

# Chapter 3

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## Surface and Curve Modeling

### Learning Objectives

**After completing this chapter, you will be able to:**

- *Work with surface primitives*
- *Use the curve tools for creating different models*
- *Use the Rotoscopic technique*
- *Modify the surface geometry*

## INTRODUCTION

Surface is one of the basic types of renderable geometry which can be used to create smooth, precise, and seamless models. Surfaces are NURBS (Non-uniform rational B-Spline) patches that can be mathematically represented as 3D models. The surface objects have less subdivisions than polygon objects and they are ideal for creating objects such as car, bike, aeroplane, and so on. Surface objects have many components such as points, knots, knot curves, NURBS boundaries, isolines, surface curves, trim curves, samples, and subsurfaces. There are seven types of surface primitives available in Softimage: Cone, Cube, Cylinder, Disc, Grid, Sphere, and Torus.

The NURBS patches are the interconnected patchwork of smaller surfaces defined by intersecting NURBS curves. NURBS curves are linear (degree 1) or cubic (degree 3) and help you to create complex meshes and surfaces easily. In this chapter, you will create models using various curve and surface modeling techniques.

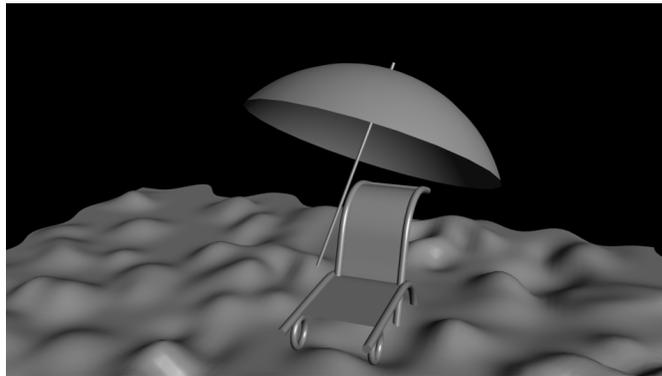
## TUTORIALS

Before you start the tutorials, you need to download the *c03\_softimage\_2014\_tut.zip* file from [www.cadcim.com](http://www.cadcim.com). The path of this file is as follows: *Textbooks > Animation and Visual Effects > Softimage > Autodesk Softimage 2014: A Tutorial Approach*

Next, extract the contents of the zip file to *Documents*.

### Tutorial 1

In this tutorial, you will create a sea beach scene using the surface primitives, as shown in Figure 3-1. **(Expected time: 40 min)**



*Figure 3-1 The sea beach scene*

The following steps are required to complete this tutorial:

- a. Create the project folder.
- b. Create the beach surface.
- c. Create the beach umbrella.

- d. Create the seat supports of the chair.
- e. Create the seat of the chair.
- f. Create the back supports of the chair.
- g. Create the elliptical legs of the chair.
- h. Save and render the scene.

### Creating the Project Folder

Create a new project folder with the name *c03\_tut1* at *\Documents\softimage2014* and then save the file with the name **c03\_tut\_01**, as discussed in Tutorial 1 of Chapter 2.

### Creating the Beach Surface

In this section, you will create the beach surface.

1. Choose **Model > Get > Primitive > Surface > Grid** from the main toolbar; the **Scene\_Root : grid (General)** property editor is displayed. In this property editor, enter **surface** in the **Name** edit box.
2. In the **Grid** property set, enter **30** and **20** in the **U Length** and **V Length** edit boxes, respectively.
3. In the **Geometry** property set, enter **30** and **20** in the **U** and **V** edit boxes, respectively, of the **Subdivisions** area, respectively. Next, close the property editor; a grid with the name *surface* is created in all viewports.
4. Make sure the Camera viewport is maximized. Press **G** to hide the viewport grid in the Camera viewport. Next, press **T**; the **Point** mode is activated. Now, select the points randomly on *surface* by using the **SHIFT** key and then press **V**; **Translate Tool** is activated.
5. Move the points along the **Y** axis to create bumps in the surface. Choose the **Display Mode** button from the Viewport menu bar; the **Display Mode** menu is displayed. In this menu, choose **Shaded**; *surface* in the viewport is displayed in shaded mode. Now, press the **+** (plus) key once; *surface* becomes smooth, as shown in Figure 3-2. Now, press **SPACEBAR**; the **Object** mode is activated.
6. Press **F12** to view all the viewports simultaneously. Now, hover the mouse in each viewport and hide the grid by pressing **G**.

### Creating the Beach Umbrella

In this section, you will create the beach umbrella.

1. Choose **Model > Get > Primitive > Surface > Cylinder** from the main toolbar; the **Scene\_Root : cylinder (General)** property editor is displayed. In this property editor, enter **pole** in the **Name** edit box.
2. In the **Cylinder** property set, enter **0.09** and **8** in the **Radius** and **Height** edit boxes, respectively.

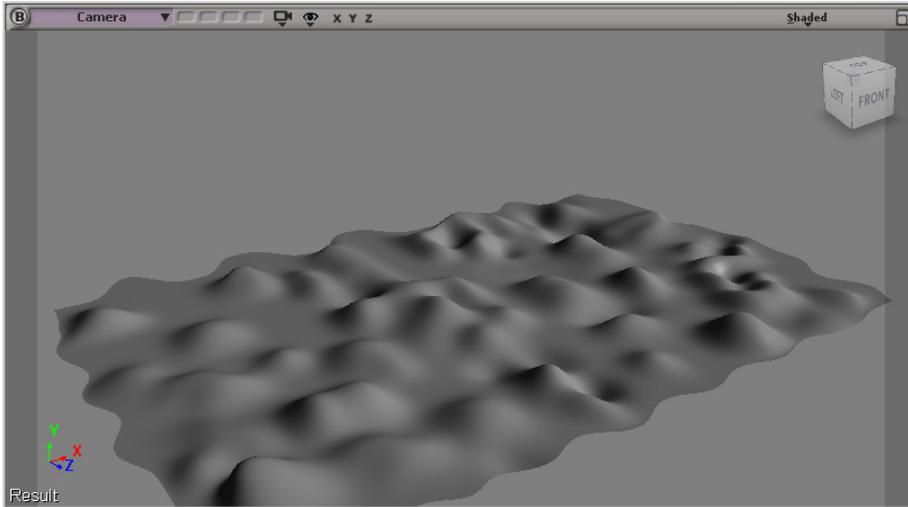


Figure 3-2 The surface displayed in the shaded view

- In the **Geometry** property set, enter **6** in the **V** edit box of the **Subdivisions** area. Next, close the **Scene\_Root : cylinder (General)** property editor; a cylinder with the name *pole* is displayed in viewports.
- Make sure that *pole* is selected in all viewports. Next, set values for the following parameters in the **Transform** subpanel of the Main Command Panel:

<b>s</b> area			
x: <b>0.9</b>	y: <b>1.25</b>	z: <b>0.9</b>	
<b>r</b> area			
x: <b>-29</b>	y: <b>-27</b>		
<b>t</b> area			
x: <b>1.50</b>	y: <b>4.2</b>	z: <b>-3.4</b>	

Next, you will create the canopy of the beach umbrella.

- Choose **Model > Get > Primitive > Surface > Sphere** from the main toolbar; the **Scene\_Root : sphere (General)** property editor is displayed. In this property editor, enter **canopy** in the **Name** edit box.
- In the **Sphere** property set of the property editor, enter **5** in the **Radius** edit box. Next, enter **60** in the **End V** edit box of the **Extent(Angles)** area. Now, close the **Scene\_Root : sphere (General)** property editor; a sphere with the name *canopy* is displayed in viewports.
- Make sure that *canopy* is selected. Next, set values for the following parameters in the **Transform** subpanel of the Main Command Panel:

s area

x: 1.4                      y: 1.4                      z: 1.4

r area

x: -28                      y: -22                      z: 0.4

t area

x: 1.2                      y: 2.08                      z: -2.22

After entering the values, *canopy* is aligned at the top of *pole* in viewports, as shown in Figure 3-3.

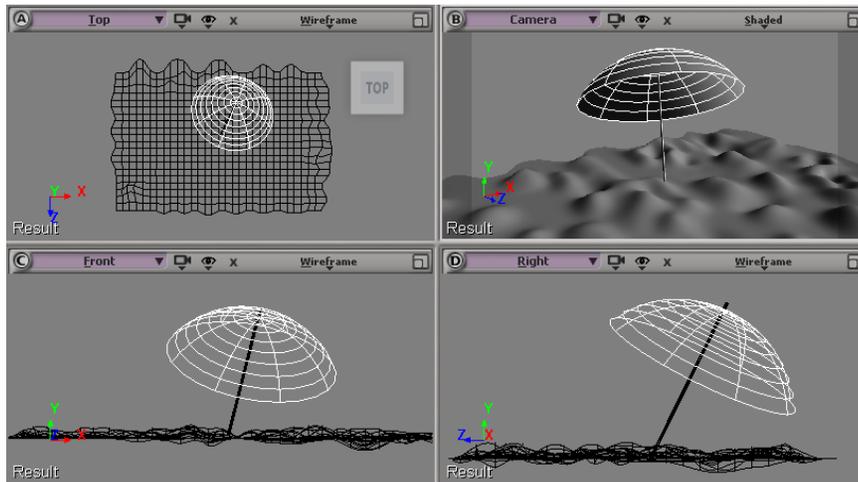


Figure 3-3 The canopy aligned at the top of the pole in viewports

### Creating the Seat Supports of the Chair

In this section, you will create the seat supports of the chair by using the surface geometry.

1. Choose **Model > Get > Primitive > Surface > Cylinder** from the main toolbar; the **Scene\_Root : cylinder (General)** property editor is displayed. In this property editor, enter **seatsupport1** in the **Name** edit box.
2. In the **Cylinder** property set, enter **0.15** and **8** in the **Radius** and **Height** edit boxes, respectively.
3. In the **Geometry** property set, enter **10** and **8** in the **U** and **V** edit boxes, respectively, of the **Subdivisions** area. Next, close the **Scene\_Root : cylinder (General)** property editor; a cylinder with the name *seatsupport1* is displayed in viewports.

Next, you will bend *seatsupport1*.



- Enter **5.1** in the **x** edit box of the **t** area in the **Transform** subpanel of the Main Command Panel; *seatsupport2* is aligned with *seatsupport1*, as shown in Figure 3-6.

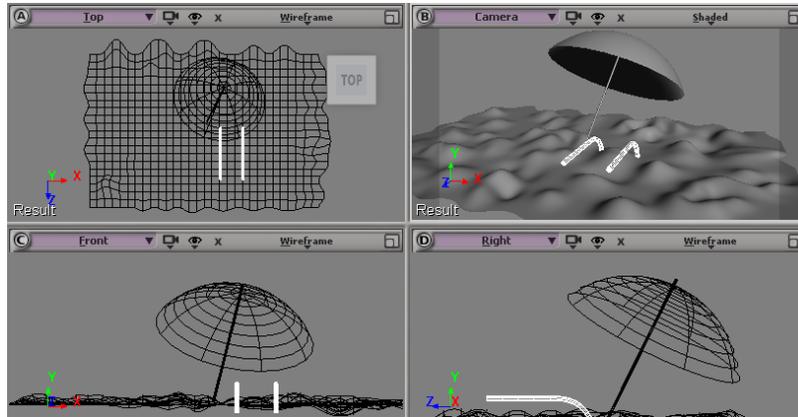


Figure 3-6 Alignment of *seatsupport1* and *seatsupport2*

## Creating the Seat of the Chair

In this section, you will create the seat of the chair by using the surface geometry.

- Choose **Model > Get > Primitive > Surface > Grid** from the main toolbar; the **Scene\_Root : grid (General)** property editor is displayed. In this property editor, enter **seat** in the **Name** edit box.
- In the **Geometry** property set, enter **10** in the **U** and **V** edit boxes of the **Subdivisions** area. Next, close the property editor; a grid with the name *seat* is displayed in viewports.
- Set the values for the following parameters in the **Transform** subpanel of the Main Command Panel:

**s** area

x: **0.45**                      y: **0.03**                      z: **0.5**

**r** area

x: **-1.5**    z: **0.04**

**t** area

x: **3.6**    y: **1.6**    z: **2.6**

After entering the values, *seat* is placed over the seat supports.

Next, you will modify the shape of *seat* to fit it on the seat supports.

- Press **T**; the **Point** mode is activated. Next, marquee select the points from the Right viewport, refer to Figure 3-7.

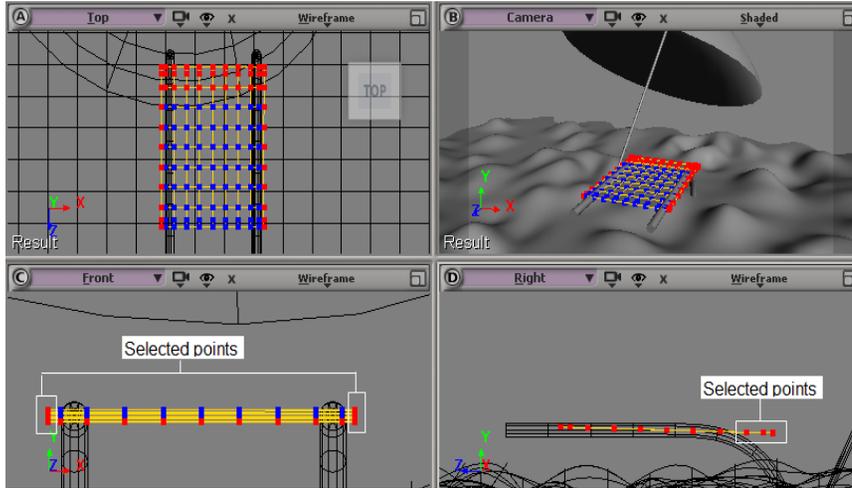


Figure 3-7 Points selected in viewports

- Press the V key; **Translate Tool** is activated. Now, move the selected points along the curve of the seat supports to define the shape of the seat. Again press the V key; **Translate Tool** gets deactivated. Next, marquee select the points from the Front viewport, refer to Figure 3-7 and then activate **Translate Tool** to align the points to get the shape of the seat, refer to Figure 3-8.

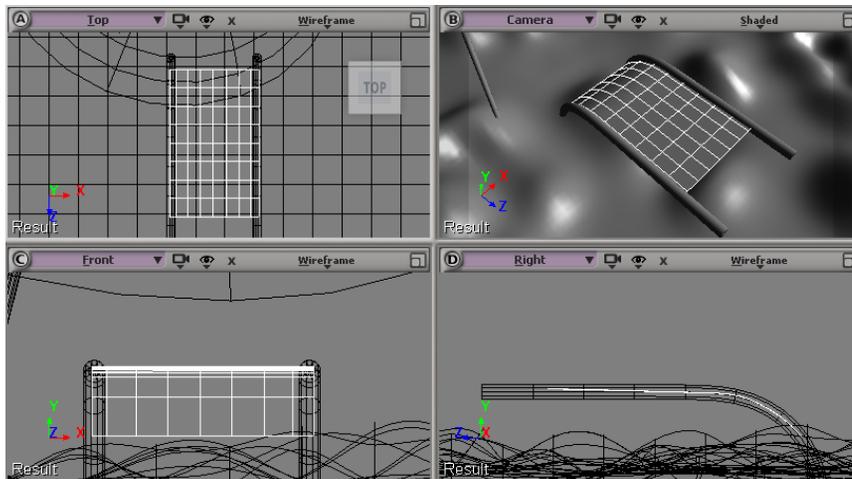


Figure 3-8 The modified shape of the seat

### Creating the Back Supports of the Chair

In this section, you will create the back support of the chair.

- Choose **Model > Get > Primitive > Surface > Cylinder** from the main toolbar; the **Scene\_Root : cylinder (General)** property editor is displayed. In this property editor, enter **backsupport1** in the **Name** edit box.





After entering the values, *backsupport3* is placed between *backsupport1* and *backsupport2*, as shown in Figure 3-11.

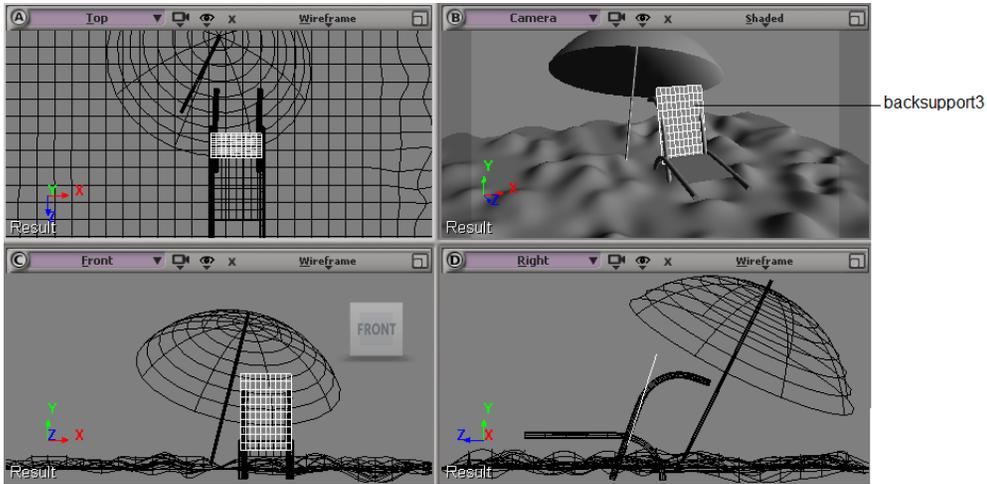


Figure 3-11 The *backsupport3* placed between *backsupport1* and *backsupport2*

- Next, press T; the **Point** mode is activated. Next, adjust the points of *backsupport3* on *backsupport1* and *backsupport2* to get the shape, as discussed earlier.

Figure 3-12 shows the modified shape of *backsupport3*.

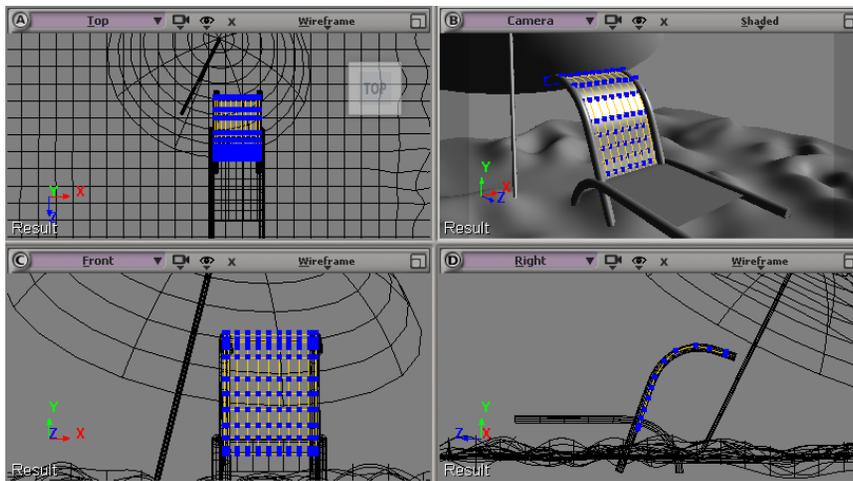


Figure 3-12 The shape of *backsupport3* changed

### Creating the Elliptical Legs of the Chair

In this section, you will create the elliptical legs of the chair.

- Choose **Model > Get > Primitive > Surface > Torus** from the main toolbar; the **Scene\_Root : torus (General)** property editor is displayed. In this property editor, enter **wheel1** in the Name edit box.

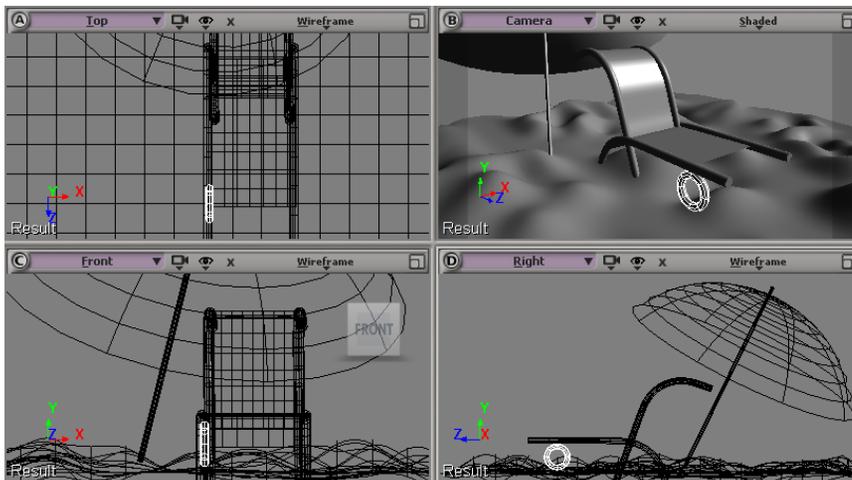
- In the **Torus** property set, enter **1.03** and **0.25** in the **Main** and **Cross Section** edit boxes, respectively, of the **Radius** area. Next, close the property editor; a torus with the name *wheel1* is created in all the viewports.
- Set the values for the following parameters in the **Transform** subpanel of the Main Command Panel:

**s** area  
 x: **0.5**                      y: **0.5**                      z : **0.5**

**r** area  
 z: **90**

**t** area  
 x: **2.22**                      y: **0.9**                      z: **5**

After entering the values, *wheel1* is placed in viewports, as shown in Figure 3-13.



*Figure 3-13* Placing *wheel1* in viewports

- Make sure *wheel1* is selected in the viewport and then press CTRL+D; a duplicate of *wheel1* is created with the name *wheel2*. Enter **5** in the **x** edit box in the **t** area of the **Transform** subpanel of the Main Command Panel; *wheel2* is aligned with *seatsupport2*, refer to Figure 3-14

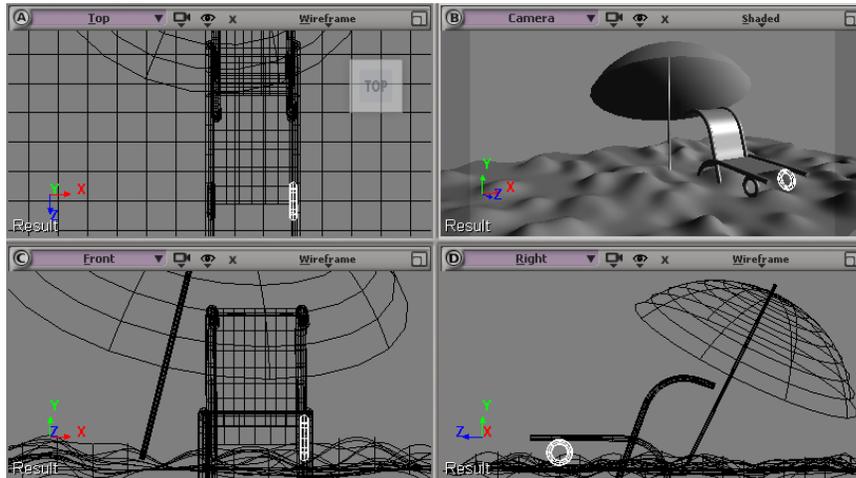


Figure 3-14 Aligning wheel2 with seat support2 in viewports

### Saving and Rendering the Scene

In this section, you will save the scene that you have created and then render it. You can view the final rendered image of this scene by downloading the *c03\_softimage\_2014\_rndr.zip* file from [www.cadcam.com](http://www.cadcam.com). The path of this file is as follows: *Textbooks > Animation and Visual Effects > Softimage > Autodesk Softimage 2014: A Tutorial Approach*

1. Choose **File > Save** from the menu bar.
2. Activate the Camera viewport and then set the camera angle in it as required.
3. Choose **Render > Render > Regions** from the menu bar; a cascading menu is displayed. Next, choose **Region Tool** from the cascading menu; the tool is activated and the shape of the cursor changes.
4. Draw a rectangular region around the area you want to render; the area enclosed within the rectangular region is rendered, refer to Figure 3-15.

You can also activate **Region Tool** by pressing **Q**. To increase the quality of the render, drag the quality slider up, located at the right of the region window, refer to Figure 3-15. When you click on the black triangle located at the top left corner of the render region window, a flyout is displayed, refer to Figure 3-16. You can use this flyout to refresh or hide the window. It can also be used to select the channels to be viewed in this window.

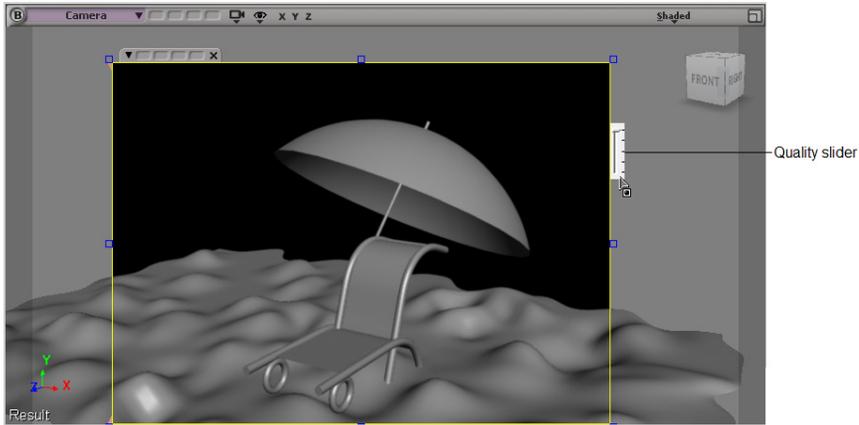


Figure 3-15 The render region window and the quality slider

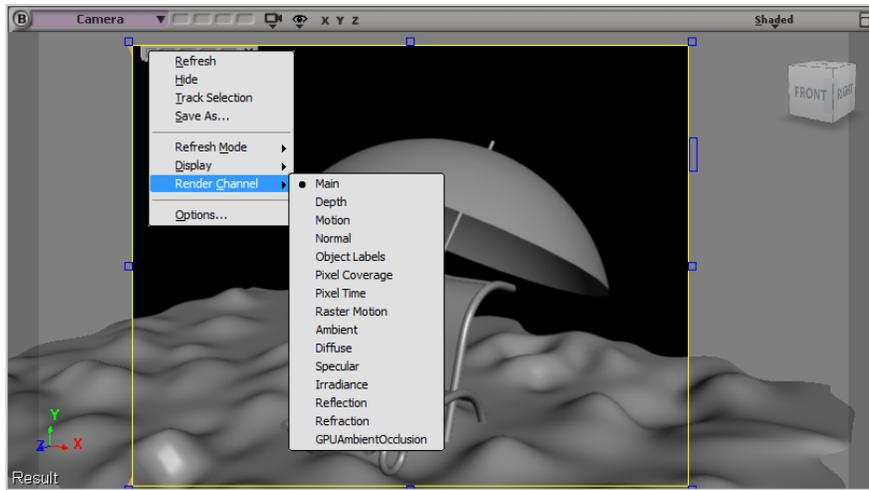
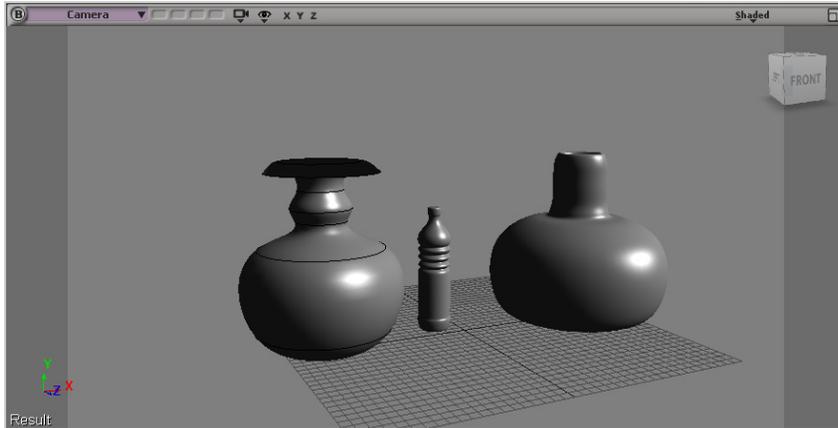


Figure 3-16 The flyout displayed on clicking the black triangle

## Tutorial 2

In this tutorial, you will create a pot, a bottle, and a vase. You will use curve tools to create the pot, the rotoscopy method to create the bottle, and the loft method to create the vase, as shown in Figure 3-17.

**(Expected time: 30 min)**



*Figure 3-17 The models of pot, bottle, and vase*

The following steps are required to complete this tutorial:

- a. Create the project folder.
- b. Create a pot.
- c. Create a bottle.
- d. Create a vase.
- e. Save and render the scene.

### Creating the Project Folder

Create a new project folder with the name `c03_tut2` at `\Documents\softimage2014` and then save the file with the name `c03_tut_02`, as discussed in Tutorial 1 of Chapter 2.

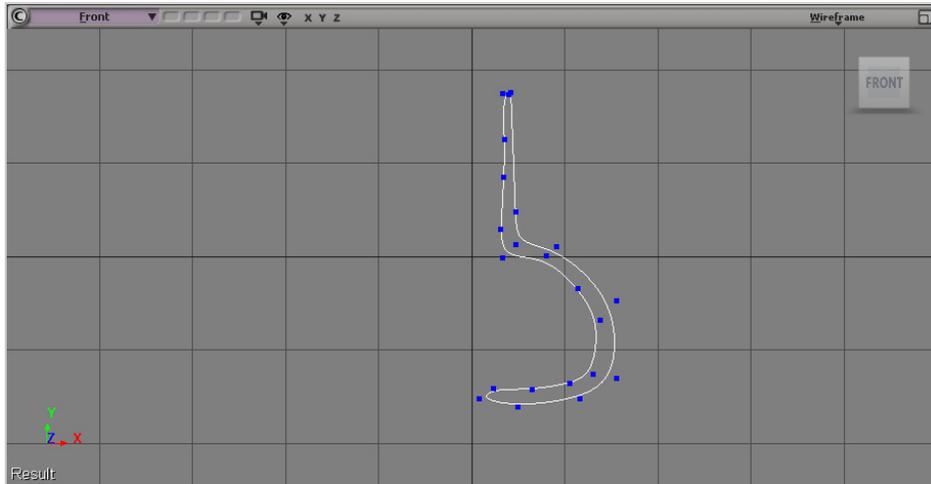
### Creating a Pot

In this section, you will create a pot model by using curves.

1. Choose **Model > Create > Curve** from the main toolbar; a flyout is displayed. Next, choose **Draw Cubic by CVs** from the flyout; the shape of the cursor changes to a pen shape.
2. Choose the Views menu from the viewport menu bar; a flyout is displayed. Choose **Front** from the flyout; the Front viewport is maximized. Next, click at different places in the Front viewport to create a curve, as shown in Figure 3-18. Right-click on the curve; a shortcut menu is displayed. Choose **Open/Close** from the menu; the ends of the curve are closed. Now, press ESC to exit the **Draw Cubic by CVs** tool. Alternatively, right-click on the curve; a shortcut menu is displayed. Next, choose **Exit Tool** from the shortcut menu.



**Tip:** If you want to tweak the shape of the curve, choose **Model > Modify > Curve > Tweak Curve** from the main toolbar or press *M*; the shape of cursor changes. You can then adjust the points on the curve.



*Figure 3-18 Shape of the curve created in the Front viewport*

Next, you will apply the **Revolution Around Axis** tool to the curve to create the pot model.

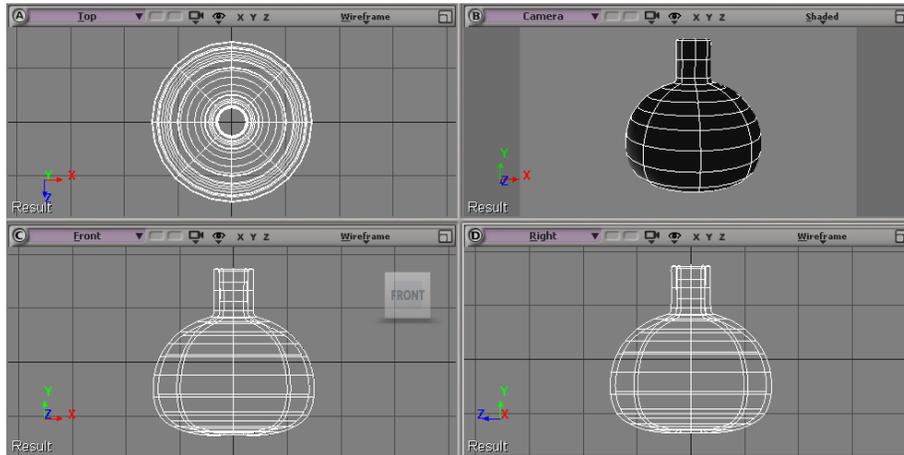
3. Press F12 to view all the viewports simultaneously. Next, choose **Model > Create > Surf. Mesh > Revolution Around Axis** from the main toolbar; the **Scene\_Root : surfmsh : NURB Surface Mesh : Revolution** property editor is displayed. In this property editor, enter **2** in both the **U** and **V** edit boxes, respectively, of the **Subdivisions** area; the surface mesh is created. Next, close the property editor.

The revolved shape created using the **Revolution Around Axis** tool depends on the axis of revolution specified in the **Revolution Axis** area of the **Scene\_Root : surfmsh : NURB Surface Mesh : Revolution** property editor. By default, the **Revolve Around Y** check box is selected in this area. As a result, the curve is revolved around the Y axis and you get the shape shown in Figure 3-19. You can create different shapes by using the **Revolve Around X** and **Revolve Around Z** check boxes from the **Revolution Axis** area.

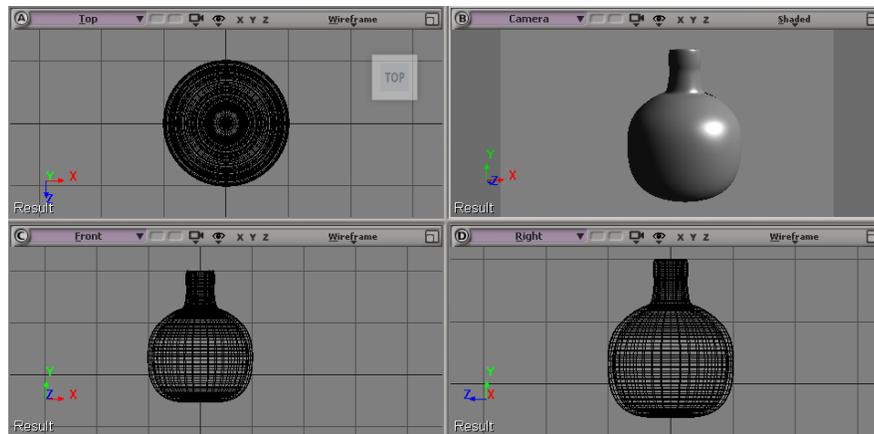
4. Choose the Display Mode button from the Viewport menu bar; the Display Mode menu is displayed. Next, choose **Shaded** from the menu; the geometry in the viewports is displayed shaded. Figure 3-19 displays the shape of the pot in all viewports.

You will notice that the color of the pot is displayed as black instead of default grey. Next, you will rectify this.

5. Choose **Model > Modify > Surf. Mesh** from the main toolbar; a flyout is displayed. Next, choose **Invert Normals** from the flyout; the color of the pot is now changed to default grey, refer to Figure 3-20 and the **Scene\_Root : surfmsh : NURBS\_Surface Mesh** window is displayed. Now, close the window.



*Figure 3-19 The shape of the pot displayed in viewports*



*Figure 3-20 The color of the pot changed using the **Invert Normals** option*

6. Choose **Scene** button from the **Select** subpanel of the Main Command Panel; the **Explorer** window is displayed. Next, choose **crvlist** from the window and then press H; the curve is hidden in the viewports. Now, select the pot and move it to a different location so that you can create another objects.

## Creating a Bottle

In this section, you will create a model of a bottle using the rotoscopy method.

1. Open Windows Explorer and then browse to `|Documents|c03_softimage_2014_tut`. Next, copy the `glass-water-bottle-1.jpg` to `|Documents|softimage2014|c03_tut2|Pictures`.
2. Activate the Front viewport and press F12; the Front viewport is maximized. Choose the Display Mode button from the Viewport menu bar; the Display Mode menu is displayed. Next, choose **Rotoscopy Options** from the menu; the **FrontCamera : Camera Rotoscopy** property editor is displayed.

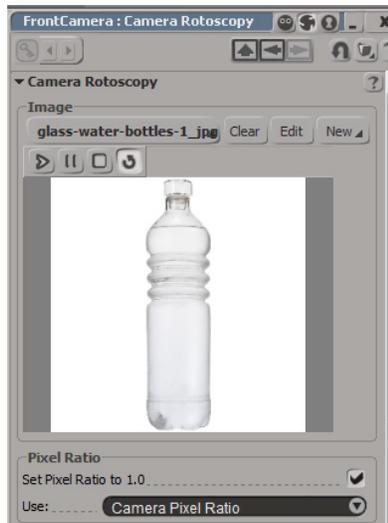
Rotoscopy is a technique in which you can use reference 2D images as viewport background for object modeling. You can also use video or image sequence in the background of a viewport. The Rotoscope images are also referred to as background plates, backplates, or backdrops.

3. Choose the **New** button from the **FrontCamera : Camera Rotoscopy** property editor; a flyout is displayed. Next, choose **New From File** from the flyout; the **New Image Clip** property editor is displayed.
4. In this property editor, select **glass-water-bottles-1.jpg**; the bottle image is displayed in the **FrontCamera : Camera Rotoscopy** property editor, refer to Figure 3-21. In this property editor, set the values of the following parameters and then close the property editor.

Width: 14.29

Height: 15.26

Y: 7.14



*Figure 3-21 The image of the bottle displayed in the **Front Camera : Camera Rotoscopy** property editor*

5. Choose the Display Mode button from the Front Viewport menu bar; a Display Mode menu is displayed. Next, choose **Rotoscope** from the menu; the image of the bottle is displayed in the Front viewport.
6. Choose **Model > Create > Curve > Draw Cubic by CVs** from the main toolbar; the shape of the cursor changes to pen shape. Next, create the outline of bottle in the Front viewport, as shown in Figure 3-22. Press F12 to view all the viewports simultaneously.
7. Choose **Model > Create > Surf. Mesh > Revolution Around Axis** from the main toolbar; the **Scene\_Root : sufmesh : NURB Surface Mesh : Revolution** property editor is displayed. In this property editor, enter **2** in both the **U** and **V** edit boxes in the **Subdivisions** area. Next, close the property editor.

8. Choose **Model > Modify > Surf. Mesh**; a flyout is displayed. Choose **Invert Normals** from the flyout; the color of the bottle is now changed to default grey, refer to Figure 3-23 and the **Scene\_Root : surfmsh : NURBS\_Surface Mesh** window is displayed. Next, close the window and hide the curve by pressing H as discussed earlier. Now, move this bottle to a different location so that you can create another object.

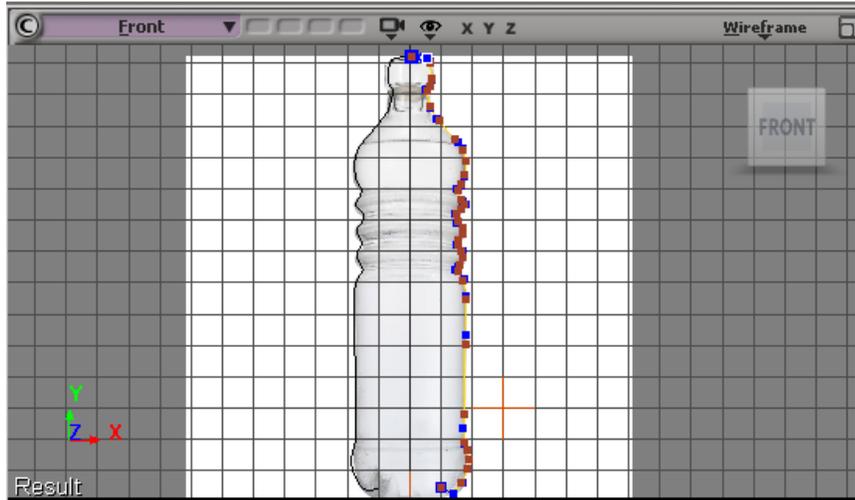


Figure 3-22 The outline of bottle created in the Front viewport

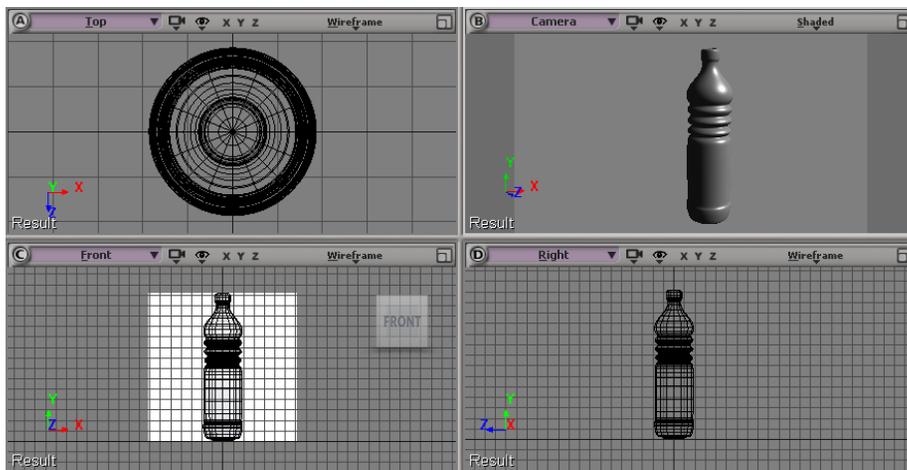


Figure 3-23 The model of bottle displayed in viewports



### Note

By default, rotoposed images are displayed in the orthographic views (Front, Top, and Right). These images are arranged at the center of the grid. Always remember that the first curve point starts from the center of the grid when you use the image reference. To toggle the display of rotopose, choose the Display Mode button from the Viewport menu bar; the Display Mode menu will be displayed. Next, choose **Rotopose** from the menu.

## Creating a Vase

In this section, you will create model of a vase using the loft method.

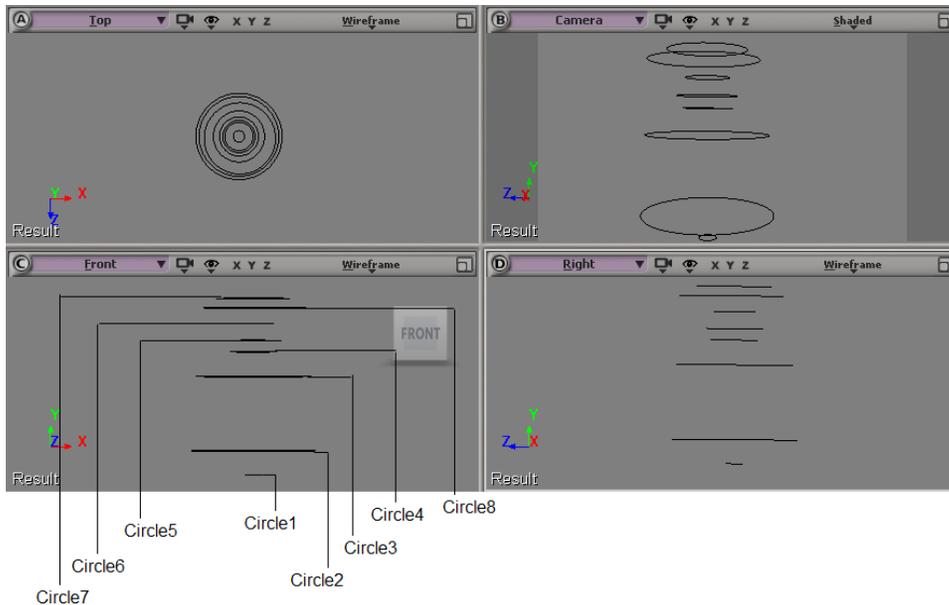
1. Choose **Model > Primitive > Curve > Circle** from the main toolbar; a circle is created in all viewports and the **Scene\_Root : circle (General)** property editor is displayed. Now, close the property editor.
2. Set the values for the following parameters in the **Transform** subpanel of the Main Command Panel:

r area

y: **90**

z: **90**

3. Duplicate the circle and make seven more copies of the circle. Next, uniformly scale the circles and align them, as shown in Figure 3-24.



*Figure 3-24* Circles transformed and scaled in viewports

4. In the Camera viewport, select *circle1* to *circle7* by using the SHIFT key and then choose **Model > Create > Surf. Mesh > Loft** from the main toolbar; the **Scene Root : surfmsh# : NURBS Surface Mesh : Loft** property editor is displayed. In this property editor, enter **3** in both the **U** and **V** edit boxes in the **Subdivisions** area. Next, close the property editor; the vase is displayed in viewports.
5. Choose **Model > Modify > Surf. Mesh** from the main toolbar; a flyout is displayed. Next, choose **Invert Normals** from the flyout; the color of the pot changes to default grey. Figure 3-25 displays the lofted 3D model of the vase in viewports.

The **Loft** tool is used to create a geometry by using a series of profile curves. At least two profile curves are required to create a surface. If the input curves are closed, the resulting geometry will be closed and vice versa.

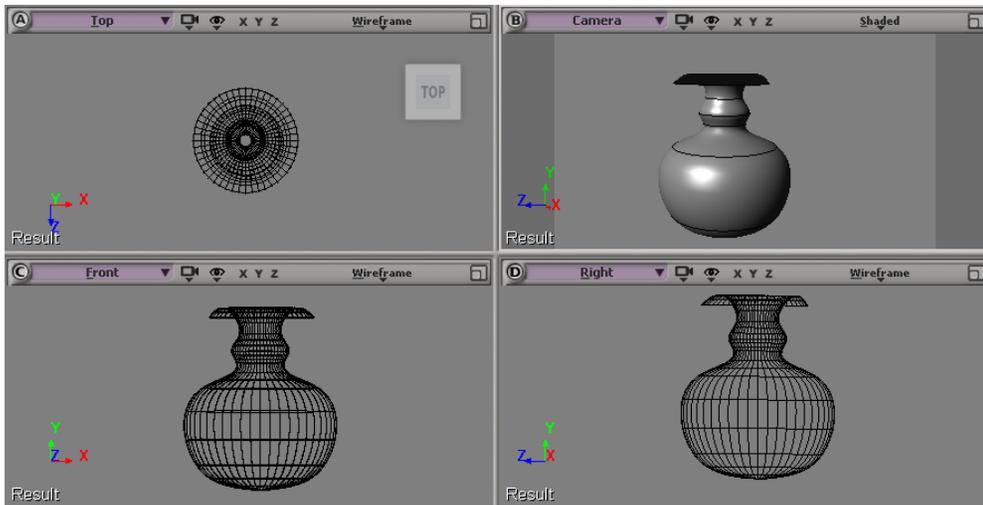


Figure 3-25 The lofted 3d model of vase displayed in viewports

### Saving and Rendering the Scene

In this section, you will save the scene that you have created and then render it. You can view the final rendered image of this scene by downloading the *c03\_softimage\_2014\_rndr.zip* file from [www.cadcim.com](http://www.cadcim.com). The path of this file is as follows: *Textbooks > Animation and Visual Effects > Softimage > Autodesk Softimage 2014: A Tutorial Approach*

1. Choose **File > Save** from the menu bar.
2. Activate the Camera viewport and then set the camera angle in it as required. Choose **Render > Render > Preview** from the menu bar; a window is displayed with the rendered output.

## Tutorial 3

In this tutorial, you will create a 3D model of a hat using surface mesh, as shown in Figure 3-26. **(Expected time: 30 min)**

The following steps are required to complete this tutorial:

- a. Create the project folder.
- b. Create the basic shape of the hat.
- c. Modify the shape of the hat.
- d. Create the rings around the hat.
- e. Save and render the scene.

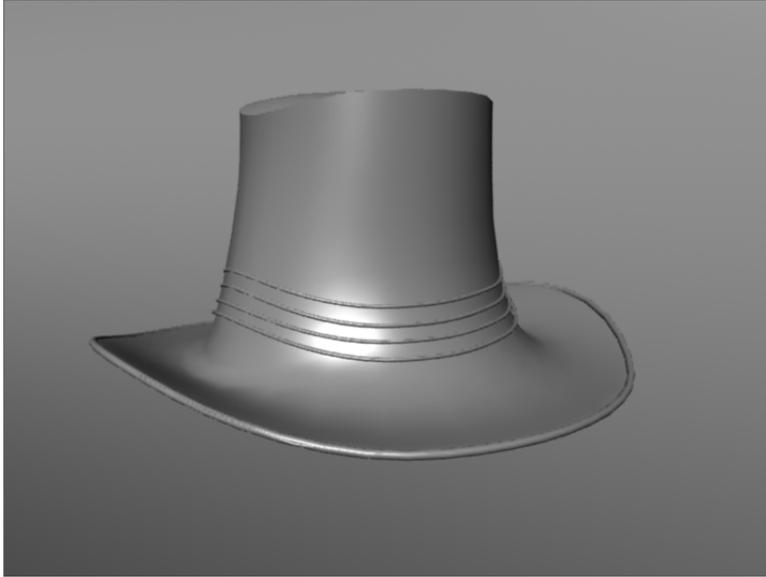


Figure 3-26 The model of hat

### Creating the Project Folder

Create a new project folder with the name *c03\_tut3* at *\Documents\softimage2014* and then save the file with the name **c03\_tut\_03**, as discussed in Tutorial 1 of Chapter 2.

### Creating the Basic Shape of the Hat

In this section, you will create the basic shape of the hat using surface mesh.

1. Choose **Model > Get > Primitive > Surface > Cylinder** from the main toolbar; the **Scene\_Root : cylinder (General)** property editor is displayed. In this property editor, enter **hat** in the **Name** edit box.
2. In the **Cylinder** property set, enter **3.18** in the **Radius** edit box.
3. In the **Geometry** property set, enter **5** in the **V** edit box of the **Subdivisions** area. Next, close the property editor; a cylinder with the name *hat* is displayed in Camera viewport.
4. Choose the Display Mode button from the Camera Viewport menu bar; the Display Mode menu is displayed. Next, choose **Shaded** from the menu; *hat* is displayed in the shaded mode in the Camera viewport. To view all the viewports simultaneously, press F12.
5. Activate the Front viewport and then Press F12; the Front viewport is maximized. Next, press T; the **Point** mode is activated. Select the points in the Front viewport, as shown in Figure 3-27.
6. Press F12 to view all the viewports simultaneously. Press X; **Scale Tool** is activated. In the Camera viewport, scale the points uniformly in all directions, refer to Figure 3-28.

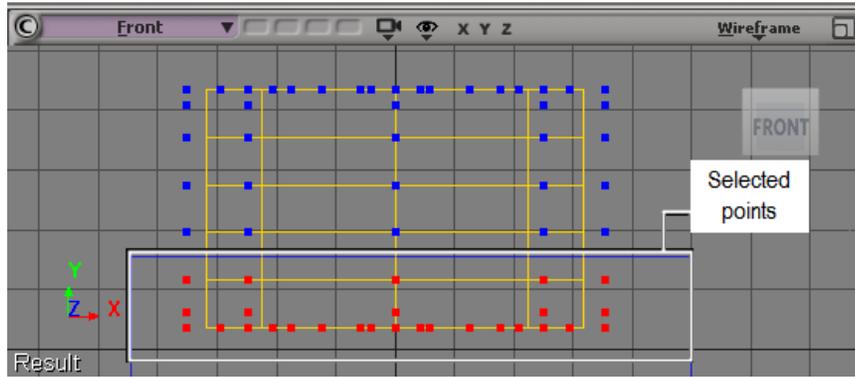


Figure 3-27 Points selected in the Front viewport

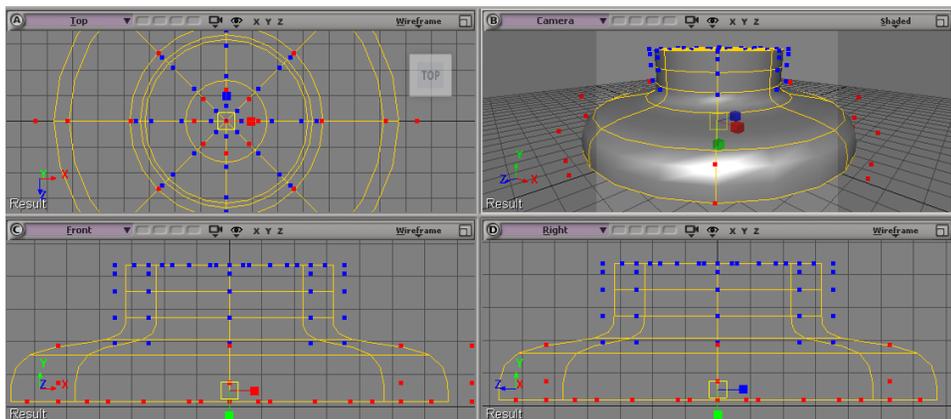


Figure 3-28 The points scaled uniformly

7. Make sure the points are selected, refer to Figure 3-28. Select the green handle of **Scale Tool** and scale the selected points along the Y axis; the mesh gets modified, as shown in Figure 3-29. Again press X; **Scale Tool** is deactivated.

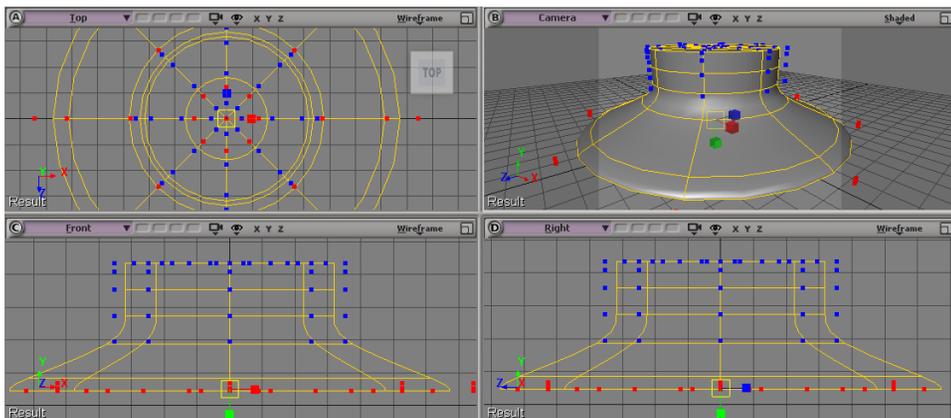
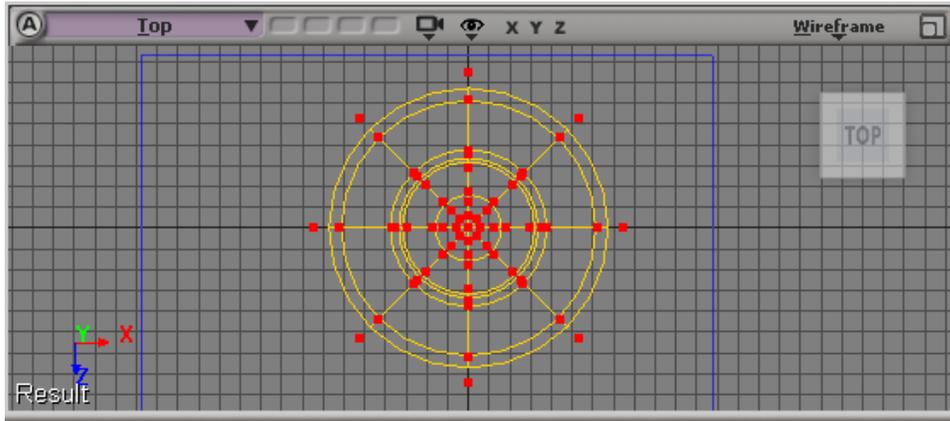


Figure 3-29 Selected points scaled along the Y axis

## Modifying the Shape of the Hat

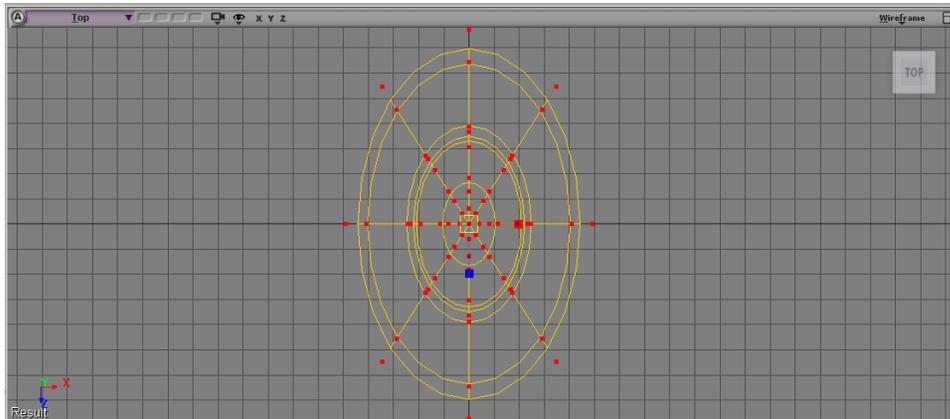
In this section, you will modify the shape of *hat*.

1. Activate the Top viewport and press F12; the Top viewport is maximized. Make sure the **Point** mode is activated. Select all points in the Top viewport, as shown in Figure 3-30.



*Figure 3-30 Points selected in the Top viewport*

2. Press X; **Scale Tool** is activated. Scale the selected points along the Z axis, as shown in Figure 3-31. Next, press X; **Scale Tool** is deactivated.



*Figure 3-31 Selected points scaled along the Z axis*

3. Press F12 again to view all the viewports. In the Right viewport, select the points using SHIFT, refer to Figure 3-32. Next, press V; **Translate Tool** is activated. Now, move the selected points slightly upward along the Y axis, refer to Figure 3-32. Press V; **Translate Tool** is deactivated.
4. In the Front viewport, select the points, refer to Figure 3-33, and then press V; **Translate Tool** is activated. Now, move the points (the points to be selected are encircled for reference) up along the Y axis, refer to Figure 3-33. Press V again; **Translate Tool** is deactivated.

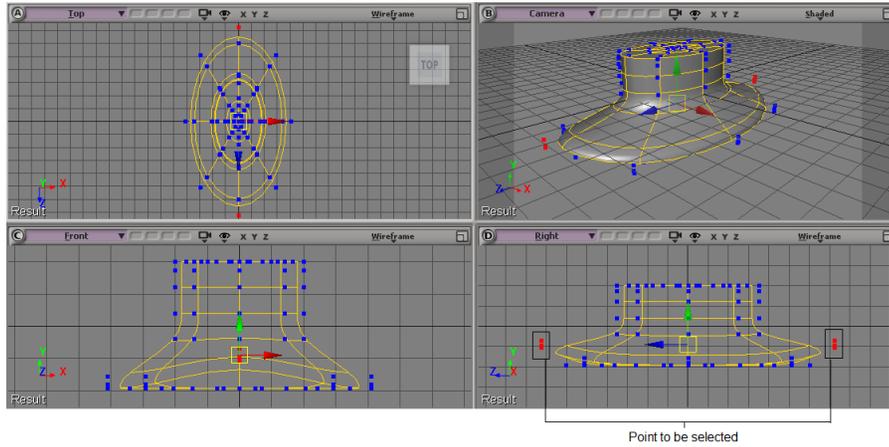


Figure 3-32 Moving the selected points along the Y axis

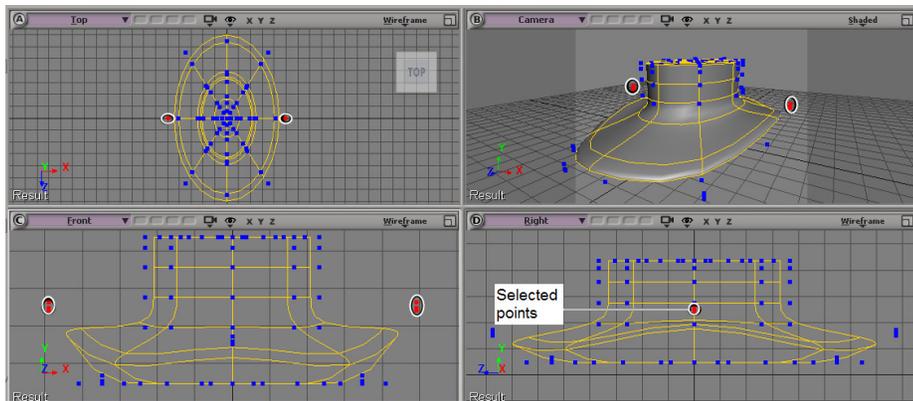


Figure 3-33 The selected points moved up along the Y axis

5. In the Front viewport, select the points, as shown in Figure 3-34. Press V; **Translate Tool** is activated. Now, move the selected points up along the Y axis, as shown in Figure 3-35. Press V; **Translate Tool** is deactivated.

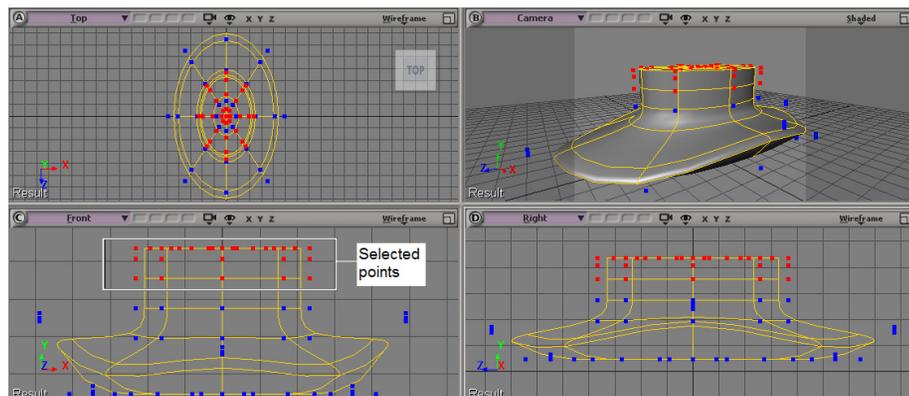


Figure 3-34 Points selected in the Front viewport

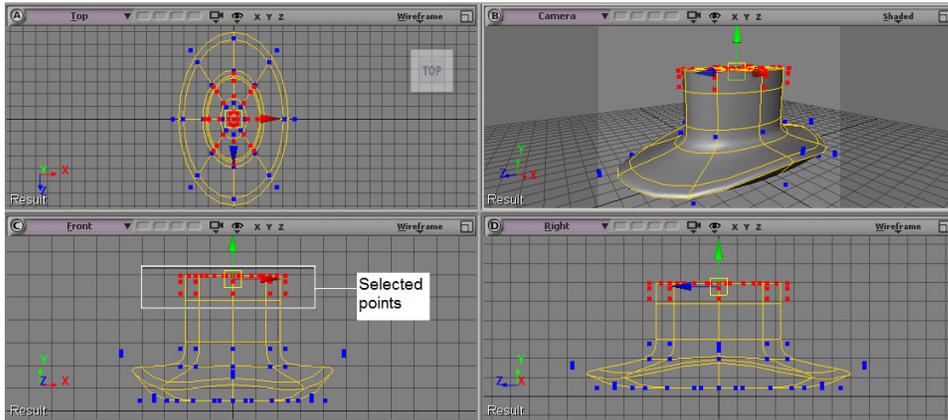


Figure 3-35 Moving the points up along the Y direction

- In the Right viewport, select the points, as shown in Figure 3-36. Next, press V; **Translate Tool** is activated. Move the selected points down along the Y axis, as shown in Figure 3-37. Now, press V; **Translate Tool** is deactivated.

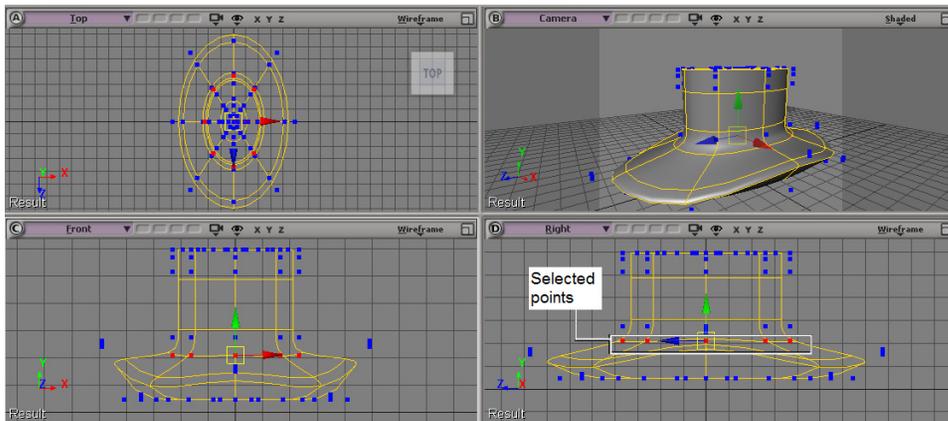


Figure 3-36 Points selected in the Right viewport

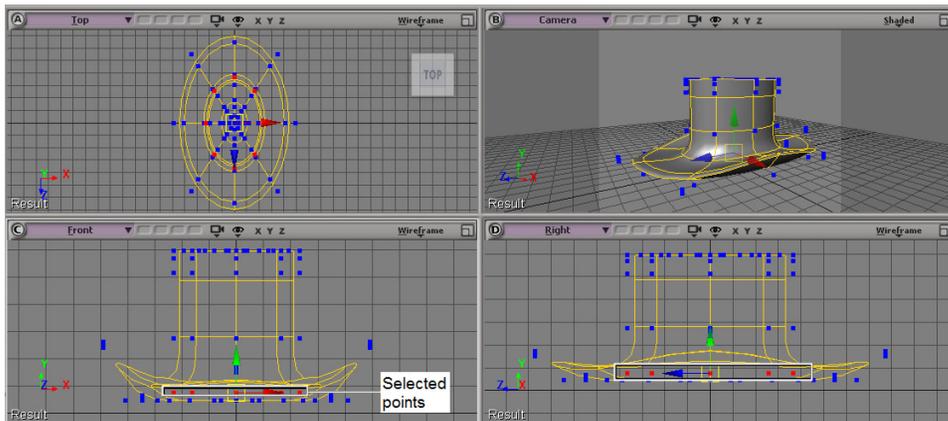


Figure 3-37 Moving the points down along the Y direction

7. Select the points in the Top and Right viewports, as shown in Figure 3-38. Next, press V; **Translate Tool** is activated. Move the selected points down along the Y axis, as shown in Figure 3-39. Now, press V; **Translate Tool** is deactivated.

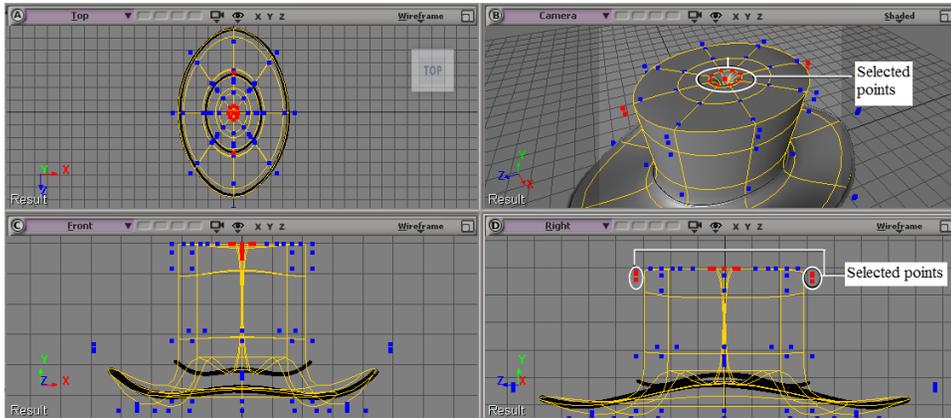


Figure 3-38 Points selected in the Top and Right viewports

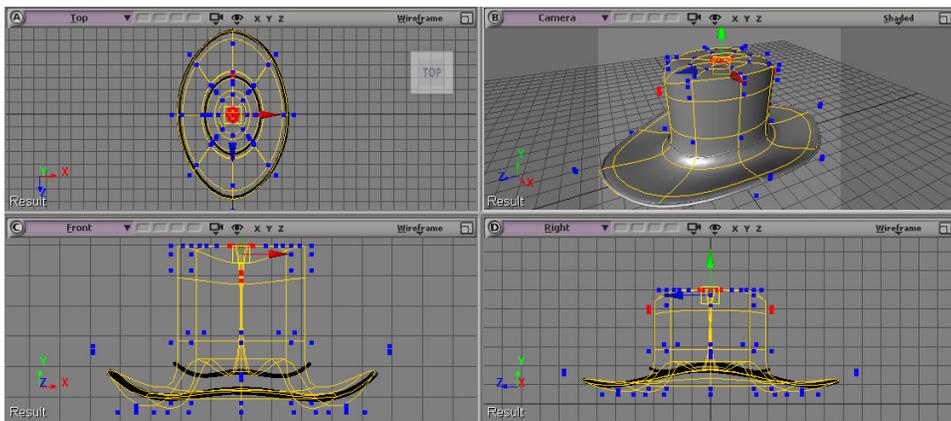


Figure 3-39 Moving the points down along the Y direction

8. Activate the Top viewport and make sure the points are selected. Choose **Model > Modify > Surf. Mesh > Open/Close** from the main toolbar; the **Scene\_Root : hat : NURBS Surface Mesh : Open/Close Surface** property editor is displayed, as shown in Figure 3-40.

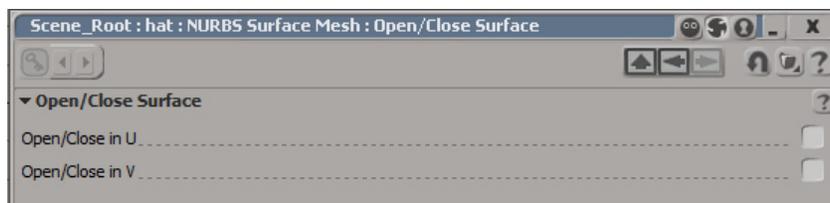
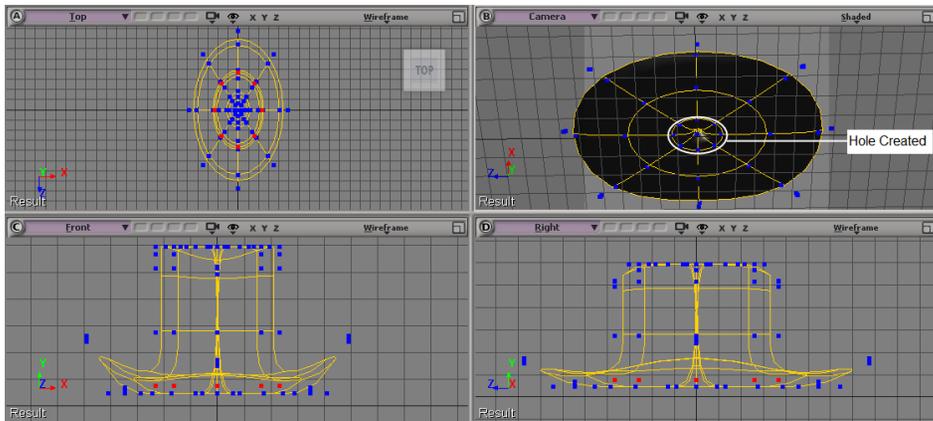


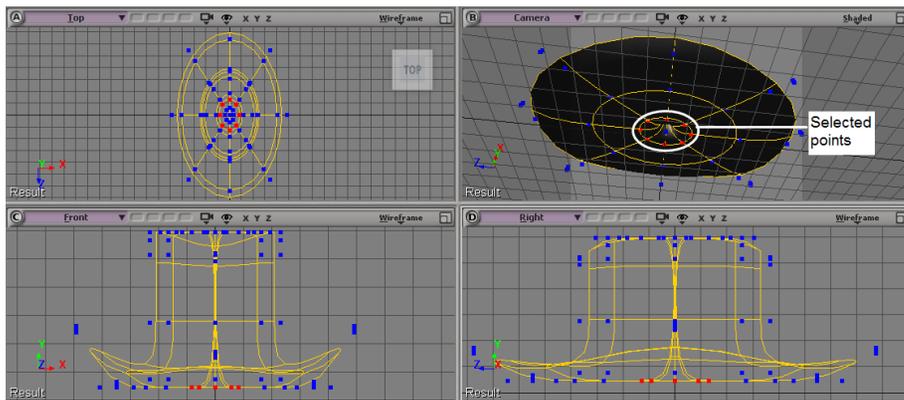
Figure 3-40 The **Scene\_Root : hat : NURBS Surface Mesh : Open/Close Surface** property editor

9. In the **Scene\_Root : hat: NURBS Surface Mesh : Open/Close Surface** property editor, select the **Open/Close in V** check box in the **Open/Close Surface** area; the hole is created in the selected area of *hat*, as shown in Figure 3-41. Next, close the property editor.



*Figure 3-41 The hole created in the selected area of hat*

10. In the Camera viewport select the points (the points to be selected are encircled for reference) of the hat, as shown in Figure 3-42.



*Figure 3-42 Selecting points in the Camera viewport*

11. Press X; **Scale Tool** is activated. Scale the selected points uniformly in the Camera viewport, refer to Figure 3-43.
12. Press V; **Translate Tool** is activated. Next, move the selected points up along the Y axis; the mesh gets modified, as shown in Figure 3-44. Figure 3-45 shows the final shape of the hat model in viewports.

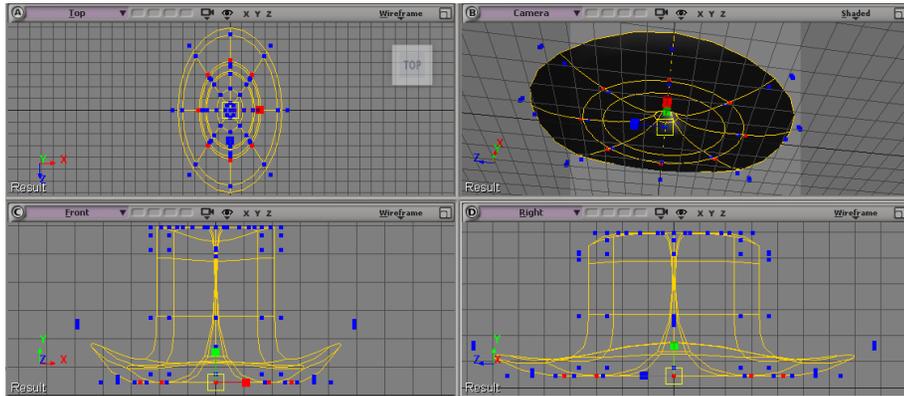


Figure 3-43 The selected points scaled

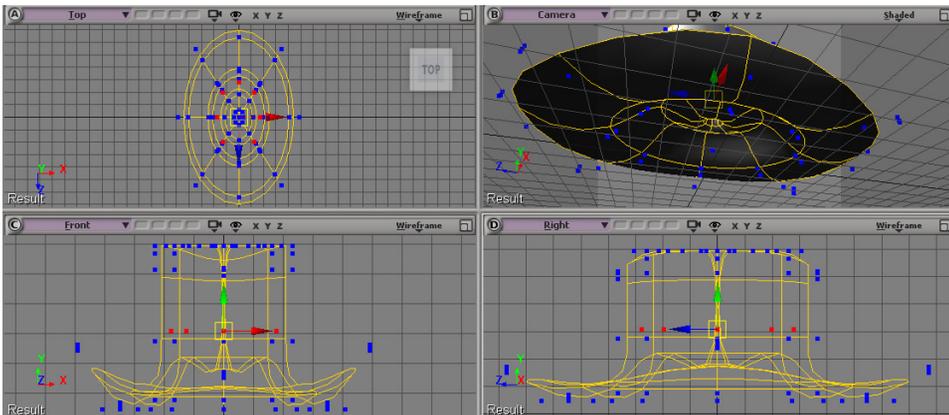


Figure 3-44 Moving the points up along the Y direction

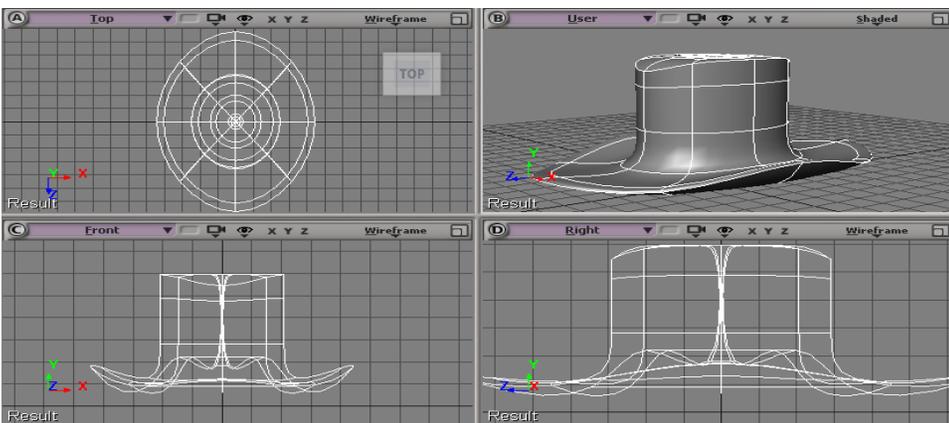


Figure 3-45 The hat model in viewports

## Creating the Rings Around the Hat

In this section, you will create the rings around the hat.

1. Choose **Model > Get > Primitive > Surface > Torus** from the main toolbar; the **Scene\_Root : torus (General)** property editor is displayed. In the **Torus** property set, enter **5.842** and **0.1** in the **Main** and **Cross Section** edit boxes, respectively, of the **Radius** area.
2. In the **Geometry** property set, enter **17** in both the **U** and **V** edit boxes of the **Subdivisions** area. Next, close the property editor; the torus is created in viewports.
3. Press **V**; **Translate Tool** is activated. Next, move the torus along the **Y** axis in the **Front** viewport, as shown in Figure 3-46.

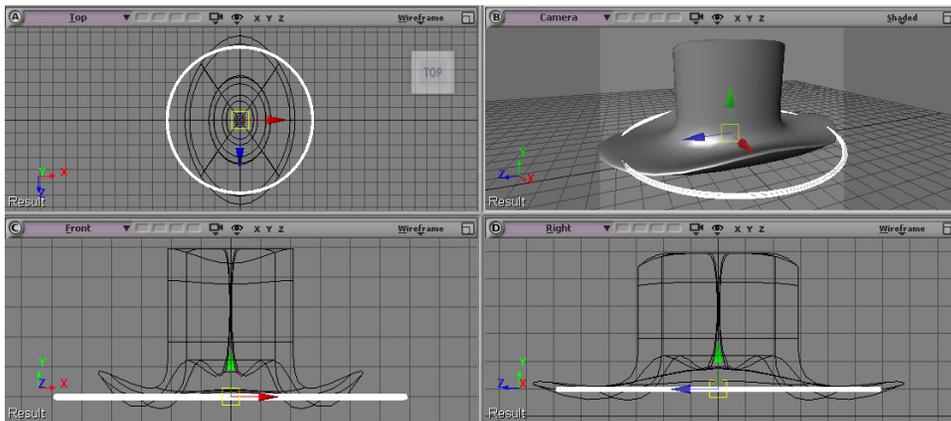


Figure 3-46 Moving the torus up along the Y axis

4. Activate the **Top** viewport. Next, press **T**; the **Point** mode is activated. Select the points of *torus* and scale them in the **Top** viewport using **Scale Tool** to define the shape of *torus* in the **Top** viewport, as shown in Figure 3-47.

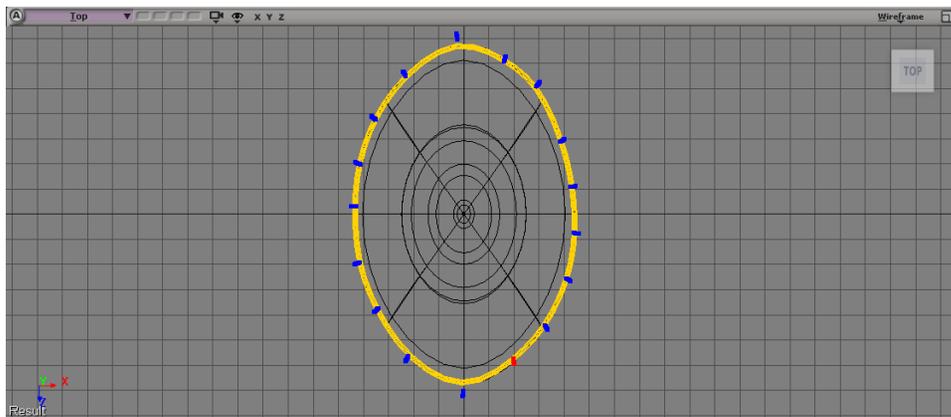


Figure 3-47 The points to be scaled

- Press F12 to view all viewports, simultaneously. Now, set the points in Camera viewport to match it with the shape of the hat; *torus* is modified, as shown in Figure 3-48.

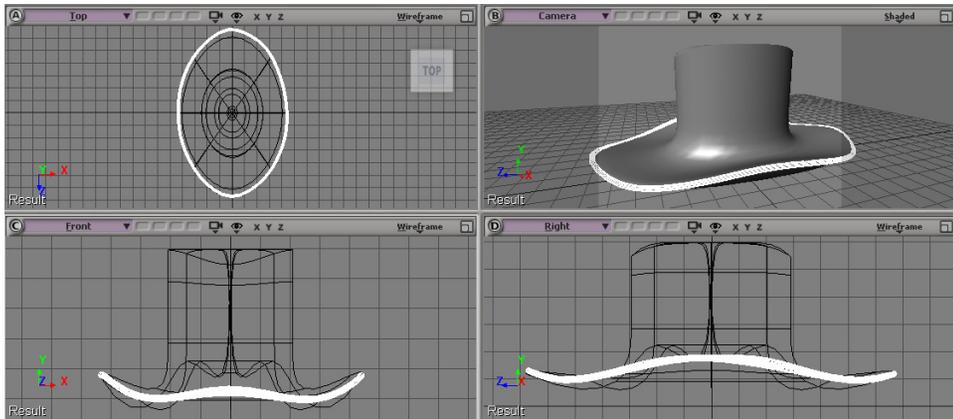


Figure 3-48 Modifying the shape of the torus

- Press SPACEBAR; the **Object** mode is activated. Make sure that *torus* is selected. Next, press CTRL+D; the duplicate copy of *torus* is created with the name *torus1*. Invoke **Translate Tool** and move *torus1* along the Y axis, as shown in Figure 3-49.

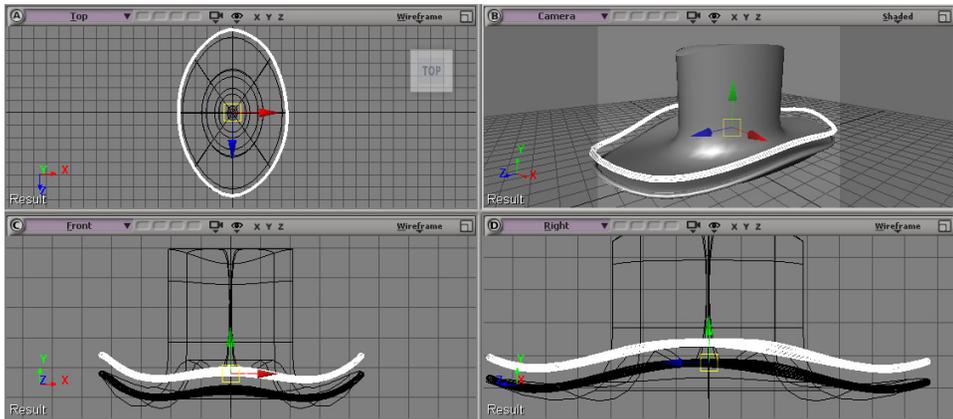


Figure 3-49 Moving the *torus1* along the Y axis

- Press X; **Scale Tool** is activated. Next, scale *torus1* uniformly in the Camera viewport, as shown in Figure 3-50.
- Create two more copies of *torus1* and arrange them, as shown in Figure 3-51.

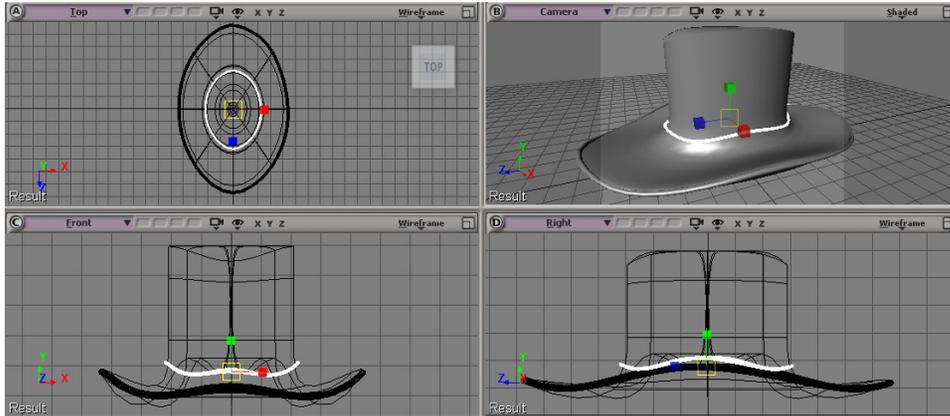


Figure 3-50 Scaling torus1 in the Camera viewport

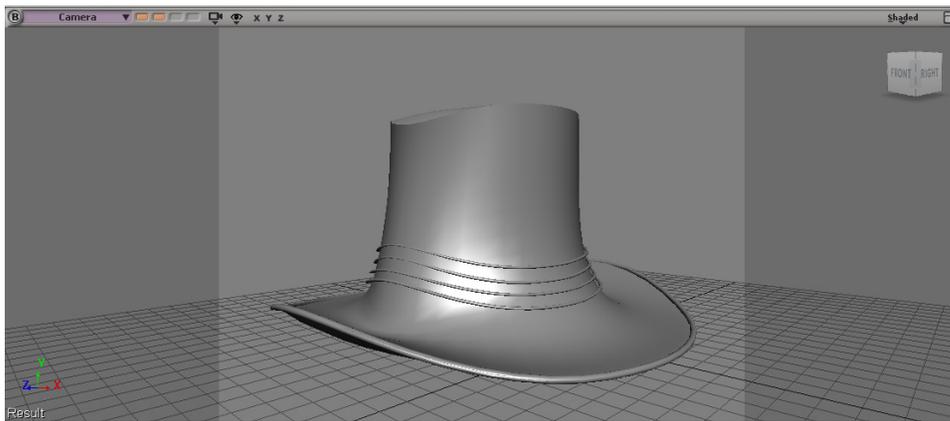


Figure 3-51 The final output

### Saving and Rendering the Scene

In this section, you will save the scene that you have created and then render it. You can view the final rendered image of this scene by downloading the *c03\_softimage\_2014\_rndr.zip* file from [www.cadcim.com](http://www.cadcim.com). The path of this file is as follows: *Textbooks > Animation and Visual Effects > Softimage > Autodesk Softimage 2014: A Tutorial Approach*

1. Choose **File > Save** from the menu bar.
2. Activate the Camera viewport and then set the camera angle in it as required.
3. Choose **Render > Render > Preview** from the menu bar; a window is displayed with the rendered output. Next, close the window.

## Self-Evaluation Test

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

- Which of the following tools is not used to draw 2D shapes for curve modeling?
  - Draw Cubic by CVs
  - Draw Cubic by Bézier-Knot Points
  - Draw Cubic by Knot Points
  - Draw Curve
- Which of the following keys is used to modify the curve points?
  - X
  - V
  - M
  - E
- The \_\_\_\_\_ key is used to maximize the viewport.
- The \_\_\_\_\_ command is used to create a surface or polygon mesh by using a series of profile curves.
- The **Revolution Around Axis** tool is used to convert a curve into a 3D object. (T/F)

## Review Questions

Answer the following questions:

- Which of the following keys is used to exit the curve tool?
  - CTRL
  - SHIFT
  - ESC
  - X
- In \_\_\_\_\_ technique, the reference images are used to create the 3D objects.
- The \_\_\_\_\_ and \_\_\_\_\_ are the two types of curves used in Softimage.
- The \_\_\_\_\_ deformer is used to bend the object in any direction.
- The **Point**, **Polygon**, and **Edge** are the components of curve. (T/F)

## EXERCISES

The rendered output of the models used in the following exercises can be accessed by downloading the *c03\_softimage\_2014\_exr.zip* from *www.cadcam.com*. The path of the file is as follows: *Textbooks > Animation and Visual Effects > Softimage > Autodesk Softimage 2014: A Tutorial Approach*

## Exercise 1

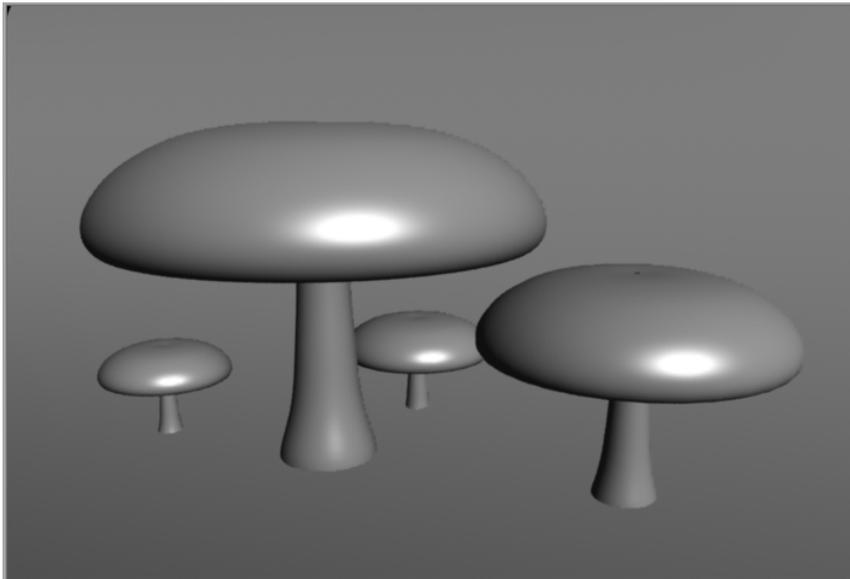
Create the different models of wine glass, as shown in Figure 3-52, using the **Draw Cubic by CVs** and **Revolution Along Axis** tools. (Expected time: 20 min)



*Figure 3-52 The models of wine glass*

## Exercise 2

Create the models of mushroom, as shown in Figure 3-53, using the **Draw Cubic by CVs** and **Revolution Along Axis** tools. (Expected time: 30 min)



*Figure 3-53 The models of mushroom*

### Exercise 3

Create a model of the bulb, as shown in Figure 3-54, using the rotoscoping technique. You can access the *bulb.jpeg* image by downloading *c02\_softimage\_2014\_exr.zip* file from [www.cadcam.com](http://www.cadcam.com).

(Expected time: 20 min)



Figure 3-54 The model of bulb

### Exercise 4

Create a model of dining table and chairs using the **Loft** tool, as shown in Figure 3-55.

(Expected time: 35 min)



Figure 3-55 The model of dining table and chairs

**Answers to Self-Evaluation Test**

1. d, 2. c, 3. F12, 4. Loft, 5. T