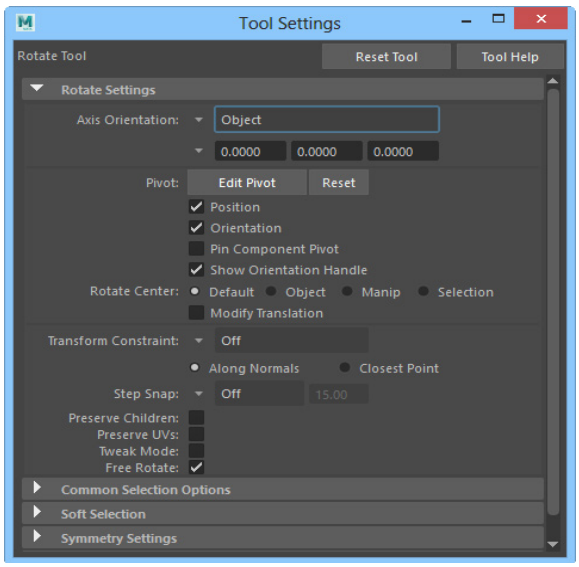


Figure 1-45 *Partial view of the* ***Tool Settings (Rotate Tool)*** *window*

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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; the **Scale Tool** manipulator will be displayed on the object, as shown in Figure 1-46.

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 1-47. Make the required changes in the **Tool Settings (Scale Tool)** window to adjust the basic attributes of **Scale Tool**.

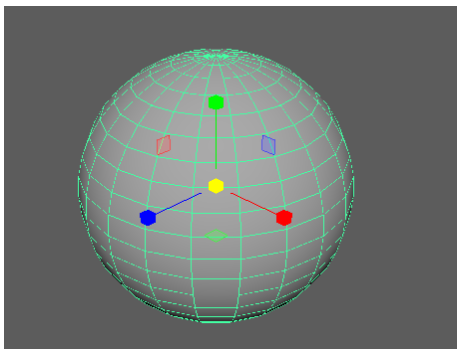


Figure 1-46 *The* ***Scale Tool*** *manipulator*

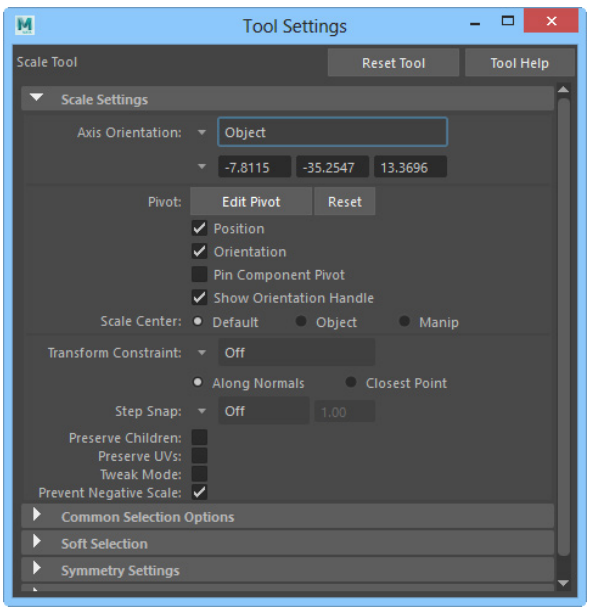


Figure 1-47 *Partial view of the* ***Tool Settings (Scale Tool)*** *window*

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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 or currently active tool.

Quick Layout Buttons

Using the buttons in the Quick Layout buttons area, refer to Figure 1-5, you can the 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 1-48. 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 1-49.

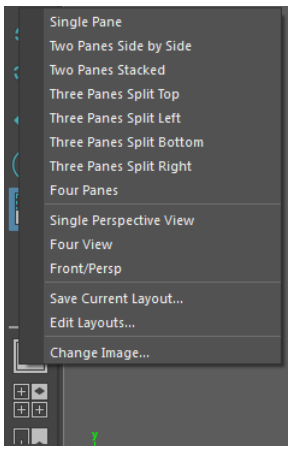


Figure 1-48 *The shortcut menu with various layout options*

Time Slider and Range Slider



The Time Slider and the Range Slider, as shown in Figure 1-50, 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.

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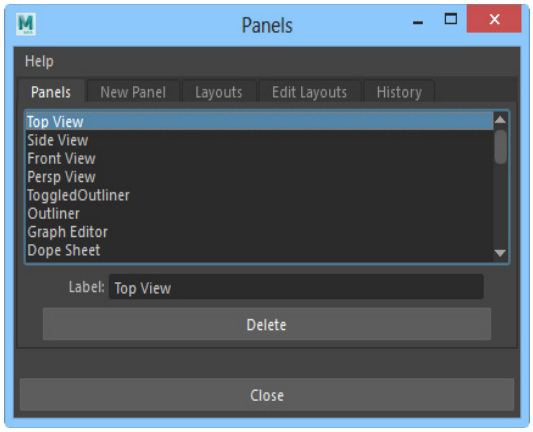


Figure 1-49 *The* ***Panels*** *window*

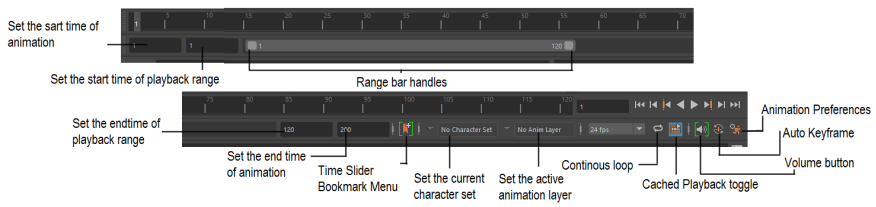


Figure 1-50 *The Time Slider and the Range Slider*

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 ***Key > Set > Set key*** *from the menubar or by pressing the 's' key. You need to ensure that you have selected the* ***Animation*** *menuset.*

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 blue when it is activated.

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Volume



In Maya 2020, the **Volume** button is added and it is used to adjust the sound in the scene. When you click on this button, a slider is displayed to adjust the sound level. If you double-click on this button, sound is turned off and the button icon modifies to show muted sound. Right-click on this button; a shortcut menu will be displayed. The options in this shortcut menu are used to perform various operations such as to import audio into the scene, delete audio from the scene, mute audio, and so on. You can also use the option in the shortcut menu to display the method in which the audio waveform will be displayed on the Time Slider. The options in this shortcut menu are also available in the new **Audio** menu added in the menubar. The **Audio** menu is visible when you select **Animation** from the **Menuset** drop-down list in the Status Line.

Time Slider Bookmark Menu



In Maya 2020, the **Time Slider Bookmark Menu** button is added. Right-click on this button; a shortcut menu will be displayed. Next, choose the desired option to create, edit, show, delete, frame bookmarks, and so on.

Animation preferences



The **Animation preferences** button is used to modify the animation controls. On choosing this button, the **Preferences** window will be displayed, as shown in Figure 1-51. In the **Preferences** window, 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 window.

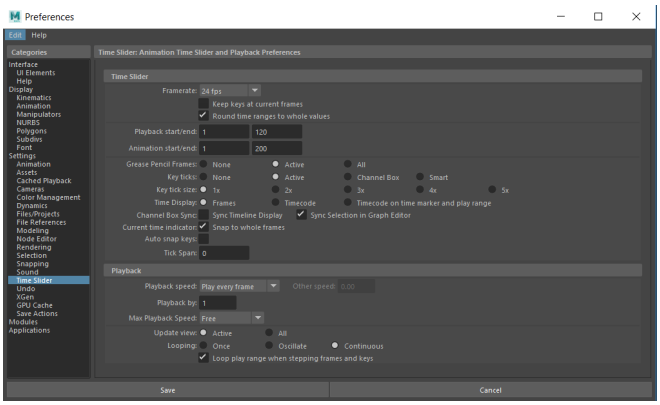


Figure 1-51 *The* ***Preferences*** *window*

Cached Playback



The **Cached Playback** button is used to play the animation speedily without the need to create a playblast. Cached playback is the process that continuously evaluates the animation and helps to speed up the animation playback in the viewport. By default a blue line appears running along the bottom of the Time Slider that represents animation catche status line. In Maya 2020, when the **Cached dynamics** option is turned on, the pink line also runs along the bottom of the Time slider. This line represents the dynamic status line.

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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.

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.



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.*

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 1-52. The commands or options in the **Panel** menu control all the actions performed in the workspace. The **Panel** menu comprises of six menus, which are discussed next.

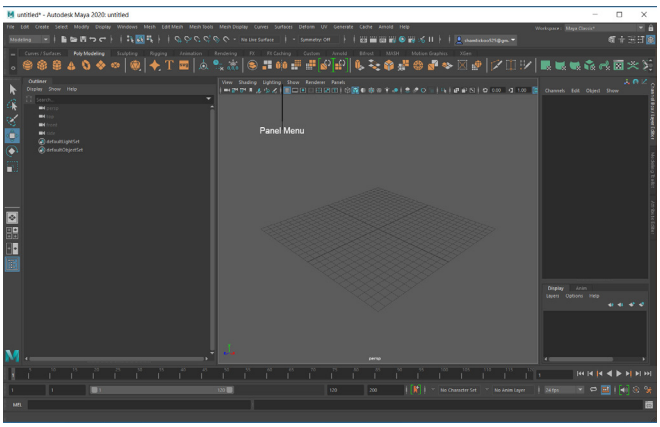


***Figure 1-52** The **Panel** menu*

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.

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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 1-53, 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.

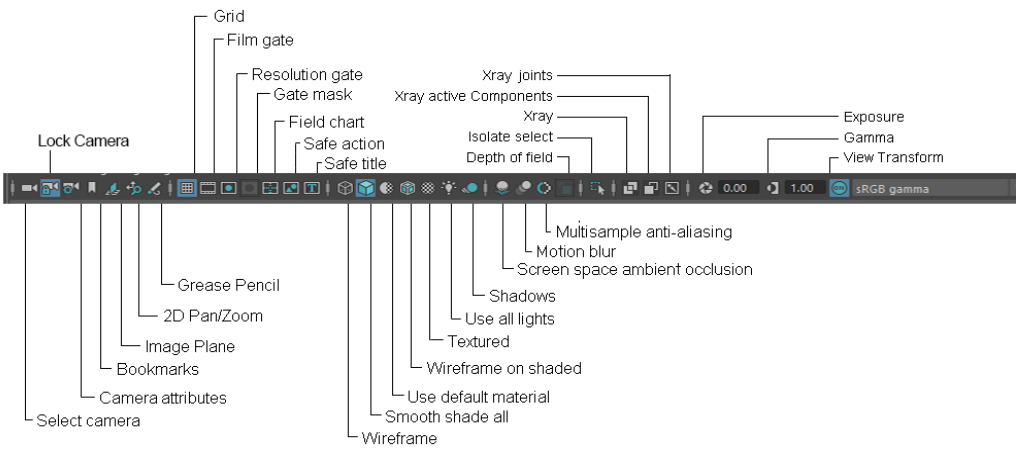


Figure 1-53 *The* ***Panel*** *toolbar*

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 1-54. Now, you can switch to the desired camera views by choosing the corresponding option from the shortcut menu.

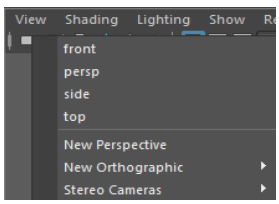


Figure 1-54 *The shortcut menu displayed on right-clicking on the* ***Select camera*** *tool*

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Lock Camera

The **Lock Camera** tool is used to lock the active camera in a viewport. When camera is locked, you can not change its transform properties such as translate and rotation. To unlock the camera, choose the **Lock Camera** tool again.

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 **Bookmark** tool; a shortcut menu with a list of bookmarks created will be displayed in the Panel toolbar. Choose the **Edit 2D Bookmarks** option from this shortcut menu. On doing so, the **Bookmark Editor (persp)** window will be displayed, as shown in Figure 1-55. You can change the name and other attributes of the selected bookmark from this window.

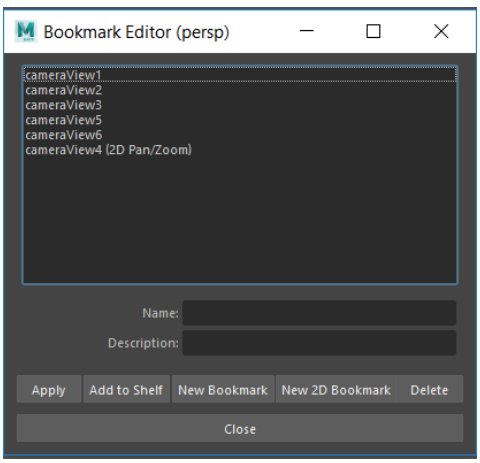


Figure 1-55 *The* ***Bookmark Editor (persp)*** *window*

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.

2D Pan/Zoom

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

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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 1-56. You can also invoke this tool by choosing **View > Camera Tools > Grease Pencil Tool** from the **Panel** menu.

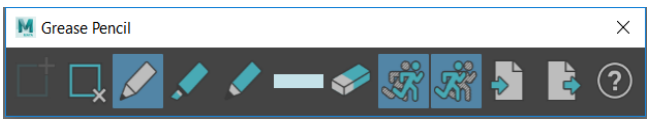


Figure 1-56 *The* ***Grease Pencil*** *window*

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** window will be displayed, as shown in Figure 1-57. Next, you can set the grid attributes in this window as per your requirement.

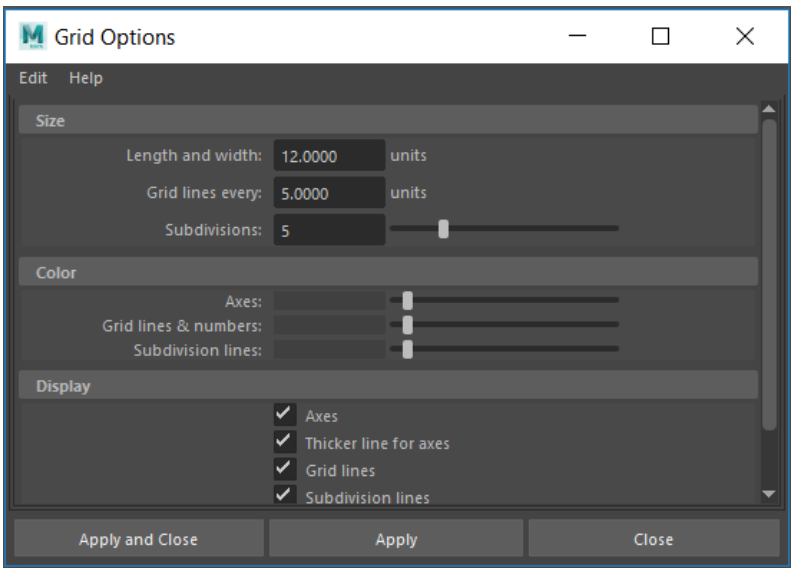


Figure 1-57 *The* ***Grid Options*** *window*

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.

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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. 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.

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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 > X-Ray 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 > X-Ray joints** from the **Panel** menu.

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Exposure



The **Exposure** tool is used to adjust the brightness of the display.

Gamma

The **Gamma** tool is used to adjust the contrast or brightness of the midtones in the image.

View Transform

The **View Transform** tool is used to change the working color space to display. To do so, choose color space use the drop-down list and choose a difference view transform.



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 **Windows > Editors > General Editors > 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 1-58. The **Channel Box** is further divided into three parts, which are discussed next.

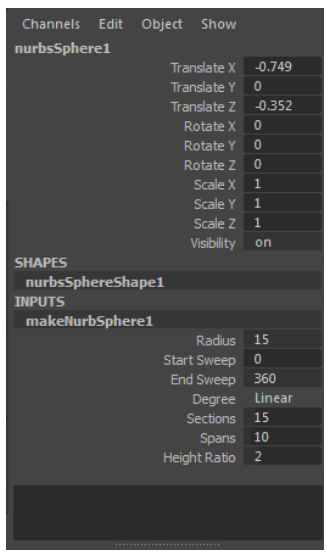


Figure 1-58** The **Channel Box /Layer Editor

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 1-58, **nurbsSphere1** is the **Transform** node of a NURBS sphere. Enter the transform values in different transform parameters 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 1-58. For example, when you create a NURBS sphere in the viewport, it is named as **nurbsSphereShape1**. Here, NURBS indicates that the object has

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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 1-58. 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**, refer to Figure 1-59; 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.

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** window will be displayed, as shown in Figure 1-60. 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 window enables you to select a color for the layer to give it a distinct identity as compared to other layers.

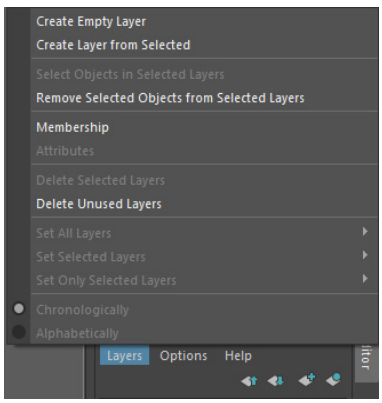


Figure 1-59 *Creating a new layer in the* ***Layer Editor***

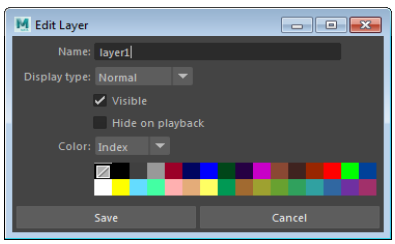


Figure 1-60 *The* ***Edit Layer*** *window*

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 **Windows > Editors > General Editors > Attribute Editor** from the

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menubar; the **Attribute Editor** will be displayed on the right of the viewport, refer to Figure 1-61. The **Attribute Editor** comprises of a number of attribute tabs that help you modify an object.

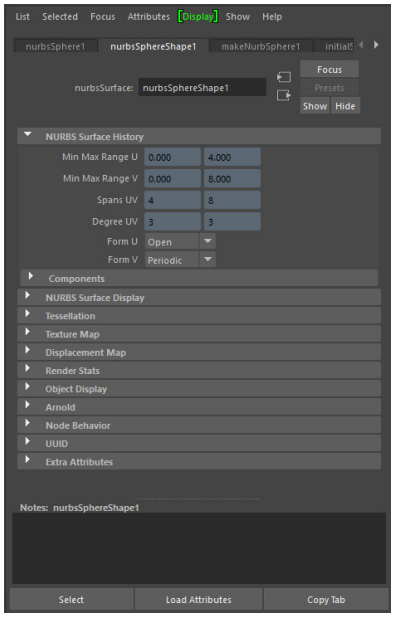


Figure 1-61 *The* ***Attribute Editor***

HOTKEYS

In Maya, you can create your own shortcut keys or even change default shortcuts. To do so, choose **Windows > Editors > Settings/Preferences > Hotkey Editor** from the menubar; the **Hotkey Editor** will be displayed, as shown in Figure 1-62. To edit hotkeys, select a hotkey category from the **Edit Hotkeys For** drop-down list. Now, find the desired command from the list displayed below the **Edit Hotkeys For** drop-down list. Click on the command and then enter a keyboard shortcut.

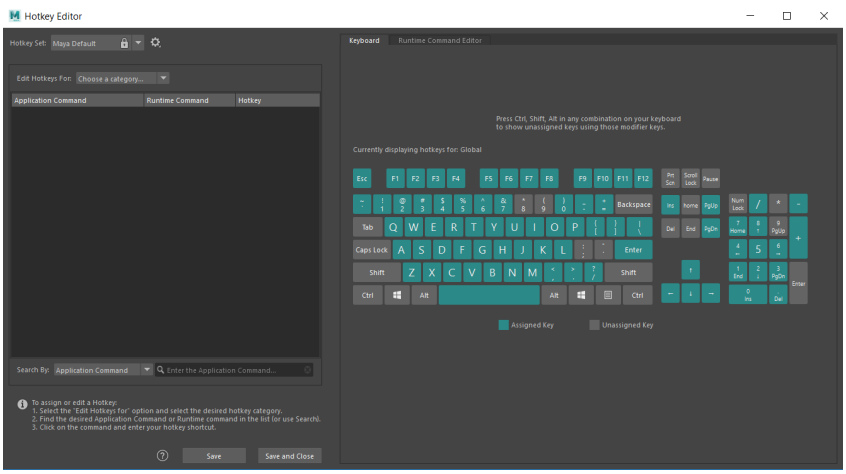


Figure 1-62 *The* ***Hotkey Editor***

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You can search an application command by choosing the **Search By** text box. Enter the application command name in the search bar; filtered items will be displayed, as shown in Figure 1-63. At the right side of the **Hotkey Editor**, the **Keyboard** tab will be displayed. In this tab, the unassigned keys are highlighted in cyan color.

HOTBOX

Hotbox, as shown in Figure 1-64, 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, refer to Figure 1-64.

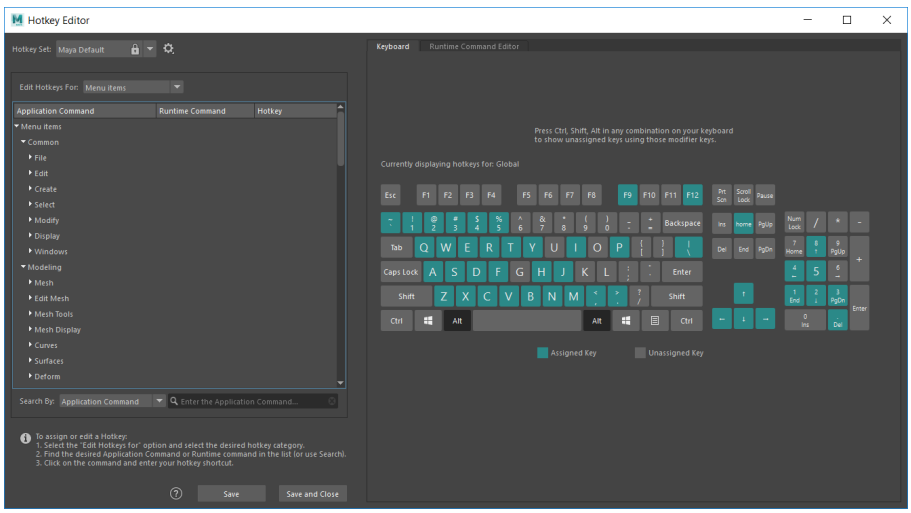


Figure 1-63 *Using the* ***Search By*** *filter*

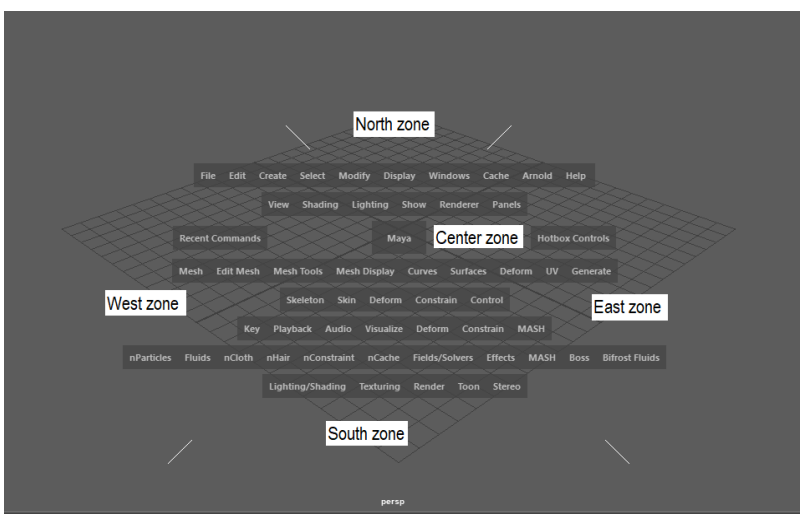


Figure 1-64 *The Hotbox*

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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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OUTLINER

The **Outliner** window is used to display all the objects of a scene in a hierarchical manner, as shown in Figure 1-65. 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 the 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 text 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 the 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.

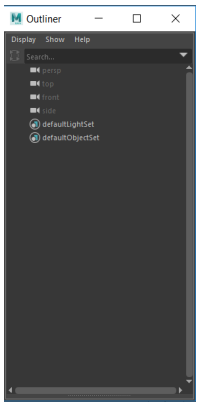


Figure 1-65 *Objects displayed in the* ***Outliner*** *window*

MARKING MENUS

Marking menus are similar to shortcut menus that consist of almost all the 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 1-66. In this marking menu, choose the object that you want to create.

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 1-67. Now, you can select the desired component of the selected object. This marking menu can also be used to apply material 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, refer to Figure 1-68. After invoking this marking menu, you can choose the desired option to perform the corresponding function.

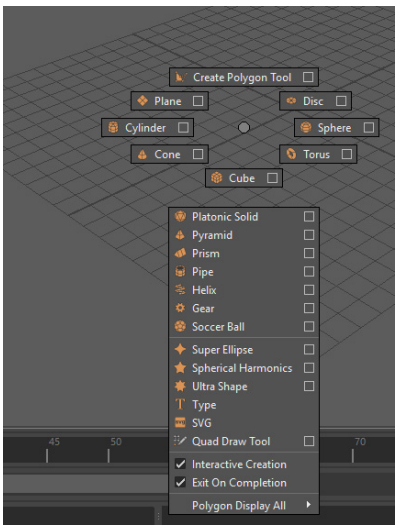


Figure 1-66 *Marking menu displaying options used for creating default objects*

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 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 **Cache > Alembic Cache** from the menubar; a flyout will be displayed, as shown in Figure 1-69. Various options in this flyout are discussed next.



Note

*The **Alembic Cache** tool is not available by default. To invoke this tool, run the following script in Command Line: global proc perFrameCallback(int $frame){print $frame;}*

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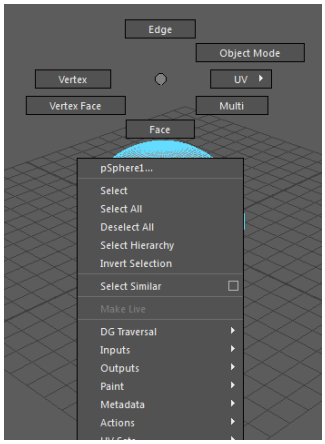


Figure 1-67 *Marking menu displaying components of the selected object*

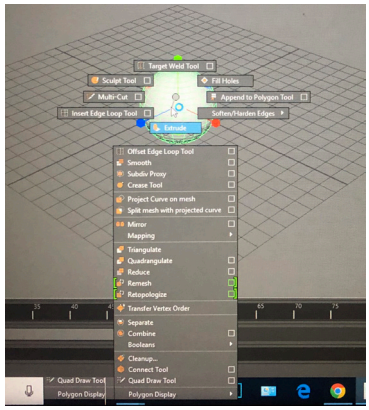


Figure 1-68 *The marking menu displaying various tools for modifying an object*

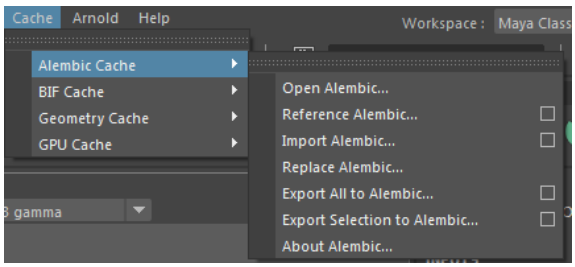


Figure 1-69 *Flyout displayed on choosing the* ***Alembic Cache*** *tool from the menubar*

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. 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.

Reference Alembic

The **Reference Alembic** option is used to import the contents of a scene, including objects, animation, and shaders into your currently opened scene without importing the files into the scene.

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.

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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.

INTEROPERABILITY OPTIONS IN MAYA

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



Note

*The **Send to 3ds Max** option 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 2020 and Maya 2020 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 in the persp window

New Hotkeys Introduced in Maya 2020



In Maya 2020, new hotkeys are introduced to speed up the task. There are hotkeys for selecting previous and next keyframes, toggle hotkeys to show/hide controllers, turning on/off NURBS curves. Some hotkeys are used to quickly cycle between x-ray modes to see joints, controls, and characters. Also, some hotkeys are used to nudge selected keys to the left or right easily.

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Keyboard Shortcut	Function
ALT +1	Show/hide nurbs Curves
ALT+ 2	Show/hide Polygon Meshes
ALT+ 4	Show/hide Image Planes
ALT+ 5	Show/hide Wireframe on Shaded
ALT + a	Display Cycle Rig
SHIFT + 9	Nudge Left
SHIFT + 0	Nudge Right
CTRL + ALT + ,	Select previous keyframe
CTRL+ ALT+ .	Select next keyframe

TIPS AND TRICKS IN MAYA



There are many hidden features in Maya that the new users are not aware of. We have provided information of some of these hidden features in the form of tips and tricks below. These tips and tricks will help every Maya user to work efficiently.

- Choose **Windows > Editors > Settings & Preferences > Plug-in Manager** from the menubar; the **Plug-in Manager** window will be displayed. Clear the check boxes that you don't need. It will speed up Maya's boot time.

- For copying the polygon objects, select the object and press CTRL +D. Next, press W to activate **Move Tool** and move the copied object to the desired position. Next, press SHIFT+D to copy the object to the same distance.

- You can increase or decrease the size of gyro using the + and - keys, respectively. These keys are displayed on choosing **Move Tool**, **Rotate Tool**, or **Scale Tool**.

- If you want to change the background color of viewport, hold down the ALT key, and press B.

- If you want to smoothen the low poly model without increasing the subdivision level, press 3.

- If you want to modify only specific area of an object, activate the vertex mode and then select vertices of that area and press B; the **Soft Selection** mode is activated and selected vertices turn red and yellow. Now, edit that area. You can increase and decrease the area by holding down the B key and the left mouse button and dragging.

- A high poly count model slows the speed of your workflow. To track the poly count of the model, you need to turn on the poly count option. To do so, choose **Display > Viewport > Heads Up Display > Poly Count** from the menubar.

- If you have a scene with light setup and you want to know the realtime result then press 7 to see the light effect in the viewport.

- If you want to aim your light on an object, press T; the aim is displayed. Now, you can aim the light on the object.

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- You can use following shortcut keys to avoid going through the menus:
  Press 4 to activate the wireframe mode. Press 5 to activate the shaded mode. Press 6 to activate the texture mode. Press 7 to make the light option on. Press 8 to activate the paint effects.

- To rotate an object in radial direction, hold down the J key and drag; the object snaps in 15 degrees.

- If you want to hide certain objects while you are working, select the object and press CTRL+H. For displaying all hidden objects, choose **Display >Object >Show >All** from the menubar.

WORKSPACES

Workspaces are arrangement of windows, panels, and other interface elements. Maya comes with several predefined workspaces that you can access from the **Workspaces** drop-down list available on the far right of the menubar, as shown in Figure 1-70.

You can also save your own workspaces or reset the factory workspaces. To do so, choose the options available in the **Windows > Workspaces** menu.

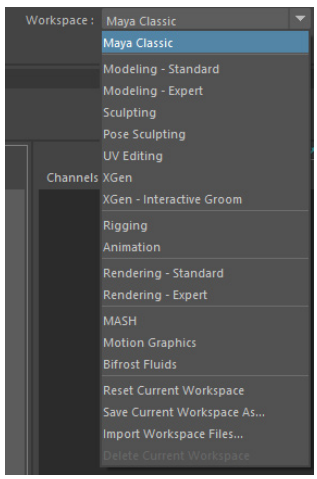


Figure 1-70 *Partial view of the* ***Workspace*** *drop-down list*

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Self-Evaluation Test

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

1. 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

2. Which of the following tools is used to adjust contrast or brightness of an image?

   (a) **Exposure** (b) **Gamma**
   (c) Display settings (d) Both (a) and (b)

3. The _____ button is used to snap the selected object to the center of the other object.

4. The _____ area helps you select an object by entering its name in the **Name Selection** area.

5. The **Show/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 functions 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 combination of shortcut keys is used to toggle between **Attribute Editor** and **Channel Box/Layer Editor** ?

   (a) SHIFT+M (b)CTRL+ SHIFT+M
   (c) SHIFT+N (d) CTRL+A

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

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