Chapter 3

Introduction to Polygon Modeling

Learning Objectives

After completing this chapter, you will be able to:

- *Create polygon primitives*
- *Work with various polygon modeling tools*

INTRODUCTION

In the previous chapters, you learned to create 3D objects and shapes using the spline modeling techniques. In CINEMA 4D, you can modify the objects at an advanced level by converting them into editable polygons. The converted objects consist of sub-objects that can be modified using the **Move**, **Rotate**, and **Scale** tools. The sub-objects are points, edges, and polygons. In this chapter, you will learn to modify the objects at an advanced level by converting them into polygons.

TUTORIALS

Before you start the tutorials of this chapter, you need to download the *c03_cinema4d_r20_tut.zip* file from *www.cadcim.com*. The path of the file is as follows: *Textbooks > Animation and Visual Effects > MAXON CINEMA 4D > MAXON CINEMA 4D R20 Studio: A Tutorial Approach*

Next, you need to browse to *\Documents\c4dR20* and create a new folder in it with the name *c03*. Next, extract the contents of the zip file in this folder.

Tutorial 1

In this tutorial, you will create 3D model of a computer mouse, as shown in Figure 3-1, using the polygon modeling techniques. **(Expected time: 35 min)**

Figure 3-1 *The model of a computer mouse*

The following steps are required to complete this tutorial:

a. Create the body of the computer mouse.
b. Create the left-click and right-click buttons of the mouse.
c. Create the scroll wheel of the mouse.
d. Create the bottom of the mouse.
e. Create the USB cable of the mouse.
f. Change the background color of the scene.
g. Save and render the scene.

Creating the Body of the Computer Mouse

In this section, you will create the body of the computer mouse using the **Cube** tool.

1. Choose **Create > Object** from the main menu; a cascading menu is displayed. Next, choose **Cube** from it; a cube is created in the Perspective viewport, as shown in Figure 3-2, and *Cube* is added to the Object Manager.

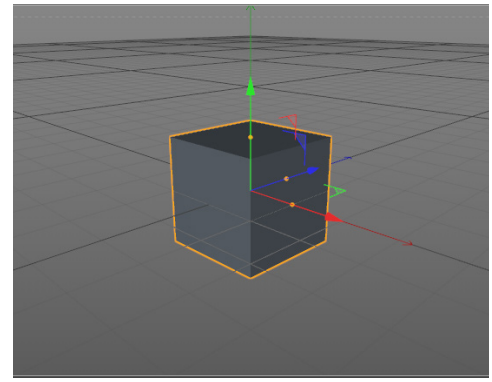

Figure 3-2 *Cube created in the Perspective viewport*

2. In the Attribute Manager, make sure the **Object** button is chosen. In the **Object Properties** area, set the parameters as follows:

Size . X: **91**	Size . Y: **37**	Size . Z: **137**
Segments X: **6**	Segments Y: **4**	Segments Z: **6**

The **Size . X**, **Size . Y**, and **Size . Z** parameters in the **Object Properties** area are used to set width, height, and depth, respectively of the cube.

3. In the Attribute Manager, choose the **Basic** button; the **Basic Properties** area is displayed. In this area, enter **Computer mouse** in the **Name** text box; *Cube* is renamed as *Computer mouse* in the Object Manager.

4. Make sure *Computer mouse* is selected in the Object Manager and choose the **Make Editable** tool from the Modes Palette; *Computer mouse* is converted into a polygon object.

Note

After converting Computer mouse into a polygon object, you will notice that when you hover the cursor over it, the name of the Computer mouse changes to ***Polygon Object [Computer mouse]*** *on hovering the cursor on it. Also, the icon of the Cube object changes into a triangle.*

5. Press F2; the Top viewport is maximized. Choose the **Points** tool from the Modes Palette; the *Computer mouse* is displayed in the points mode.

6. Invoke the **Live Selection** tool from the Command Palette. The shape of the cursor changes. To increase or decrease the size of the cursor, press the } or { key, respectively. In the Attribute Manager, make sure the **Options** button is chosen. In the **Options** area, clear the **Only Select Visible Elements** check box, if not already cleared.

The **Only Select Visible Elements** check box is cleared to select the polygons that are behind the visible sub-objects.

7. Using the **Live Selection** tool and the SHIFT key, select the corner points of *Computer mouse*, as shown in Figure 3-3.

8. Invoke the **Scale** tool from the Command Palette and scale the selected points uniformly in the Top viewport, as shown in Figure 3-4.

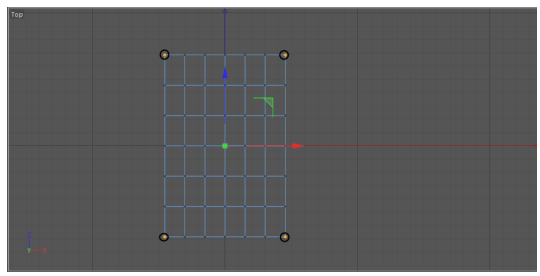

Figure 3-3 *The corner points of Computer mouse to be selected*

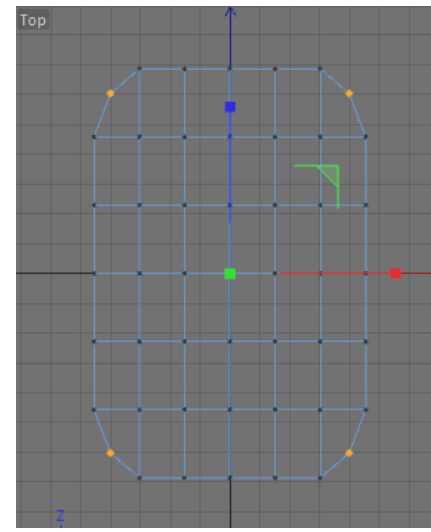

Figure 3-4 *Scaling the selected points of Computer mouse*

9. Deselect the corner points of *Computer mouse* by clicking on the empty area of the viewport. Invoke the **Live Selection** tool from the Command Palette and select the center points of *Computer mouse* in the Top viewport by dragging the cursor on them, as shown in Figure 3-5.

10. Invoke the **Scale** tool from the Command Palette and scale the selected points in the Top viewport, as shown in Figure 3-6.

11. Press and hold the 9 key on the main keyboard to temporarily invoke the **Live Selection** tool and then select the center points of *Computer mouse* in the Top viewport, as shown in Figure 3-7. Now, release the 9 key.

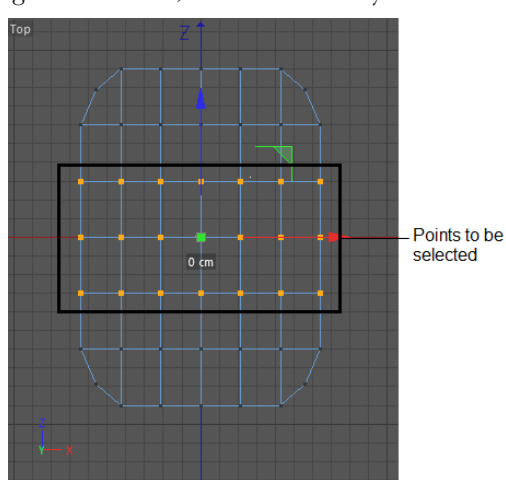

Figure 3-5 *The points to be selected*

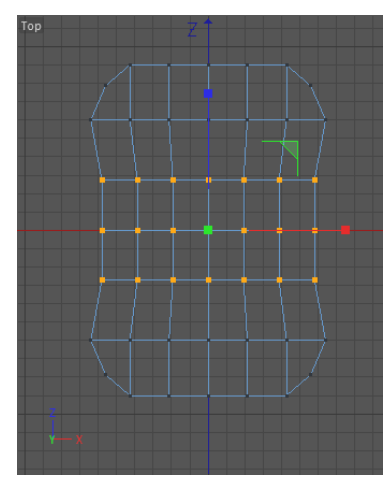

Figure 3-6 *Scaling the selected points of Computer mouse*

On releasing the 9 key, the **Scale** tool is activated which is the last used tool.

12. Scale the selected points inward in the Top viewport, as shown in Figure 3-8.

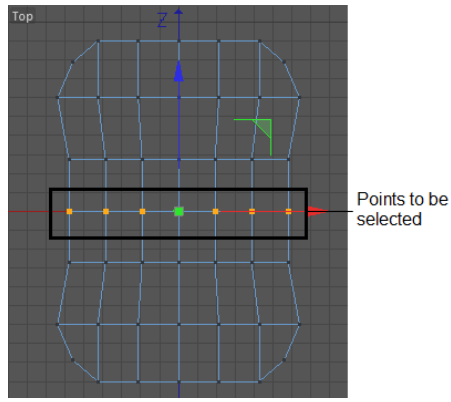

Figure 3-7 *The center points to be selected*

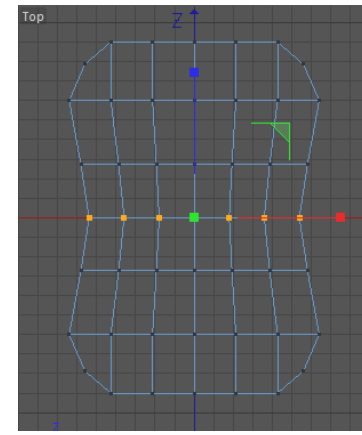

Figure 3-8 *Scaling the selected points of Computer mouse*

13. Press and hold the 9 key and select the top and bottom points of *Computer mouse* by using the SHIFT key, as shown in Figure 3-9. Next, release the 9 and SHIFT keys. Now, scale the selected points along the Z-axis, as shown in Figure 3-10.

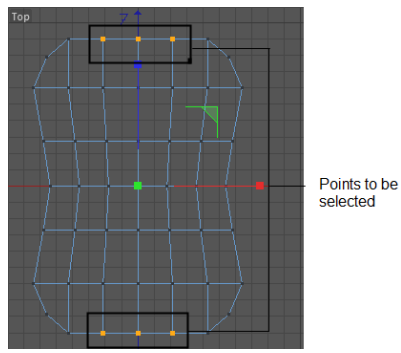

Figure 3-9 *The selected points of Computer mouse*

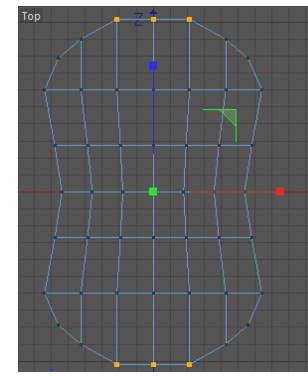

Figure 3-10 *Scaling the selected points of Computer mouse*

14. Press and hold the 9 key and select the top and bottom center points of *Computer mouse* using the SHIFT key, as shown in Figure 3-11.

15. Scale the selected points along the Z-axis in the Top viewport, as shown in Figure 3-12.

16. Press F3; the Right viewport is maximized. Invoke the **Live Selection** tool from the Command Palette. In the Attribute Manager, make sure the **Options** button is chosen. In the **Options** area, make sure that the **Only Select Visible Elements** check box is cleared.

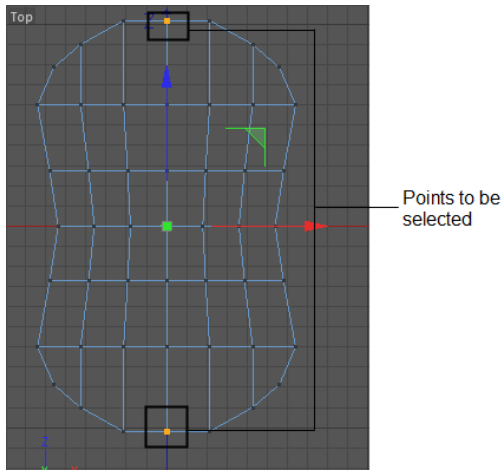

Figure 3-11 *The top and bottom center points of Computer mouse selected*

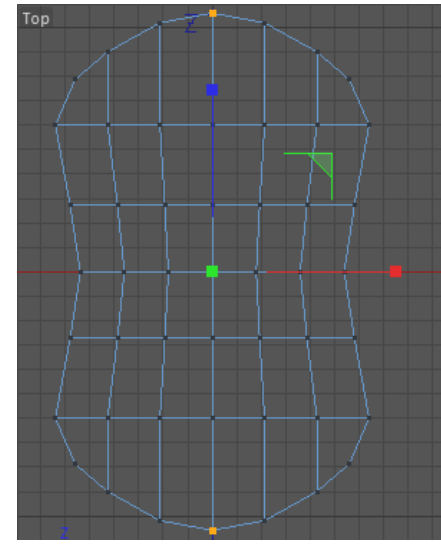

Figure 3-12 *Scaling the selected points of Computer mouse*

17. Using the **Live Selection** tool, select the center points of *Computer mouse* in the Right viewport, as shown in Figure 3-13. Next, move the selected points upward in the Right viewport, as shown in Figure 3-14.

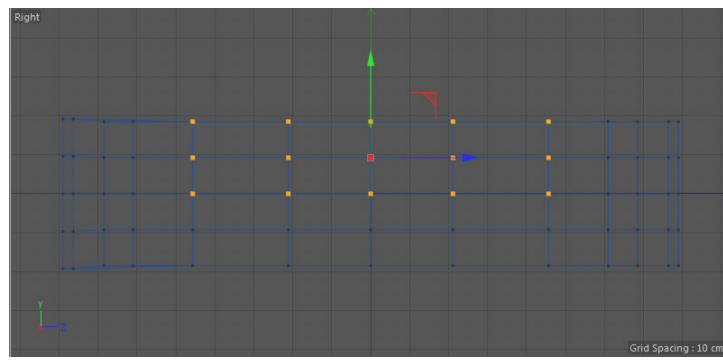

Figure 3-13 *The points to be selected*

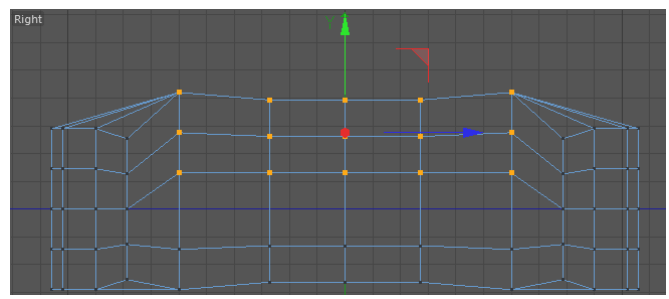

Figure 3-14 *Moving the selected points of Computer mouse*

18. Select the top points of *Computer mouse* in the Right viewport, as shown in Figure 3-15. Next, move the selected points upward in the Right viewport, as shown in Figure 3-16.

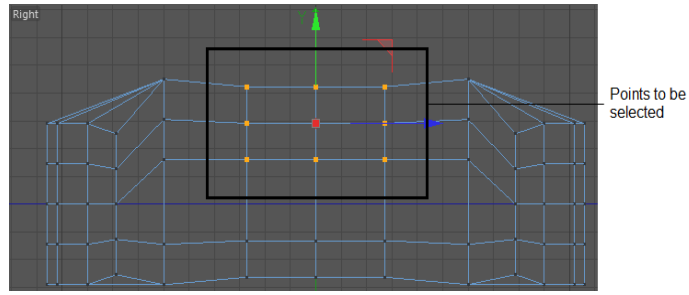

Figure 3-15 *The selected points of Computer mouse*

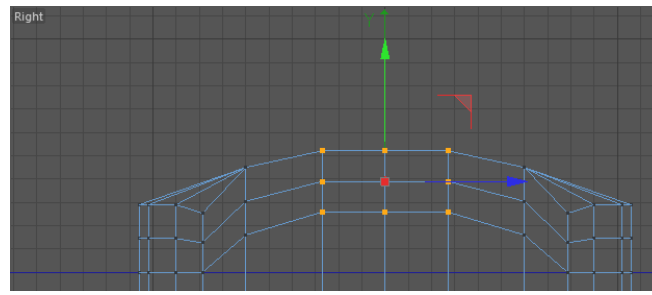

Figure 3-16 *Moving the selected points of Computer mouse*

19. Select the top center points of *Computer mouse*, as shown in Figure 3-17. Move the selected points upward in the Right viewport, as shown in Figure 3-18.

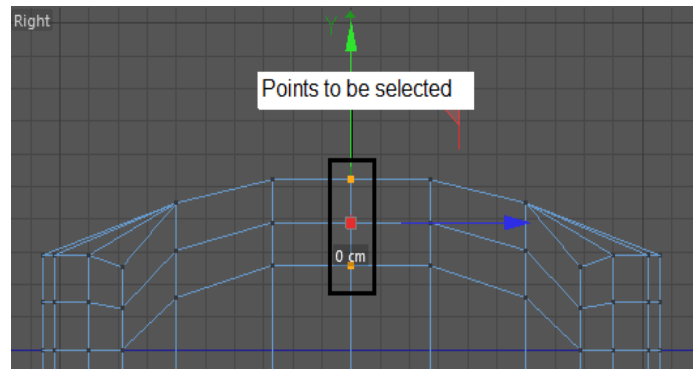

Figure 3-17 *The top center points of Computer mouse selected*

20. Select the points of *Computer mouse* in the Right viewport, as shown in Figure 3-19.

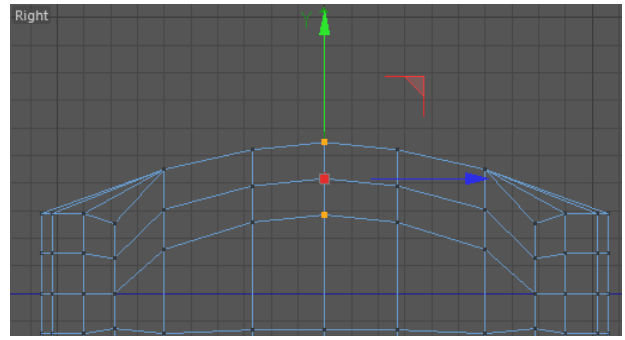

Figure 3-18 *Moving the selected points of Computer mouse*

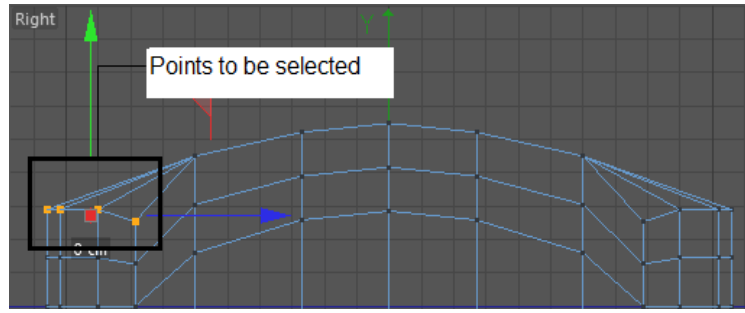

Figure 3-19 *The points to be selected*

21. Invoke the **Rotate** tool from the Command Palette and rotate the selected points along the YZ axis in the Right viewport, as shown in Figure 3-20.

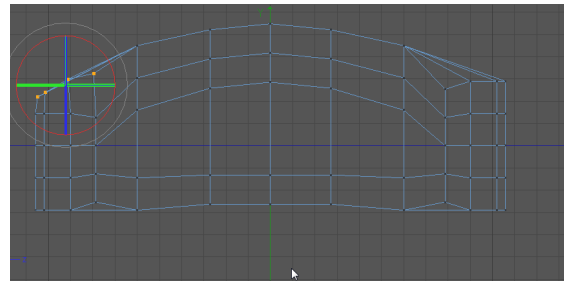

Figure 3-20 *Rotating the selected points of Computer mouse*

22. Select the points of *Computer mouse* in the Right viewport using the 9 key, as shown in Figure 3-21. Next, rotate the selected points along the YZ axis in the Right viewport, as shown in Figure 3-22.

23. Press F4; the Front viewport is maximized. Invoke the **Live Selection** tool from the Command Palette. In the Attribute Manager, make sure the **Options** button is chosen. In the **Options** area, make sure that the **Only Select Visible Elements** check box is cleared.

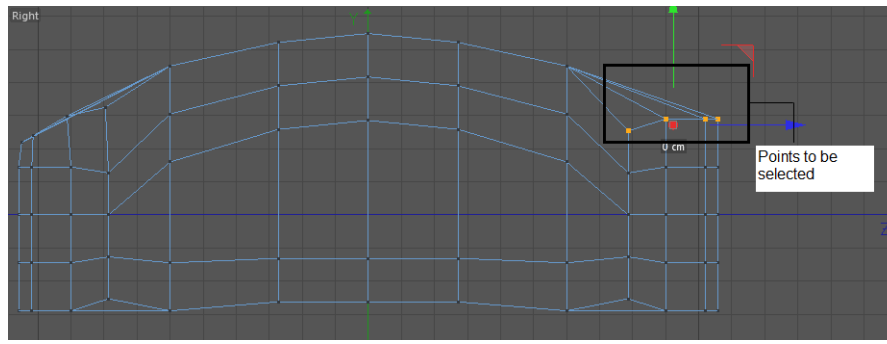

Figure 3-21 *The points to be selected*

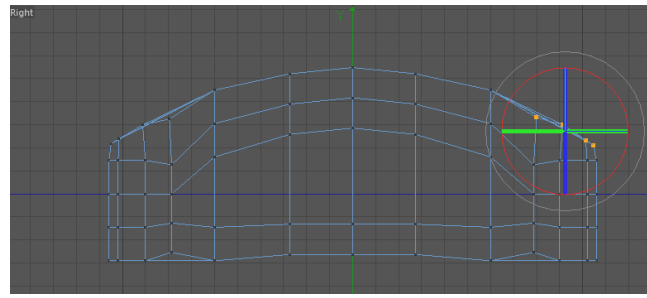

Figure 3-22 *Rotating the selected points of Computer mouse*

24. Select the center points of *Computer mouse* in the Front viewport, as shown in Figure 3-23. Next, move the selected points upward in the Front viewport, as shown in Figure 3-24.

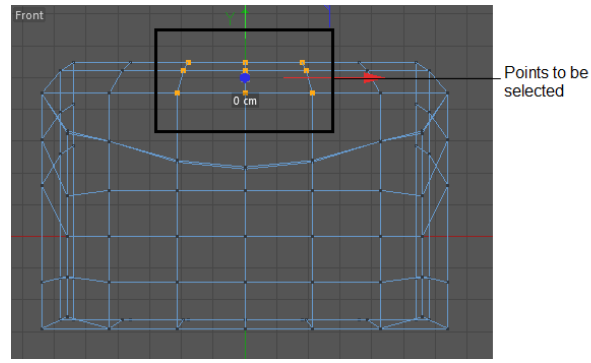

Figure 3-23 *The points to be selected*

25. Select the points of *Computer mouse* using the 9 key, as shown in Figure 3-25. Next, move the selected points upward in the Front viewport, as shown in Figure 3-26.

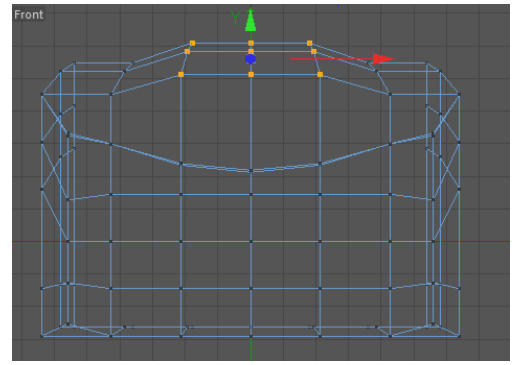

Figure 3-24 *Moving the selected points upward*

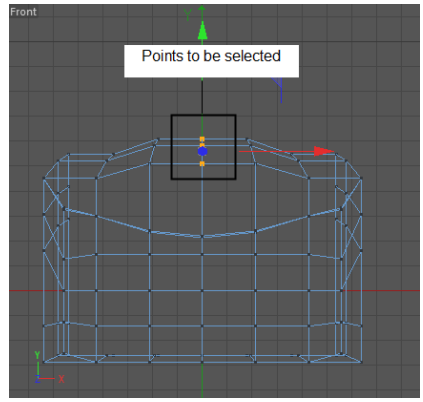

Figure 3-25 *The selected points of Computer mouse*

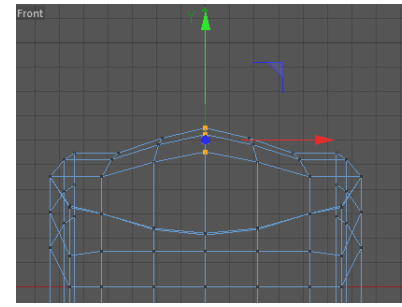

Figure 3-26 *Moving the selected points of Computer mouse*

26. Select the points of *Computer mouse* using the 9 and SHIFT keys, as shown in Figure 3-27. Next, move the selected points upward in the Front viewport, as shown in Figure 3-28.

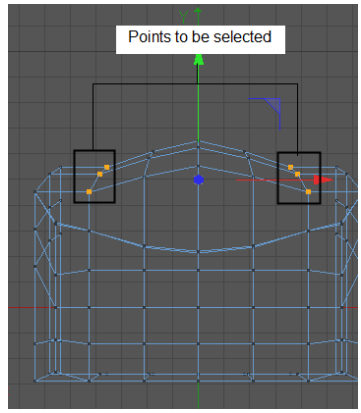

Figure 3-27 *The points to be selected*

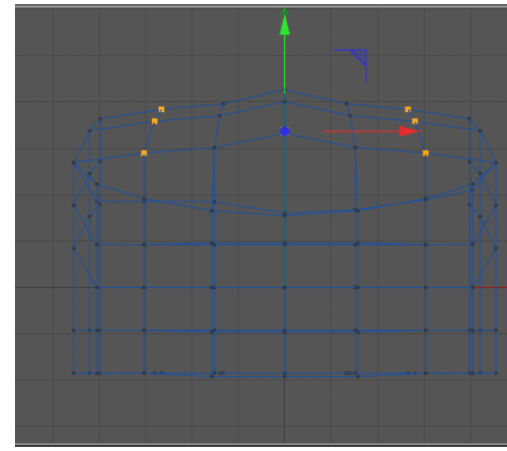

Figure 3-28 *Moving the selected points of Computer mouse*

27. Press F1; the Perspective viewport is maximized. Choose the **Edges** tool from the Modes Palette; *Computer mouse* is displayed in the edge mode.

28. Select the edges of *Computer mouse* in the Top viewport using the 9 and SHIFT keys, as shown in Figure 3-29.

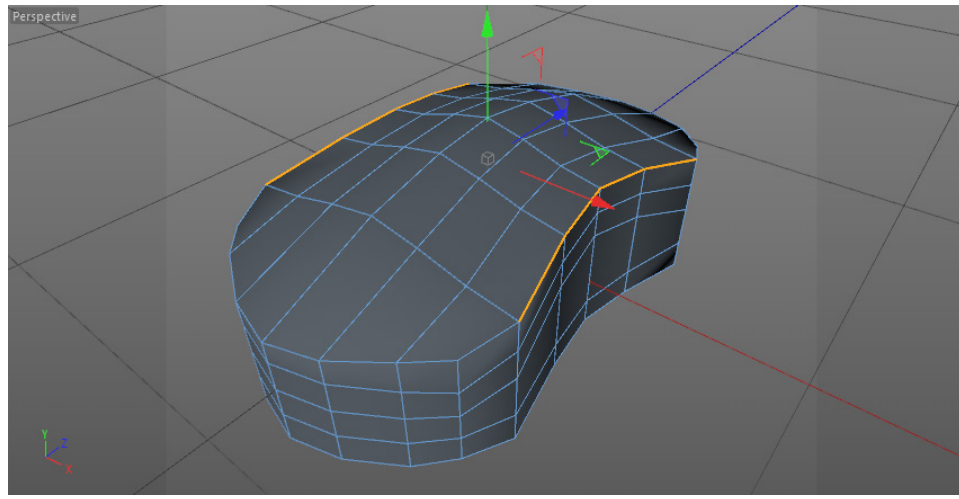

Figure 3-29 *The selected edges in the Perspective viewport*

29. Invoke the **Scale** tool from the Command Palette and scale down the selected edges to 95 percent along the x-axis, as shown in Figure 3-30.

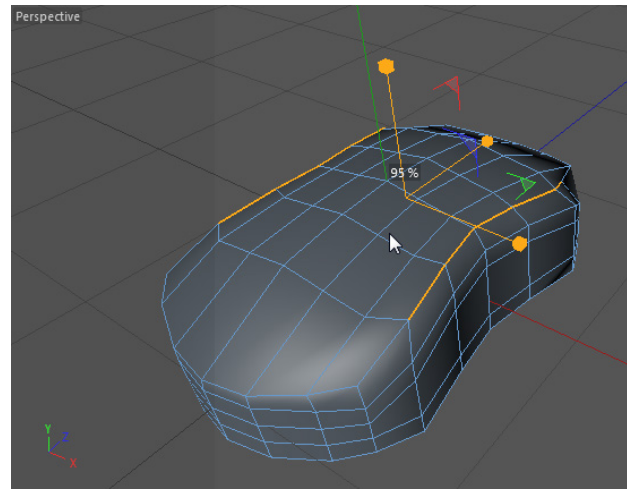

Figure 3-30 *Scaling down the edges of Computer mouse in the Perspective viewport*

30. Press F3; the Right viewport is maximized. Choose the **Points** tool from the Modes Palette; the *Computer mouse* is displayed in the points mode.

31. Select the points of *Computer mouse* in the Right viewport using the 9 key, as shown in Figure 3-31.

32. Invoke the **Move** tool from the Command Palette and move the selected points upward in the Right viewport, as shown in Figure 3-32.

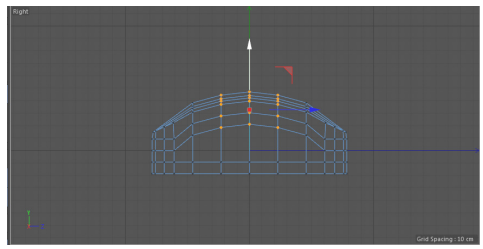

Figure 3-31 *The points to be selected*

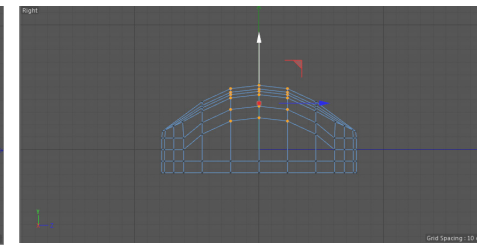

Figure 3-32 *Moving the selected points of Computer mouse*

33. Select the center points of *Computer mouse* using the 9 key, as shown in Figure 3-33.

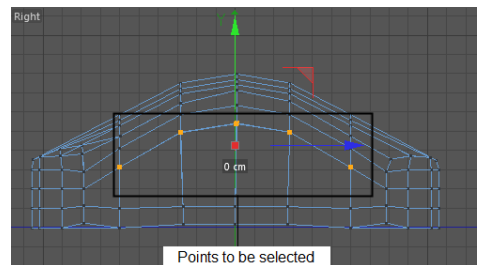

Figure 3-33 *The points to be selected*

34. Invoke the **Scale** tool from the Command Palette. Scale the selected points downward along the Y-axis and then move them downwards to get a straight line in the Right viewport, as shown in Figure 3-34.

35. Select the points of *Computer mouse* using the 9 key, as shown in Figure 3-35. Next, scale the selected points along the Y axis to 87.2 percent in the Right viewport, as shown in Figure 3-36.

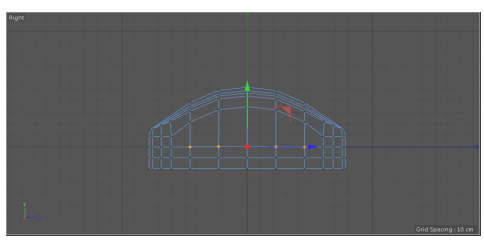

Figure 3-34 *Scaling and moving the points of Computer mouse*

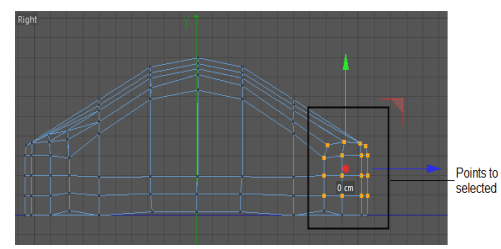

Figure 3-35 *The points of Computer mouse to be selected*

36. Invoke the **Move** tool from the Command Palette and move the selected points downward in the Right viewport, as shown in Figure 3-37.

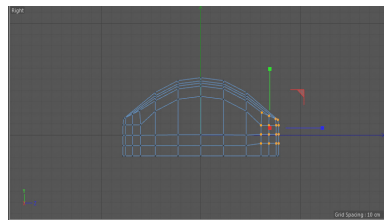

Figure 3-36 *Scaling the points of Computer mouse*

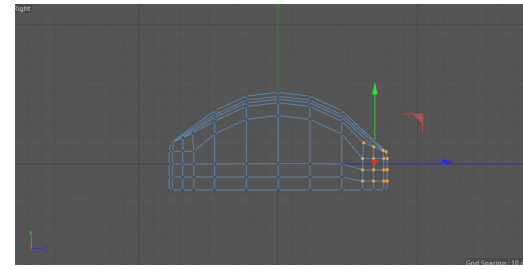

Figure 3-37 *Moving the selected points in the Right viewport*

37. Select the bottom points of *Computer mouse* using the 9 key, refer to Figure 3-38. Next, invoke the **Scale** tool and scale the selected points to get a straight line in the Right viewport, if they are not straight, as shown in Figure 3-38.

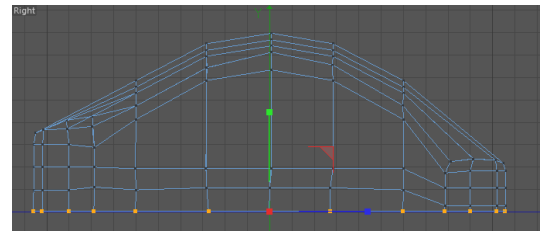

Figure 3-38 *Scaling the points of Computer mouse*

Creating the Left-Click and Right-Click Buttons of the Mouse

In this section, you will create the left-click and the right-click buttons of *Computer mouse*.

1. Press F1; the Perspective viewport is maximized. Choose the **Edges** tool from the Modes Palette; the *Computer mouse* is displayed in the edge mode.

2. Right-click in the empty area of the Perspective viewport; a shortcut menu is displayed. Choose **Loop/Path Cut** from the shortcut menu; the **Loop/Path Cut** tool settings are displayed in the Attribute Manager. In the **Options** area, make sure **Loop** is selected in the **Mode** drop-down list.

3. Make sure the **Enable Snap** tool is deactivated in the Modes Palette. In the **Options** area, make sure the **Restrict to Selection** check box is cleared and then click on the right of the middle edge loop of the *Computer mouse* in the Perspective viewport, as shown in Figure 3-39; a new edge is created next to it, as shown in Figure 3-40.

   When you create an edge loop using the **Loop/Path Cut** tool, you can interactively slide the edge loop using the slider that appears at the top of the viewport, as shown in Figure 3-41.

4. Again, create three new edge loops using the **Loop/Path Cut** tool, refer to Figures 3-42 and 3-43.

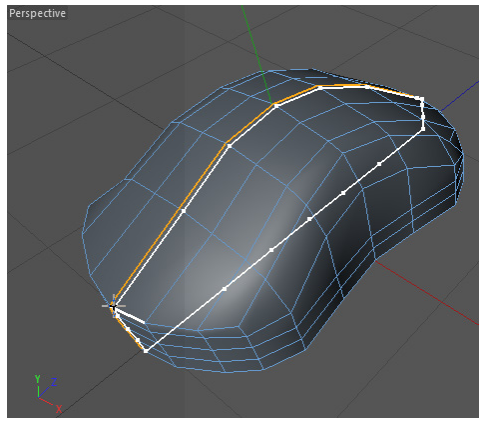

Figure 3-39 *Clicking on the right of the middle edge loop*

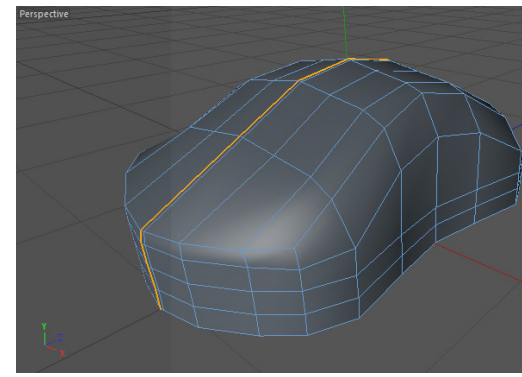

Figure 3-40 *A new edge loop added to the Computer mouse*

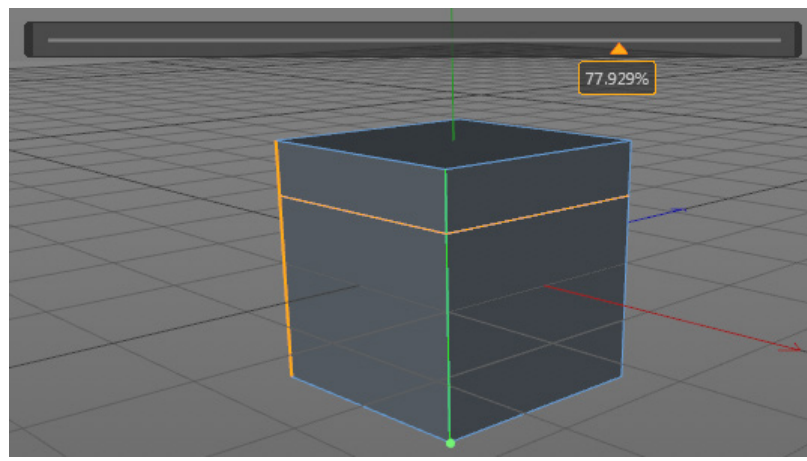

Figure 3-41 *The slider displayed at the top of the viewport*

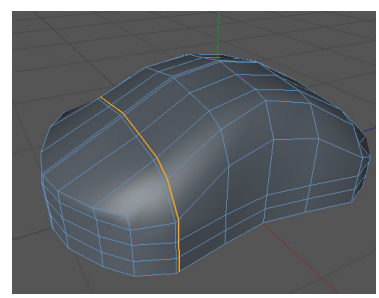

Figure 3-42 *A new edge added to Computer mouse*

5. Choose the **Live Selection** tool from the Command Palette and then choose the **Polygons** tool from the Modes Palette; the *Computer mouse* is displayed in the polygon mode. In the

Attribute Manager, choose the **Options** button; the **Options** area is displayed. In this area, select the **Only Select Visible Elements** check box, if not already selected. Next, using the **Live Selection** tool, select the polygons of *Computer mouse* in the Perspective viewport, as shown in Figure 3-44. If required, decrease the size of the selection cursor.

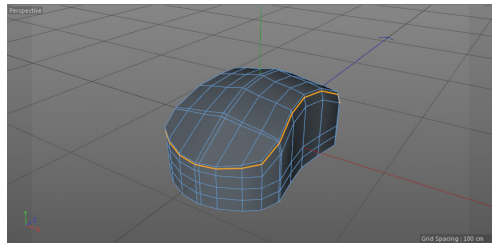

Figure 3-43 *A new edge added to Computer mouse*

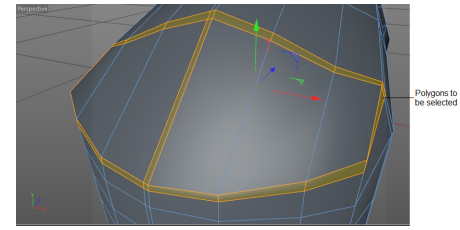

Figure 3-44 *The polygons selected*

6. In the Perspective viewport, right-click on the selected polygons of *Computer mouse*; a shortcut menu is displayed. Choose **Extrude** from the shortcut menu; the **Extrude** tool settings are displayed in the Attribute Manager. Choose the **Options** button; the **Options** area is displayed. Specify the value **-1** in the **Offset** spinner and then press ENTER; the selected polygons of *Computer mouse* are extruded, as shown in Figure 3-45.

7. Right-click on the empty area of the Perspective viewport; a shortcut menu is displayed. Choose **Loop/Path Cut** from the shortcut menu; the **Loop/Path Cut** tool settings are displayed in the Attribute Manager. In the **Options** area, make sure that **Loop** is selected in the **Mode** drop-down list.

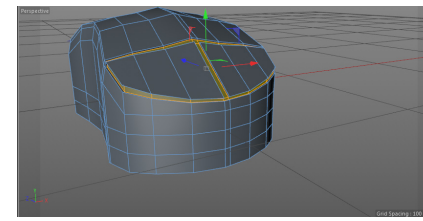

Figure 3-45 *The extruded polygons of Computer mouse*

8. Using the **Loop/Path Cut** tool, create an edge, refer to Figure 3-46.

9. Add two more edges, refer to Figures 3-47 and 3-48. Figure 3-49 shows the edges.

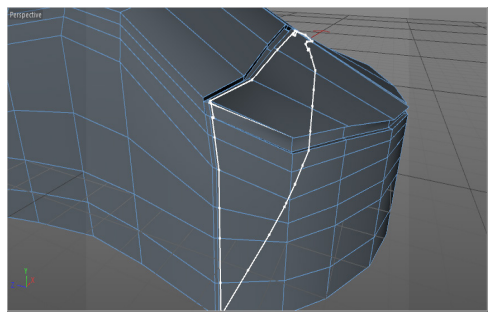

Figure 3-46 *An edge loop added to Computer mouse*

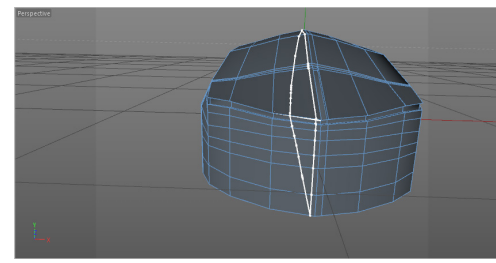

Figure 3-47 *An edge loop added to Computer mouse*

10. To smoothen the surface of the Computer mouse, choose the **Subdivision Surface** tool from the Command Palette; **Subdivision Surface** is added to the Object Manager. Next, select *Computer mouse* in the Object Manager and press and hold the left mouse button and then

drag it on the **Subdivision Surface**; the *Computer mouse* is connected to the **Subdivision Surface** and the smoothened result is displayed, as shown in Figure 3-50.

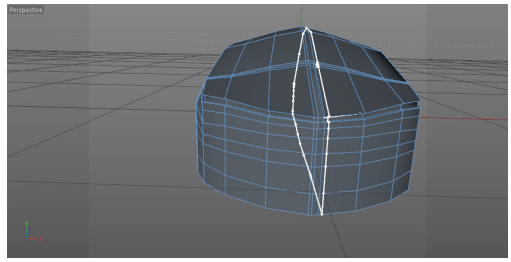

Figure 3-48 *An edge loop added to Computer mouse*

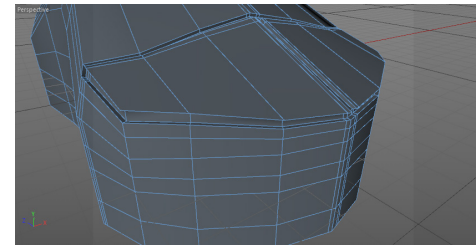

Figure 3-49 *The edges added to Computer mouse*

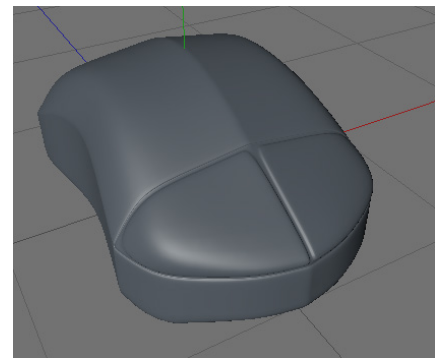

Figure 3-50 *The smoothened Computer mouse*

Creating the Scroll Wheel of the Mouse

In this section, you will create the scroll wheel of the *Computer mouse*.

1. Choose **Create > Object** from the main menu; a cascading menu is displayed. Next, choose **Torus** from it; a torus is created in the Perspective viewport and *Torus* is added to the Object Manager.

2. In the Attribute Manager, choose the **Basic** button; the **Basic Properties** area is displayed. In this area, enter **Scroll wheel** in the **Name** text box; *Torus* is renamed as *Scroll wheel* in the Object Manager.

3. In the Attribute Manager, choose the **Object** button; the **Object Properties** area is displayed. In this area, set the parameters as follows:

   Ring Radius: **6** Pipe Radius: **2** Pipe Segments: **7**
   Orientation: **-X**

4. Make sure that *Scroll wheel* is selected in the Object Manager. Invoke the **Move** tool from the Command Palette and place *Scroll wheel* on *Computer mouse*, as shown in Figure 3-51.

Creating the Bottom of the Mouse

In this section, you will create the bottom of *Computer mouse*.

1. Choose **Cameras** in Menu in editor view in the Perspective viewport; a flyout is displayed. Choose **Bottom** from the flyout; the Bottom viewport is displayed.

2. Select the *Computer mouse* in the Object Manager. Make sure the **Polygons** tool is chosen from the Modes Palette; the *Computer mouse* is displayed in the polygon mode. Make sure the **Live Selection** tool is chosen from the Standard palette. In the Attribute Manager, choose the **Options** button; the **Options** area is displayed. In this area, make sure the **Only Select Visible Elements** check box is selected. Select the polygons of *Computer mouse*, as shown in Figure 3-52.

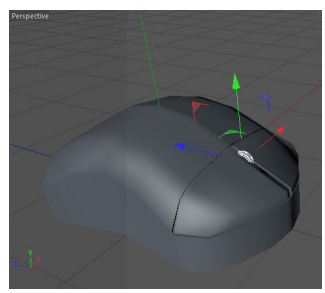

Figure 3-51 *The Scroll wheel placed on Computer mouse*

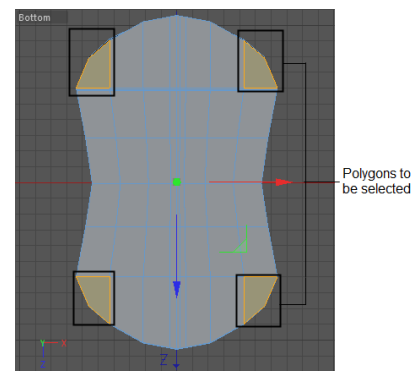

Figure 3-52 *The selected polygons of Computer mouse*

3. In the Bottom viewport, right-click on the selected polygons of *Computer mouse*; a shortcut menu is displayed. Choose **Extrude Inner** from the shortcut menu; the **Extrude Inner** tool settings are displayed in the Attribute Manager. Choose the **Options** button; the **Options** area is displayed. Specify the value **3** in the **Offset** spinner and then press ENTER; the selected polygons of the *Computer mouse* are extruded.

4. In the Perspective viewport, right-click on the selected polygons of *Computer mouse*; a shortcut menu is displayed. Choose **Extrude** from the shortcut menu; the **Extrude** tool settings are displayed in the Attribute Manager. Choose the **Options** button; the **Options** area is displayed. Specify the value **1.5** in the **Offset** spinner and then press ENTER; the selected polygons of the *Computer mouse* are extruded.

5. Choose **Cameras** from the Menu in editor view; a flyout is displayed. Choose **Perspective** from the flyout; the Perspective viewport is maximized.

Creating the USB Cable of the Mouse

In this section, you will create the USB cable of *Computer mouse* using the **Sweep NURBS** tool.

1. Choose **Create > Spline** from the main menu; a cascading menu is displayed. Next, choose **Circle** from it; a circle is created in the Perspective viewport and *Circle* is added to the Object Manager.

2. Make sure that *Circle* is selected in the Object Manager. In the Attribute Manager, make sure the **Object** button is chosen. In the **Object Properties** area, enter **2** in the **Radius** spinner.

3. In the Attribute Manager, choose the **Coord** button; the **Coord** area is displayed. In this area, enter **-80** in the **P . Z** spinner; the *Circle* is positioned in the Perspective viewport.

4. Press F2; the Top viewport is maximized. Choose **Create > Spline** from the main menu; a cascading menu is displayed. Choose **Pen** from it. Next, create a curve in the Top viewport, as shown in Figure 3-53. Press ESC to exit the **Pen** tool.

5. Press and hold the left mouse button on the **Subdivision Surface** tool from the Command Palette; a flyout is displayed. Choose the **Sweep** tool from the flyout; the *Sweep* is added to the Object Manager.

6. In the Object Manager, press and hold the left mouse button on *Spline* and drag it to *Sweep*; the *Spline* is connected to *Sweep*. Next, press and hold the left mouse button on *Circle* and drag it to *Sweep*; *Circle* is connected to *Sweep*. You will notice that a wire is created in the Top viewport.

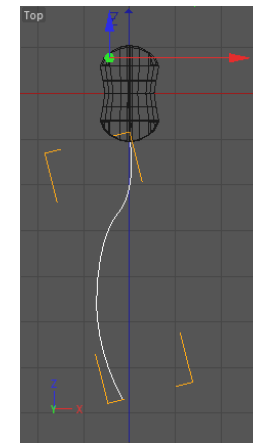

Figure 3-53 *Spline created in the Top viewport*

Next, you will create the USB port of *Computer mouse*.

7. Choose **Create > Object** from the main menu; a cascading menu is displayed. Next, choose **Cube** from it; a cube is created in the Top viewport and a *Cube* is added to the Object Manager.

8. Make sure that *Cube* is selected in the Object Manager. In the Attribute Manager, choose the **Object** button; the **Object Properties** area is displayed. In this area, set the parameters as follows:

Size . X: **28**	Size . Y: **8**	Size . Z: **62**
Segments X: **10**	Segments Y: **10**	Segments Z: **10**

9. Invoke the **Move** tool from the Command Palette and move *Cube* in the Top viewport to place it, as shown in Figure 3-54.

10. Make sure *Cube* is selected in the Object Manager. Next, choose the **Make Editable** tool from the Modes Palette; the *Cube* is converted into a polygonal object.

11. Choose the **Edges** tool from the Modes Palette; the *Cube* is displayed in the edge mode. Choose the **Live Selection** tool from the Command Palette. In the Attribute Manager, make sure the **Only Select Visible Elements** check box is cleared in the **Options** area. Next, select the edges of *Cube* in the Top viewport, as shown in Figure 3-55.

12. Invoke the **Scale** tool from the Command Palette and scale down the selected edges to 70 percent uniformly.

13. Choose the **Points** tool from the Modes Palette; *Cube* is displayed in the points mode. Select the points of *Cube* using the 9 and SHIFT keys, as shown in Figure 3-56.

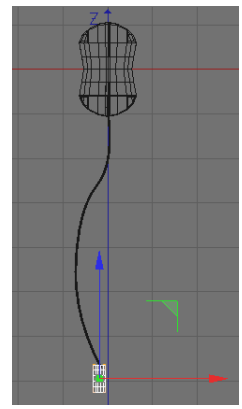

Figure 3-54 *Cube placed in the Top viewport*

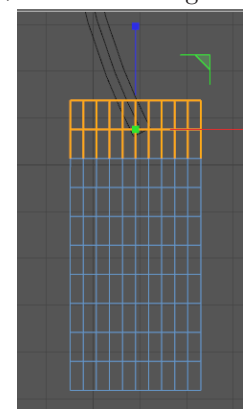

Figure 3-55 *The edges to be selected in the Top viewport*

14. Scale down the selected points along the X axis to get the shape, as shown in Figure 3-57.

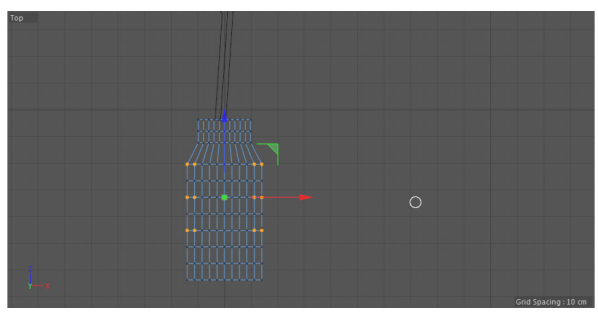

Figure 3-56 *The points to be selected*

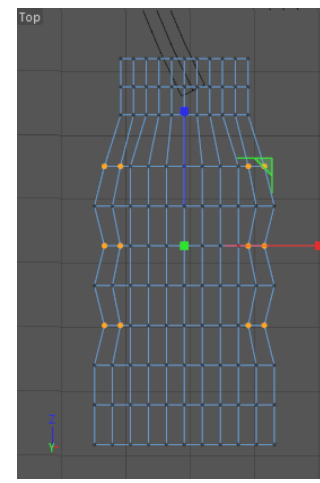

Figure 3-57 *Scaling the selected points*

15. Choose the **Edges** tool from the Modes Palette; *Cube* is displayed in the edge mode. Choose the **Live Selection** tool from the Command Palette. In the Attribute Manager, select the **Only Select Visible Elements** check box in the **Options** area. Select the edges of *Cube* in the Top viewport, as shown in Figure 3-58.

16. Scale down the selected edges along the X and Y axis to get the shape, as shown in Figure 3-59.

17. Press F1; the Perspective viewport is maximized. Choose the **Polygons** tool from the Modes Palette; *Cube* is displayed in the polygon mode. Select the polygons of *Cube* using the 9 key, as shown in Figure 3-60. Make sure the **Only Selected Visible Elements** check box is cleared.

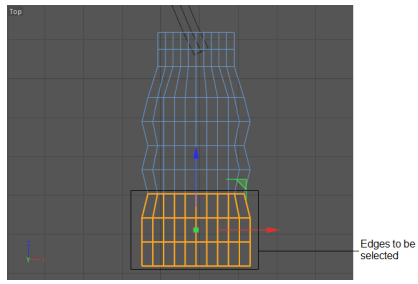

Figure 3-58 *The edges selected*

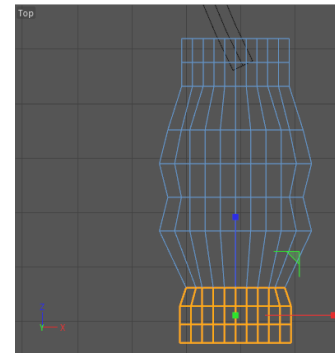

Figure 3-59 *Scaling the selected edges*

18. Right-click on the selected polygons of *Computer mouse*; a shortcut menu is displayed. Choose **Extrude** from the shortcut menu; the **Extrude** tool settings are displayed in the Attribute Manager. In the **Extrude** tool settings area, specify the value **10** in the **Offset** spinner and then press ENTER; the selected polygons of *Computer mouse* are extruded, as shown in Figure 3-61.

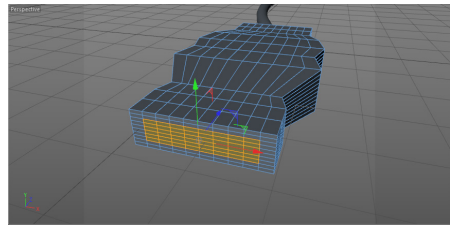

Figure 3-60 *The polygons to be selected*

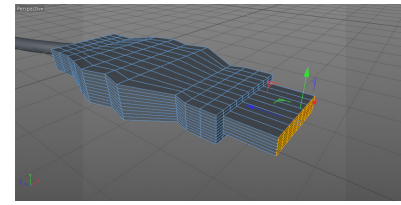

Figure 3-61 *The extruded edge loop*

19. Choose the **Polygons** tool from the Modes Palette. Right-click on the Perspective viewport; a shortcut menu is displayed. Choose **Loop/Path Cut** from the shortcut menu; the **Loop/Path Cut** tool settings are displayed in the Attribute Manager. In the Attribute Manager, make sure **Loop** is selected in the **Mode** drop-down list. Next, add two edges, as shown in Figure 3-62.

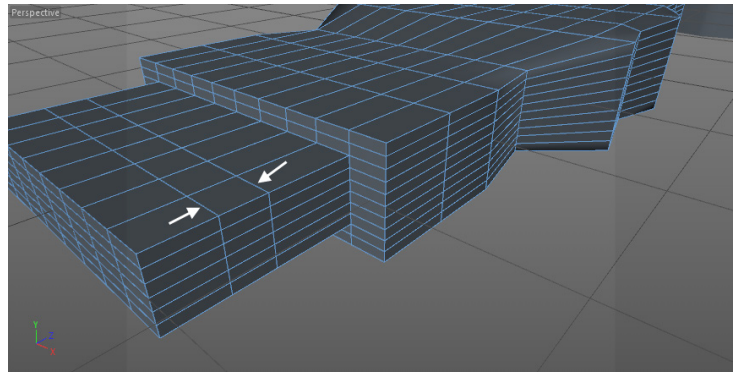

Figure 3-62 *The edges to be added*

20. Choose the **Polygons** tool from the Modes Palette; *Cube* is displayed in the polygon mode. Select the polygons of *Cube* using the **Live Selection** tool, as shown in Figure 3-63. Next, delete the selected polygons of *Cube*, refer to Figure 3-64.

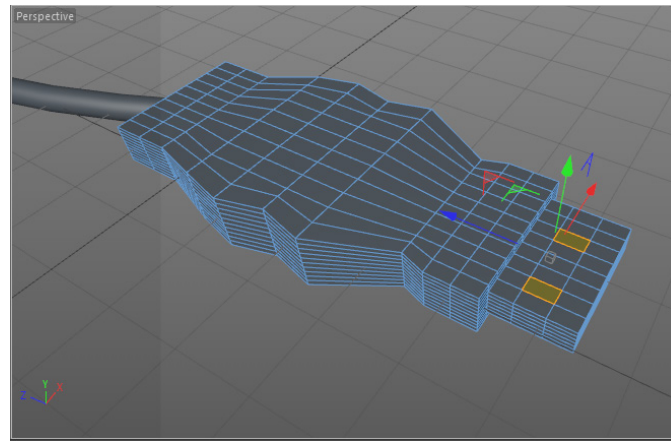

Figure 3-63 *The polygons to be selected*

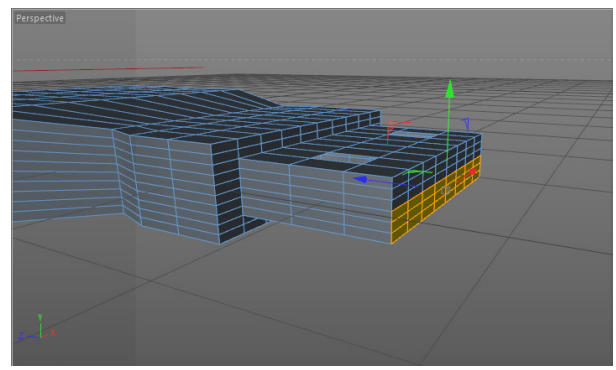

Figure 3-64 *The selected polygons*

21. Again, select the polygons of *Cube* using the **Live Selection tool**, as shown in Figure 3-64. Next, delete the selected polygons of *Cube*, refer to Figure 3-65.

Changing the Background Color of the Scene

To change the background color of the scene to white in the final output, follow the steps given in Tutorial 1 of Chapter 2.

Saving and Rendering the Scene

In this section, you will save and render the scene. You can also view the final render of the scene by downloading the file *c03_cinema4d_R20_rndr.zip* from *www.cadcim.com*. The path of the file is mentioned at the beginning of the chapter.

1. Choose **File > Save** from the main menu; the **Save File** dialog box is displayed. In this dialog box, browse to the location *\Documents\c4dR20\c03*.

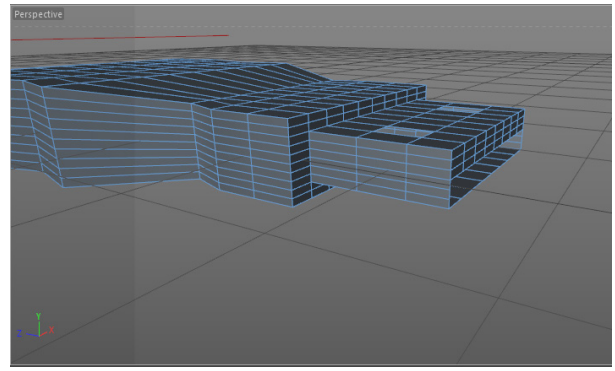

Figure 3-65 *The deleted polygons*

2. Enter **c03tut1** in the **File name** text box and then choose the **Save** button.

3. In the Perspective viewport, set the camera angle using the Viewport Navigation Tools. Next, choose the **Render to Picture Viewer** tool from the Command Palette. Alternatively, press SHIFT+R; the **Picture Viewer** window is displayed.

4. In the **Picture Viewer** window, choose **File > Save as**; the **Save** dialog box is displayed.

5. In the **Save** dialog box, choose the **OK** button; the **Save Dialog** dialog box is displayed. Next, browse to *\Documents\c4dR20\c03*. In the **File Name** text box, type **c03_tut1_rndr**. Next, choose the **Save** button; the file is saved at the desired location.

   Figure 3-1 displays the final output.

Tutorial 2

In this tutorial, you will create the model of a computer table, as shown in Figure 3-66, using the polygon modeling technique. **(Expected time: 35 min)**

Figure 3-66 *The model of computer table*

The following steps are required to complete this tutorial:

a. Create the base of the computer table.
b. Create the support for the CPU.
c. Create the support for the keyboard.
d. Create the base for the monitor.
e. Create the top shelves of the computer table.
f. Create the bottom shelf of the computer table.
g. Create the magazine stand.
h. Change the background color of the scene.
i. Save and render the scene.

Creating the Base of the Computer Table

In this section, you will create the base of the computer table.

1. Press F2; the Top viewport is maximized. Choose **Create > Object** from the main menu; a cascading menu is displayed. Next, choose **Cube** from it; a cube is created in the Top viewport and *Cube* is added to the Object Manager.

2. In the Attribute Manager, choose the **Basic** button; the **Basic Properties** area is displayed. In this area, enter **Computer table** in the **Name** text box; *Cube* is renamed as *Computer table* in the Object Manager.

3. Make sure *Computer table* is selected in the Object Manager. In the Attribute Manager, choose the **Object** button; the **Object Properties** area is displayed. In the **Object Properties** area, set the parameters as follows:

   Size . X: **743** Size . Y: **18** Size . Z: **295**
   Segments X: **6** Segments Y: **6** Segments Z: **6**

   Select the **Fillet** check box and enter **3** in the **Fillet Radius** spinner.

4. Press F1; the Perspective area is maximized. Choose the **Make Editable** tool from the Modes Palette; *Computer table* is converted into a polygonal object.

   Figure 3-67 displays *Computer table* in the Perspective viewport.

5. Choose the **Edges** tool from the Modes Palette; the *Computer table* is displayed in the edge mode. Choose **Select > Loop Selection** from the main menu and then right-click in the Perspective viewport; a shortcut menu is displayed. Choose **Loop/Path Cut** from the shortcut menu; the **Loop/Path Cut** tool settings are displayed in the Attribute Manager.

6. Choose the **Enable Snap** tool from the Modes Palette. Next, click on *Computer mouse*, refer to Figure 3-68; an edge loop is added to *Computer table*. Again, create two new edge loops using the **Loop/Path Cut** tool, as shown in Figure 3-69.

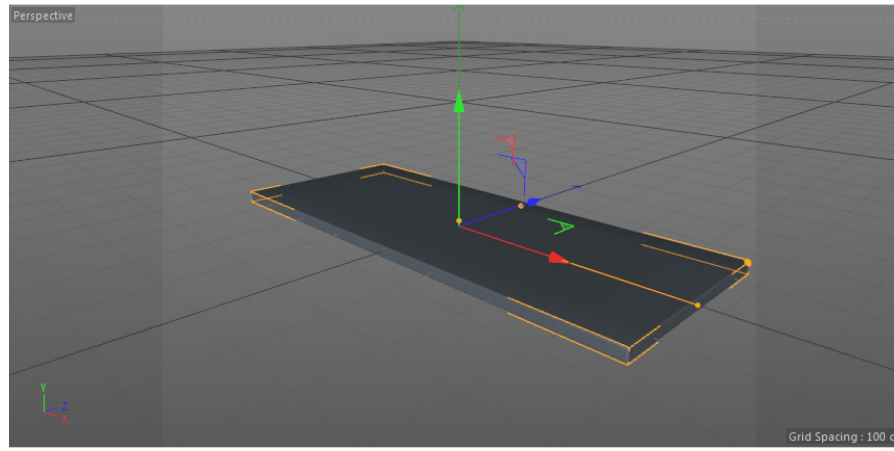

Figure 3-67 *The Computer table in the Perspective viewport*

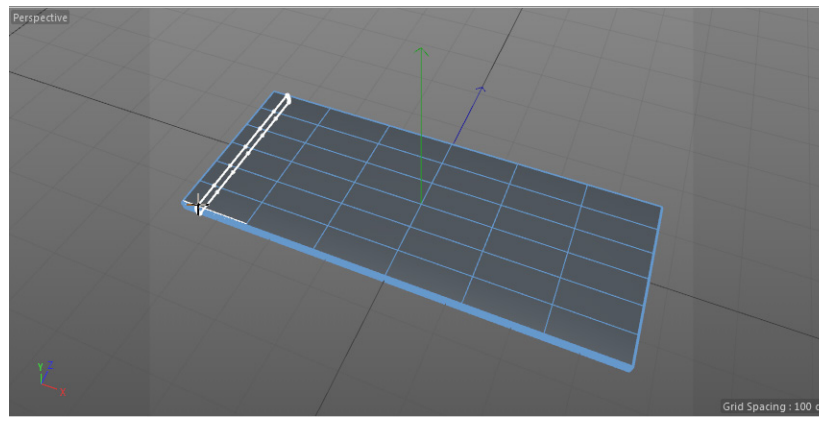

Figure 3-68 *Adding an edge loop*

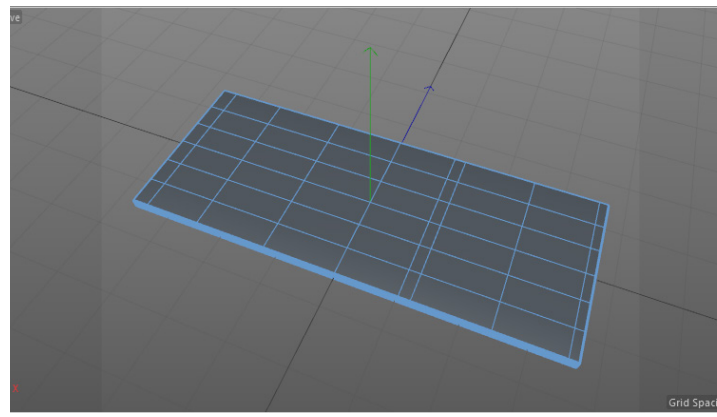

Figure 3-69 *The edge loops added*

Next, you will create the supports for *Computer table*.

7. Choose the **Polygons** tool from the Modes Palette; the *Computer table* is displayed in the polygon mode. Choose **Cameras > Bottom** from the Menu in editor view; the Bottom viewport is maximized. Choose the **Live Selection** tool from the Command Palette and make sure that the **Only Select Visible Elements** check box is selected. Next, enter **1** in the **Radius** spinner. Now, select the polygons of *Computer table*, as shown in Figure 3-70, using the **Live Selection** tool and the SHIFT key.

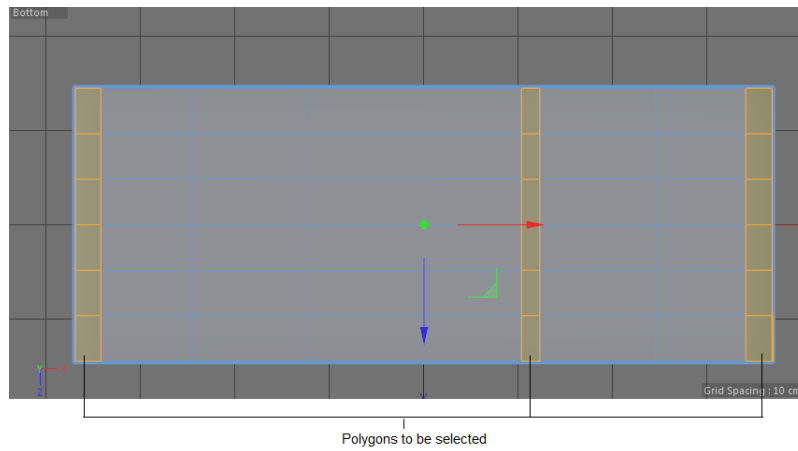

Figure 3-70 *The selected polygons of Computer table*

8. Choose **Cameras > Perspective** from the Menu in editor view; the Perspective viewport is maximized. Right-click in the Perspective viewport; a shortcut menu is displayed. Choose **Extrude** from the shortcut menu; the **Extrude** tool settings are displayed in the Attribute Manager. In the **Extrude** tool settings area, set the value **400** in the **Offset** spinner and then press the ENTER key. Set the value **4** in the **Subdivision** spinner and then press the ENTER key.

   After entering the value, the selected polygons are extruded in the Perspective viewport, as shown in Figure 3-71.

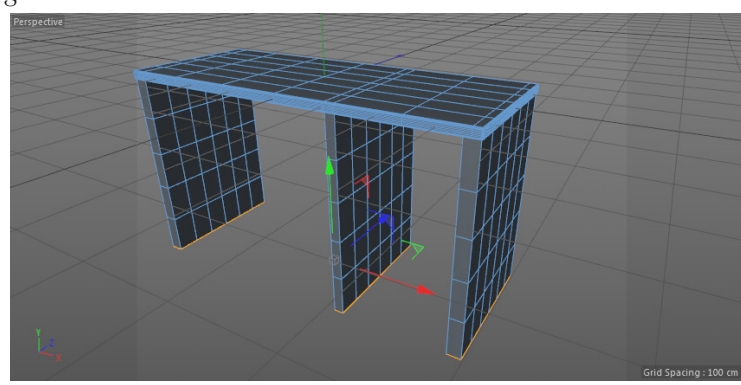

Figure 3-71 *The selected polygons extruded in the Perspective viewport*

Creating the Support for the CPU

In this section, you will create the support for the CPU.

1. Choose the **Edges** tool from the Modes Palette; *Computer table* is displayed in the edge mode. Right-click in the Perspective viewport; a shortcut menu is displayed. Choose **Loop/Path Cut** from the shortcut menu; the **Loop/Path Cut** tool settings are displayed in the Attribute Manager. Make sure **Loop** is selected in the **Mode** drop-down list and the **Restrict to Selection** check box is cleared.

2. Make sure the **Enable Snap** tool is deactivated in the Modes Palette. Next, click, as shown in Figure 3-72; a new edge loop is added to *Computer table*.

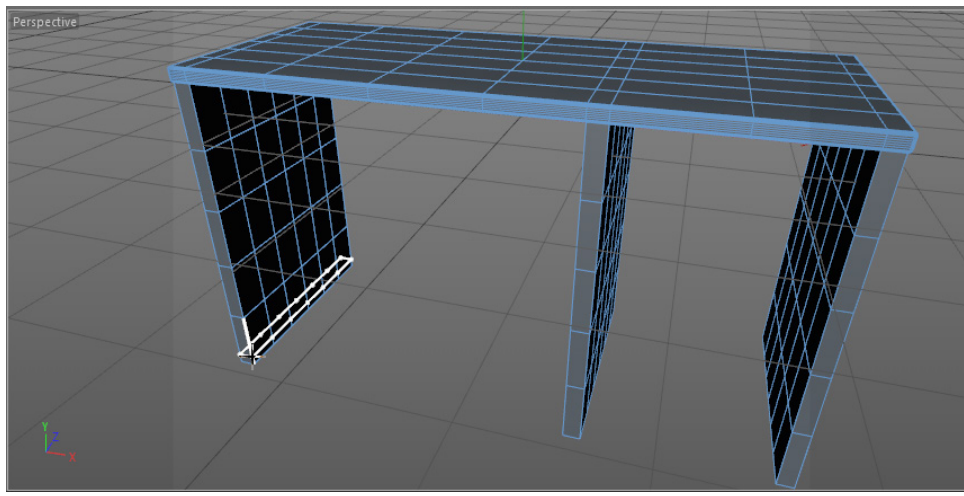

Figure 3-72 *Clicking on edge to create a new edge loop*

3. Choose the **Polygons** tool from the Modes Palette; *Computer table* is displayed in the polygon mode. Choose the **Live Selection** tool from the Command Palette and make sure that the **Only Select Visible Elements** check box is selected. Now, select the polygons of *Computer table*, as shown in Figure 3-73.

4. Right-click in the Perspective viewport; a shortcut menu is displayed. Choose **Extrude** from the shortcut menu; the **Extrude** tool settings are displayed in the Attribute Manager. In the Attribute Manager, choose the **Options** button; the **Options** area is displayed. In this area, set the parameters as follows:

   Offset: **200** Subdivision: **6**

   After entering the values, the selected polygons are extruded in the Perspective viewport, as shown in Figure 3-74.

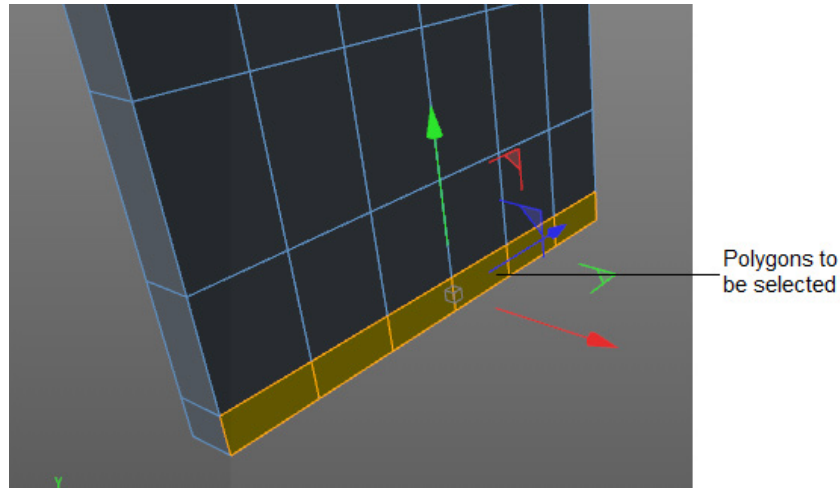

Figure 3-73 *The selected polygons of Computer table*

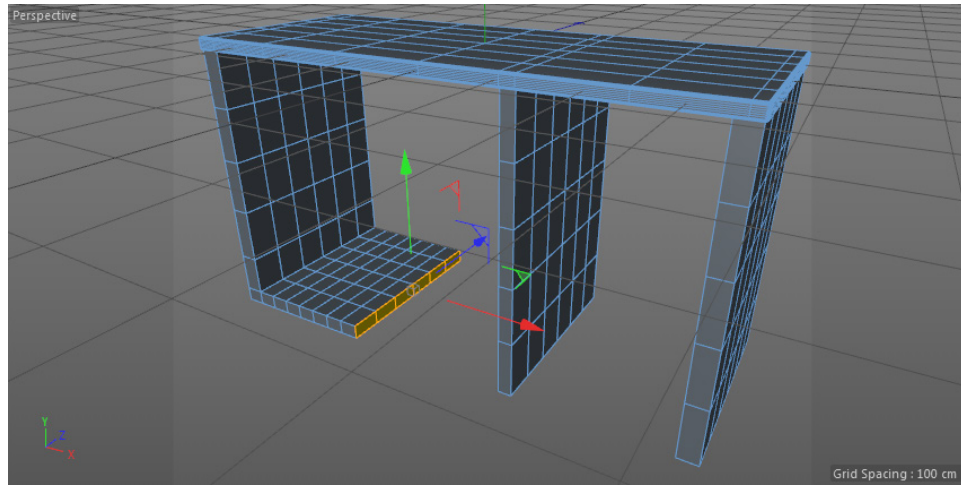

Figure 3-74 *The selected polygons extruded in the Perspective viewport*

5. Choose **Create > Object** from the main menu; a cascading menu is displayed. Next, choose **Cube** from it; the *Cube* object is added to the Object Manager.

6. In the Attribute Manager, choose the **Object** button; the **Object Properties** area is displayed. In this area, set the parameters as follows:

Size . X: **10**	Size . Y: **118**	Size . Z: **291**
Segments X: **4**	Segments Y: **3**	Segments Z: **3**

7. Align *Cube* in the Perspective viewport, as shown in Figure 3-75.

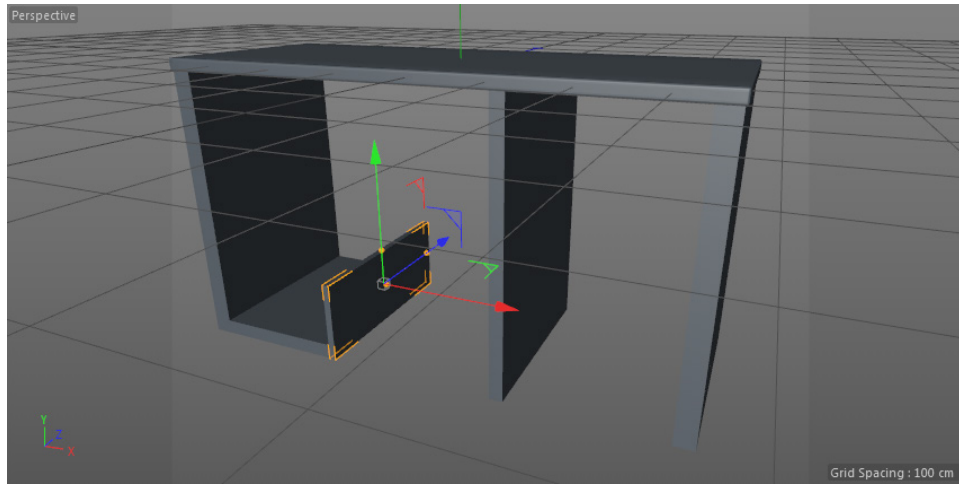

Figure 3-75 *Cube aligned in the Perspective viewport*

Next, you will create design of the side support of *Computer table*.

8. Choose **Create > Object** from the main menu; a cascading menu is displayed. Next, choose **Cube** from it; a cube is created in the Perspective viewport and the *Cube.1* object is added to the Object Manager.

9. In the Attribute Manager, make sure the **Object** button is chosen. In the **Object Properties** area, set the parameters as follows:

   Size . X: **53** Size . Y: **37**
   Segments X: 5 Segments Y: 3 Segments Z: 3

   Select the **Fillet** check box and enter **5** in the **Fillet Radius** spinner.

10. In the Attribute Manager, choose the **Coord** button; the **Coordinates** area is displayed. In this area, set the parameters as follows:

    P . X: **-345.355** P . Y: **-89.77**

    Figure 3-76 displays *Cube.1* positioned in the Perspective viewport.

    Next, you will create a copy of *Cube.1*.

11. Make sure the *Cube.1* object is selected in the Object Manager. Press and hold the left mouse button and the CTRL key and then drag the cursor above *Cube.1* in the Object Manager. Next, release the left mouse button; the *Cube.2* object is added to the Object Manager.

12. Make sure *Cube.2* is selected in the Object Manager. In the Attribute Manager, make sure the **Coord** button is chosen. In the **Coordinates** area, enter **-168.162** in the **P . Y** spinner; the *Cube.2* object is positioned in the Perspective viewport.

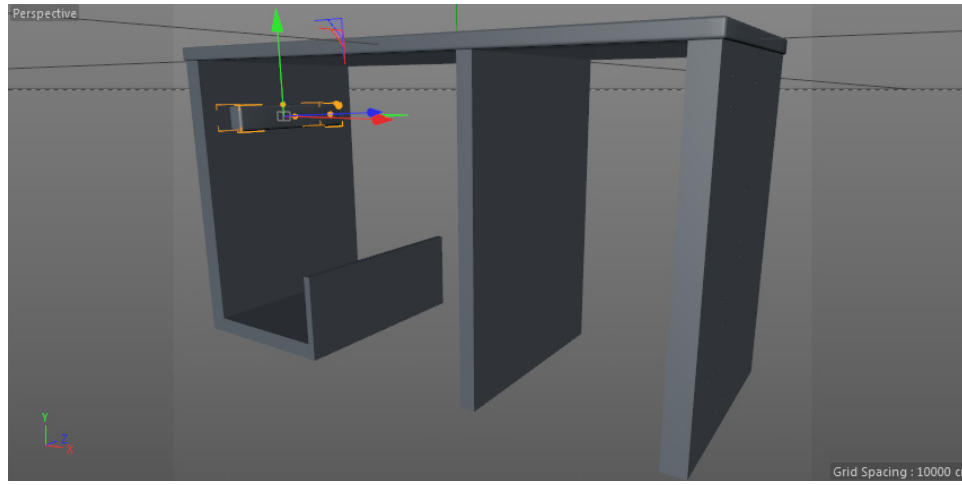

Figure 3-76 *Cube.1 positioned in the Perspective viewport*

13. Make sure the *Cube.2* is selected in the Object Manager. Press and hold the left mouse button and the CTRL key and then drag the cursor above *Cube.2* in the Object Manager. Next, release the left mouse button; the *Cube.3* is added in the Object Manager.

14. Make sure *Cube.3* is selected in the Object Manager. In the Attribute Manager, make sure the **Coord** button is chosen. In the **Coordinates** area, enter **-255.253** in the **P . Y** spinner; the *Cube.3* object is positioned in the Perspective viewport.

15. Select *Cube.1*, *Cube.2,* and *Cube.3* using the CTRL key in the Object Manager. Next, press ALT+G; the *Null* object is added to the Object Manager. Rename it as **left side**. Figure 3-77 displays *left side* positioned in the Perspective viewport.

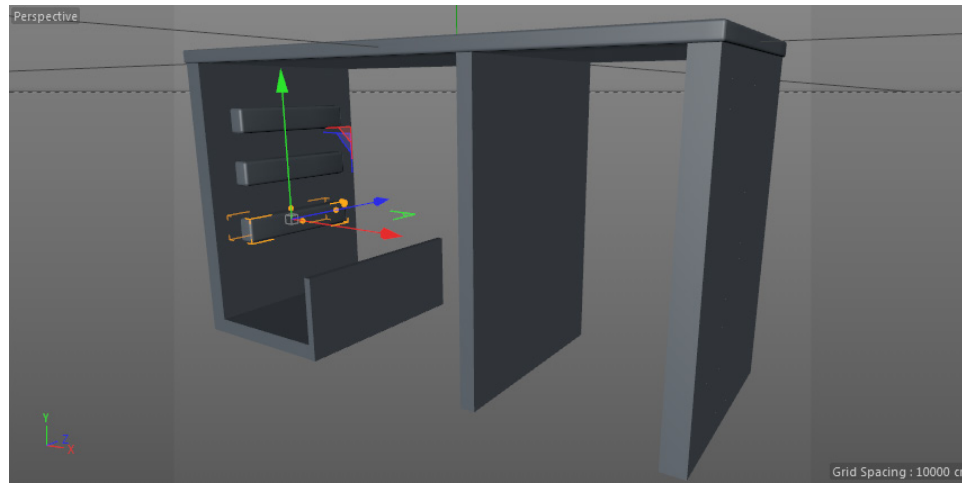

Figure 3-77 *Left side positioned in the Perspective viewport*

16. Choose **Create > Modeling** from the main menu; a cascading menu is displayed. Next, choose **Boole** from it; the *Boole* object is added to the Object Manager.

17. In the Object Manager, press and hold the left mouse button on *left side* and drag it on *Boole*. Now, release the left mouse button; the *left side* is connected to *Boole* in the Object Manager.

18. In the Object Manager, press and hold the left mouse button on *Computer table* and drag it on *Boole*; the *Computer table* is connected to *Boole* in the Object Manager, as shown in Figure 3-78 and holes are created in *Computer table*, as shown in Figure 3-79.

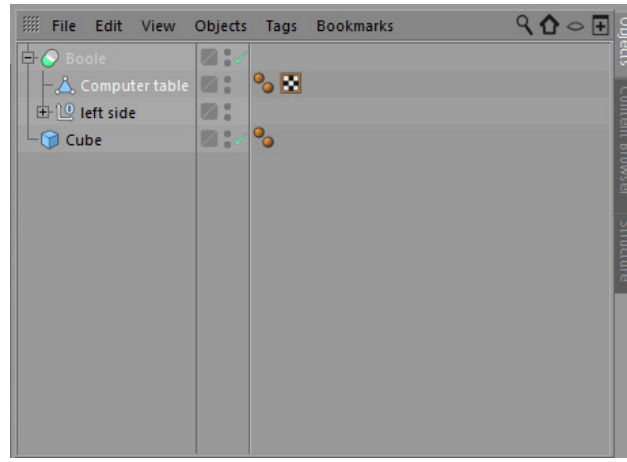

Figure 3-78 *Boole connected to Computer table*

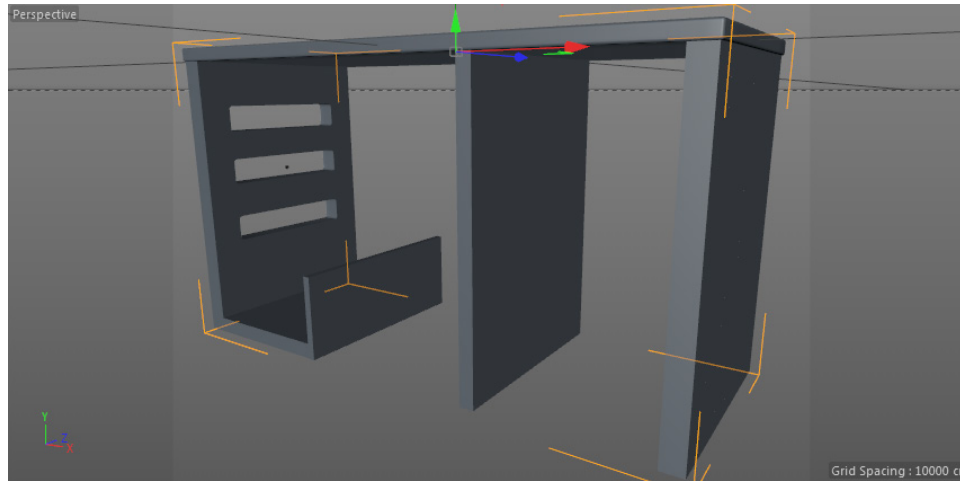

Figure 3-79 *The holes created in the side support of the Computer table*

Creating the Support for the Keyboard

In this section, you will create support for the keyboard.

1. Press F4; the Front viewport is maximized. Choose the **Edges** tool from the Modes Palette; *Computer table* is displayed in the edges mode.

2. Right-click in the Front viewport; a shortcut menu is displayed. Choose **Plane Cut** from the shortcut menu; the **Plane Cut** tool settings are displayed in the Attribute Manager. In the Front viewport, drag the cursor to create a cut, refer to Figure 3-80.

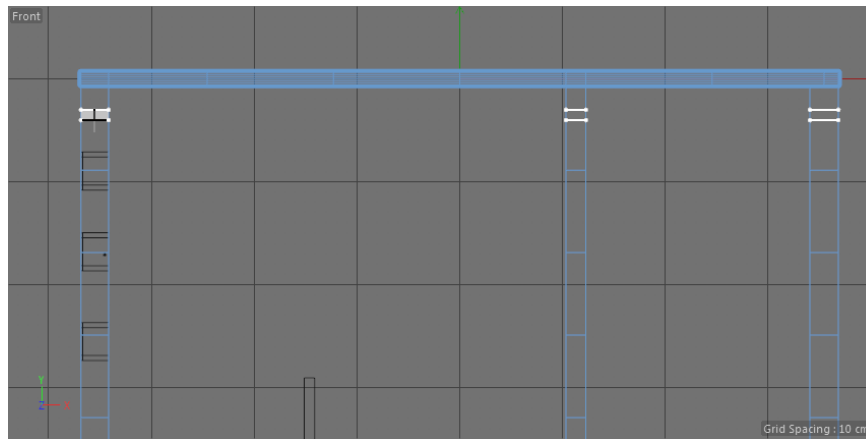

Figure 3-80 *Creating an edge using the* ***Plane Cut*** *tool*

3. Click and drag again to create second cut below the first cut that you created earlier, refer to Figure 3-80; two new edge loops are added to *Computer table*. Similarly, create two more cuts using the **Plane Cut** tool. Figure 3-81 displays four new edge loops added to the *Computer table*.

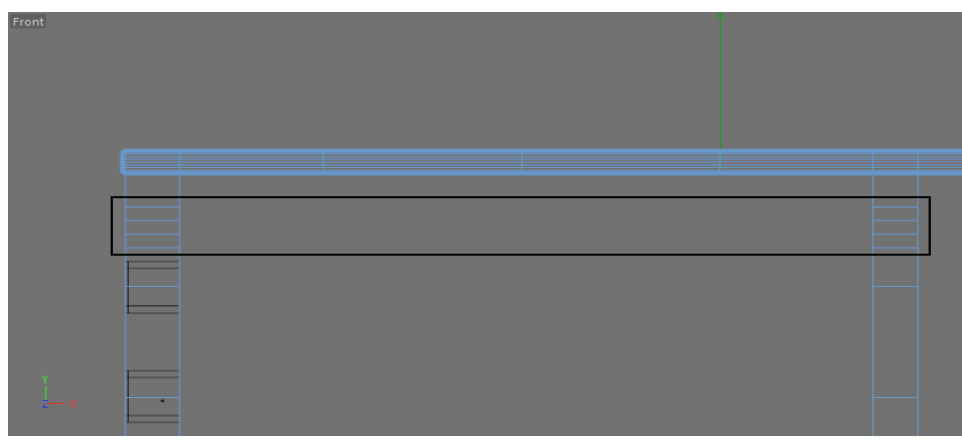

Figure 3-81 *Four new edge loops added to the Computer table*

4. Press F1; the Perspective viewport is maximized. Choose the **Polygons** tool from the Modes Palette; *Computer table* is displayed in the polygon mode. Choose the **Live Selection** tool from the Command Palette and make sure that the **Only Select Visible Elements** check box is selected. Now, select the polygons of both sides of *Computer table*, as shown in Figure 3-82.

5. Right-click in the Perspective viewport; a shortcut menu is displayed. Choose **Extrude** from the shortcut menu; the **Extrude** tool settings are displayed in the Attribute Manager. In the

Attribute Manager, choose the **Options** button; the **Options** area is displayed. In this area, set the value **30** in the **Offset** slider and then press the ENTER key.

Figure 3-83 displays the selected polygons extruded in the Perspective viewport.

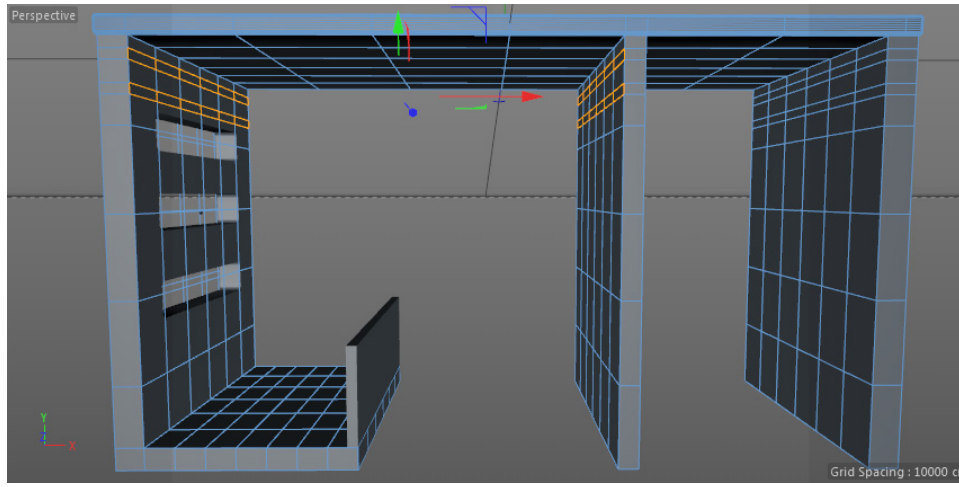

Figure 3-82 *The selected polygons of Computer table*

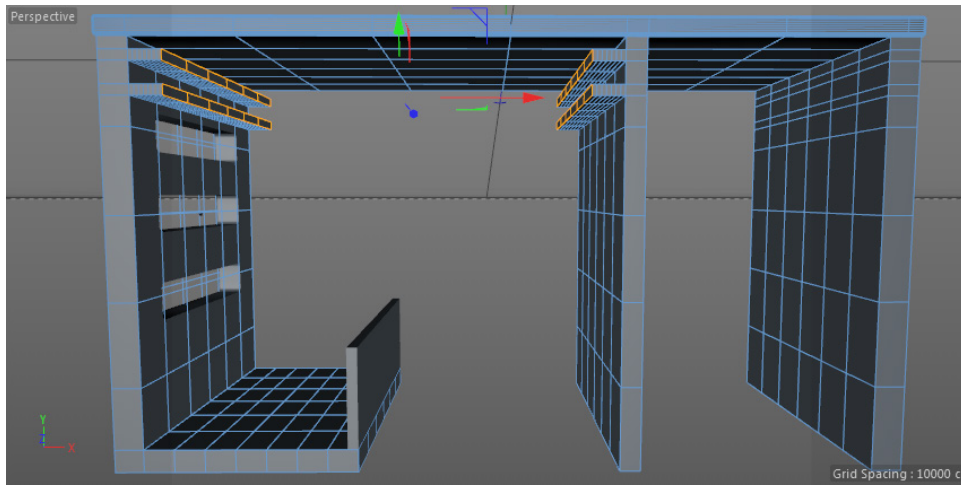

Figure 3-83 *The selected polygons extruded in the Perspective viewport*

6. Press F2; the Top viewport is maximized. Choose **Create > Object** from the main menu; a cascading menu is displayed. Next, choose **Cube** from it; a cube is created in the Top viewport and the *Cube.1* object is added to the Object Manager.

7. In the Attribute Manager, choose the **Basic** button; the **Basic Properties** area is displayed. In this area, enter **Keyboard support** in the **Name** text box; *Cube* is renamed as *Keyboard support* in the Object Manager.

8. Make sure *Keyboard support* is selected in the Object Manager. In the Attribute Manager, choose the **Object** button; the **Object Properties** area is displayed. In the **Object Properties** area, set the parameters as follows:

Size . X: **429.61** Size . Y: **10** Size . Z: **284**
Segments X: **6** Segments Y: **2** Segments Z: **6**

Select the **Fillet** check box and enter **3** in the **Fillet Radius** spinner.

9. In the Attribute Manager, choose the **Coord** button; the **Coordinates** area is displayed. In this area, set the parameters as follows:

P . X: **-123.684** P . Y: **-44.68** P . Z: **0**

Press F1; the Perspective viewport is maximized. Figure 3-84 displays *Keyboard support* in the Perspective viewport.

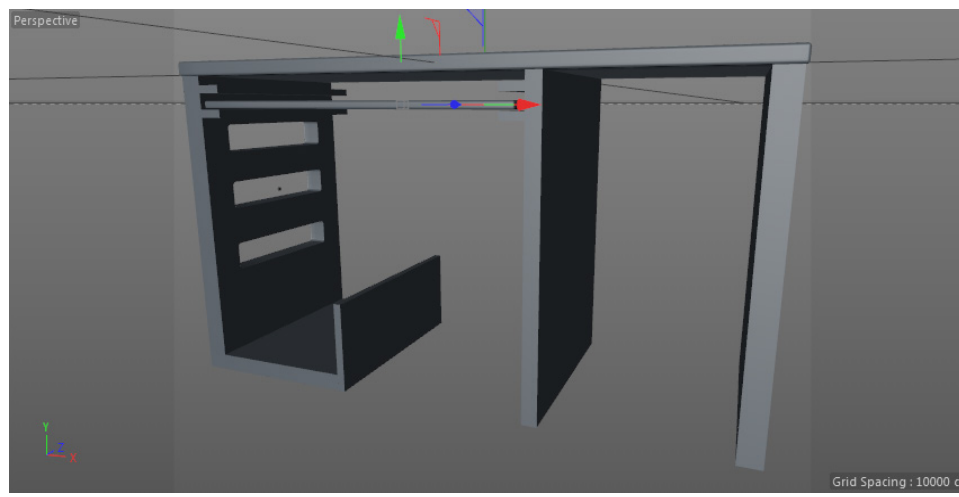

Figure 3-84 *The Keyboard support of Computer table*

Creating the Base for the Monitor

In this section, you will create the base for the monitor.

1. Make sure *Computer table* is selected in the Object Manager. Choose the **Edges** tool from the Modes Palette; the *Computer table* is displayed in the edges mode.

2. Right-click in the Perspective viewport; a shortcut menu is displayed. Choose **Loop/Path Cut** from the shortcut menu; the **Loop/Path Cut** tool settings are displayed in the Attribute Manager.

3. Make sure the **Enable Snap** tool is not chosen in the Modes Palette. Next, click to create a new edge loop, refer to Figure 3-85. Again, create one more edge loop using the **Loop/Path Cut** tool, as shown in Figure 3-86.

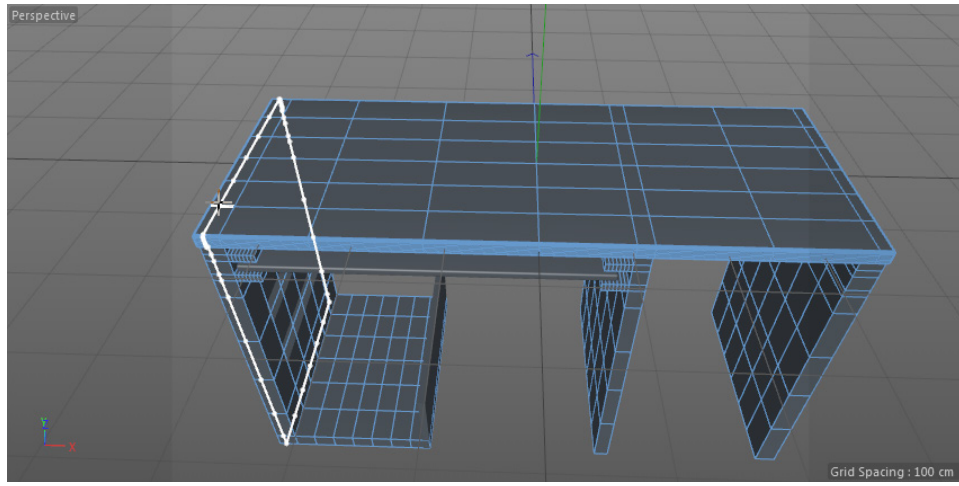

Figure 3-85 *New edge loop created*

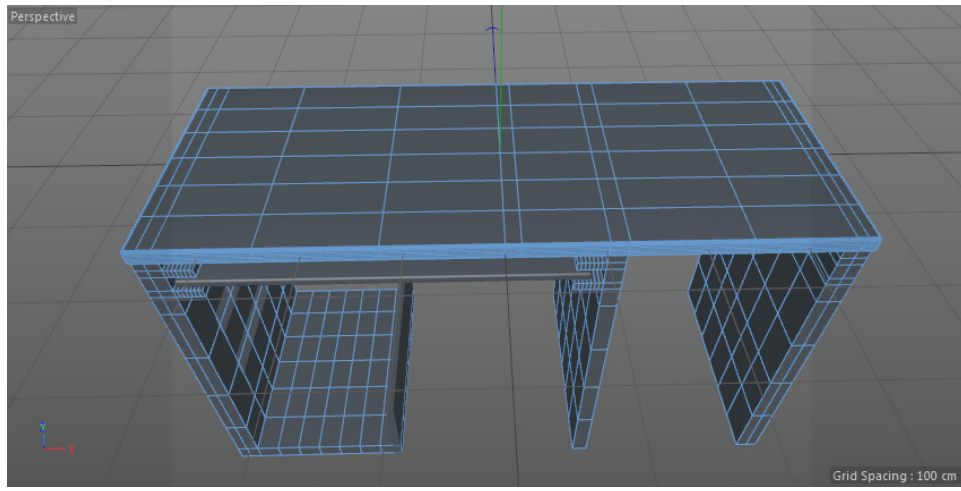

Figure 3-86 *Another edge loop added to Computer table*

4. Choose the **Polygons** tool from the Modes Palette; the *Computer table* is displayed in the polygon mode. Choose the **Live Selection** tool from the Command Palette and make sure that the **Only Select Visible Elements** check box is selected. Now, select the polygons of *Computer table*, as shown in Figure 3-87.

5. Right-click in the Perspective viewport; a shortcut menu is displayed. Choose **Extrude** from the shortcut menu; the **Extrude** tool settings are displayed in the Attribute Manager. In the Attribute Manager, make sure the **Options** button is chosen. In the **Options** area, set the parameters as follows:

   Offset: **40** Subdivision: **4**

   Figure 3-88 displays the selected polygons extruded in the Perspective viewport.

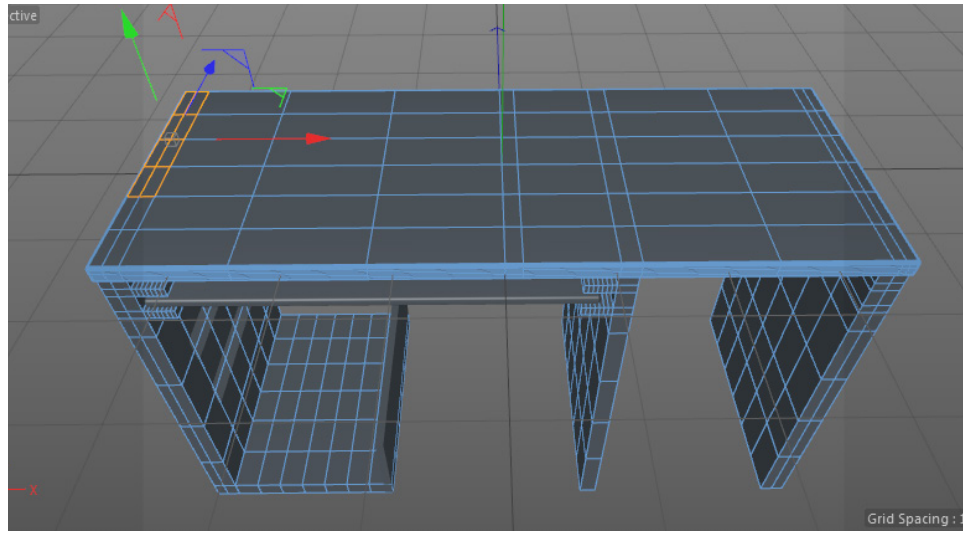

Figure 3-87 *The selected polygons of Computer table*

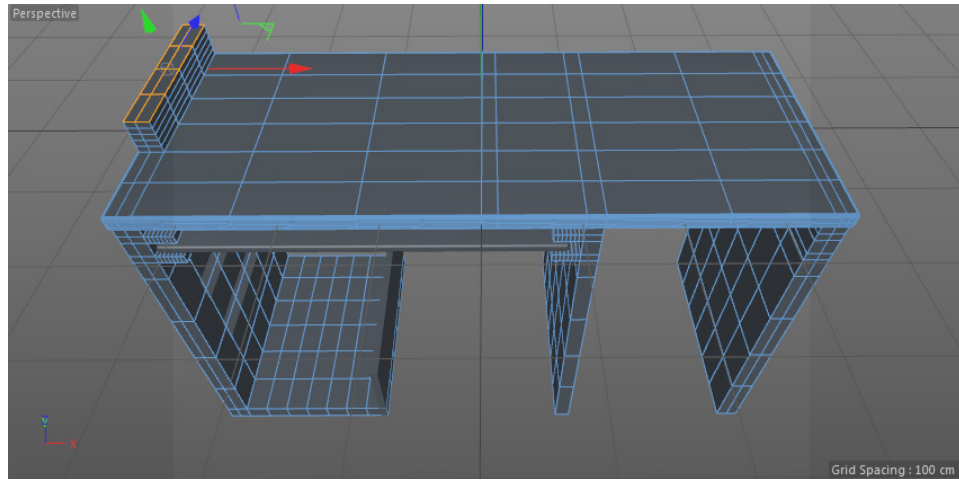

Figure 3-88 *The selected polygons extruded in the Perspective viewport*

6. Choose the **Live Selection** tool from the Command Palette and make sure that the **Only Select Visible Elements** check box is selected. Now, select the polygons of *Computer table*, as shown in Figure 3-89.

7. Right-click in the Perspective viewport; a shortcut menu is displayed. Choose **Extrude** from the shortcut menu; the **Extrude** tool settings are displayed in the Attribute Manager. In the Attribute Manager, choose the **Options** button; the **Options** area is displayed. In this area, set the parameters as follows:

Offset: **345** Subdivision: **8**

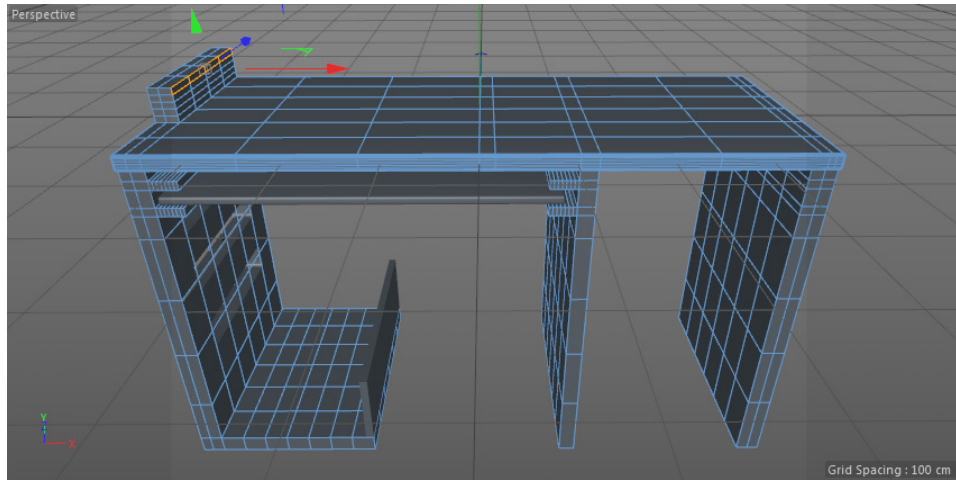

Figure 3-89 *The selected polygons of Computer table*

Figure 3-90 displays the selected polygons extruded in the Perspective viewport.

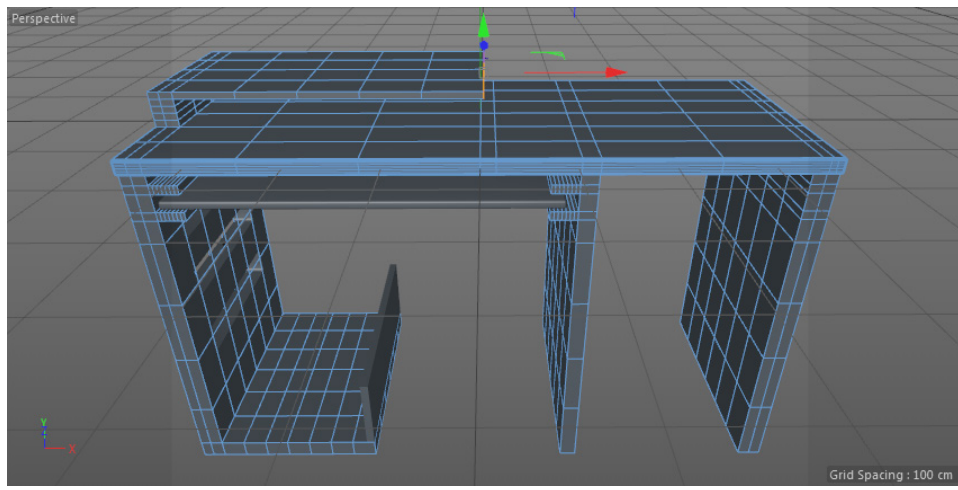

Figure 3-90 *The selected polygons extruded in the Perspective viewport*

Creating the Top Shelves of the Computer Table

In this section, you will create the top shelves of the computer table.

1. Make sure the polygon mode is activated. Choose the **Live Selection** tool from the Command Palette and make sure that the **Only Select Visible Elements** check box is selected. Now, select the polygons of *Computer table*, as shown in Figure 3-91.

2. Right-click in the Perspective viewport; a shortcut menu is displayed. Choose **Extrude** from the shortcut menu; the **Extrude** tool settings are displayed in the Attribute Manager. In the Attribute Manager, make sure the **Options** button is chosen. In the **Options** area, enter the value **160** in the **Offset** spinner and then press ENTER.

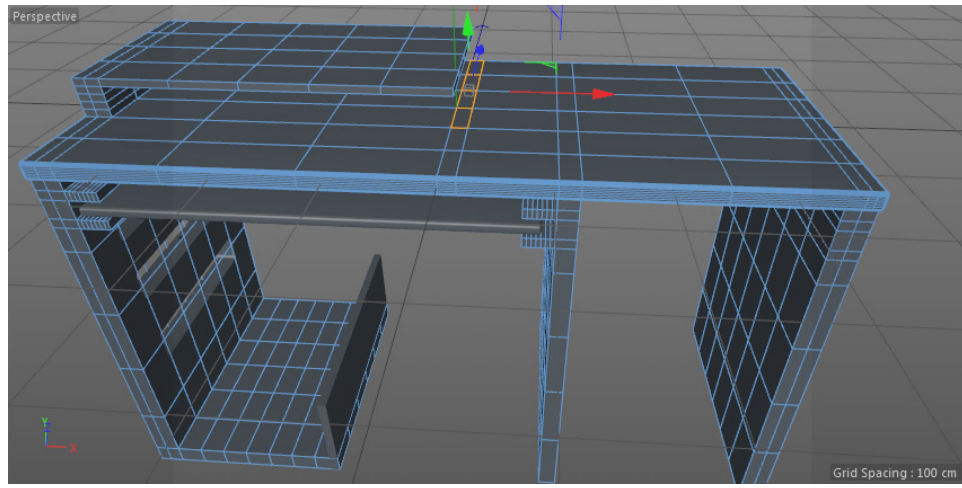

Figure 3-91 *The selected polygons of Computer table*

Figure 3-92 displays the selected polygons extruded in the Perspective viewport.

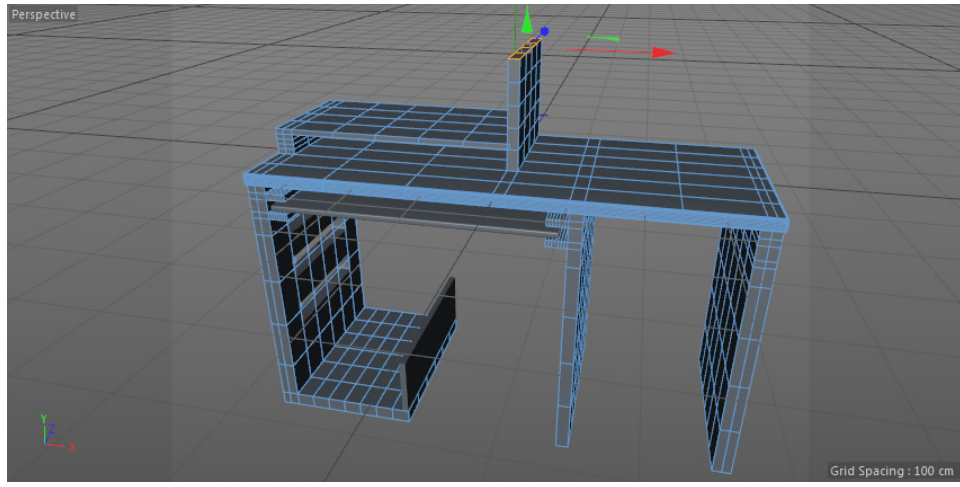

Figure 3-92 *The selected polygons extruded in the Perspective viewport*

3. Choose the **Edges** tool from the Modes Palette; *Computer table* is displayed in the edges mode.

4. Right-click in the Perspective viewport; a shortcut menu is displayed. Choose **Loop/Path Cut** from the shortcut menu; the **Loop/Path Cut** tool settings are displayed in the Attribute Manager.

5. Make sure the **Enable Snap** tool is deactivated in the Modes Palette. Next, click on the edge, refer to Figure 3-93; a new edge loop is added to *Computer table*. Again, create an edge loop using the **Loop/Path Cut** tool, refer to Figure 3-94.

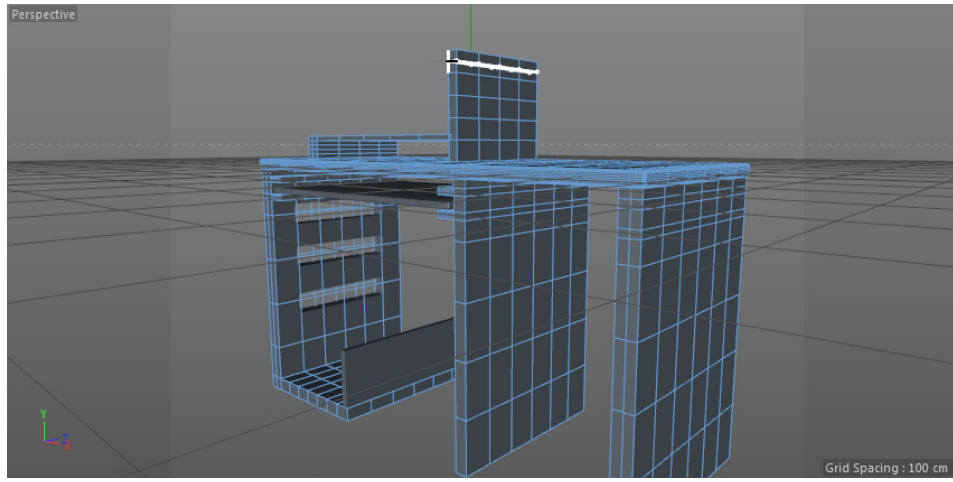

Figure 3-93 *Clicking on edge to create a new edge loop*

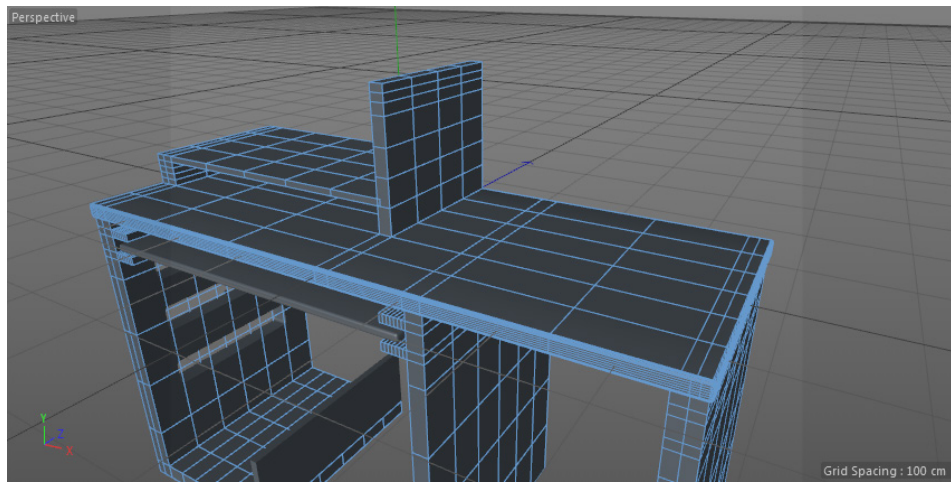

Figure 3-94 *Two new edge loops added to the Computer table*

6. Choose the **Polygons** tool from the Modes Palette; the Computer table is displayed in the polygon mode. Choose the **Live Selection** tool from the Command Palette and make sure that the **Only Select Visible Elements** check box is selected. Now, select the polygons of Computer table, as shown in Figure 3-95.

7. Right-click in the Perspective viewport; a shortcut menu is displayed. Choose **Extrude** from the shortcut menu; the **Extrude** tool settings are displayed in the Attribute Manager. Make sure the **Options** button is chosen in this manager. In the **Options** area, set the parameters as follows:

Offset: **335** Subdivision: **12**

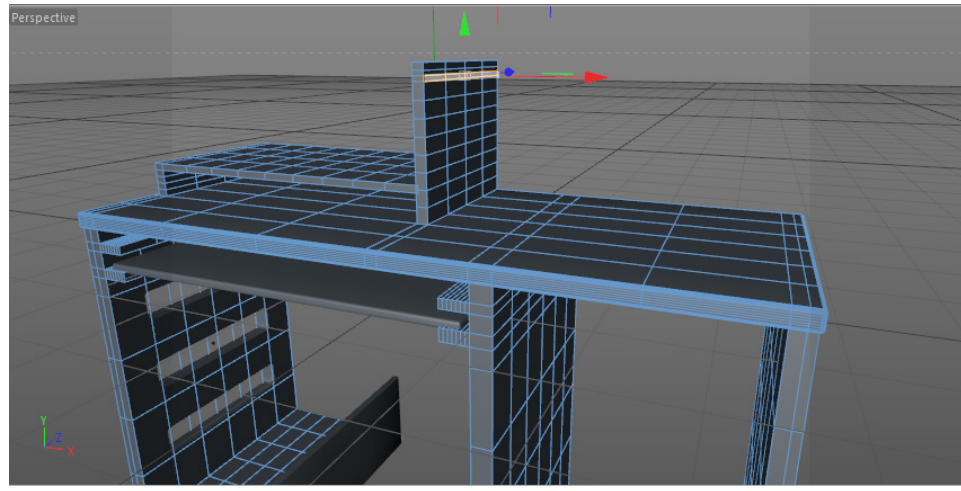

Figure 3-95 *The selected polygons of Computer table*

Figure 3-96 displays the selected polygons extruded in the Perspective viewport.

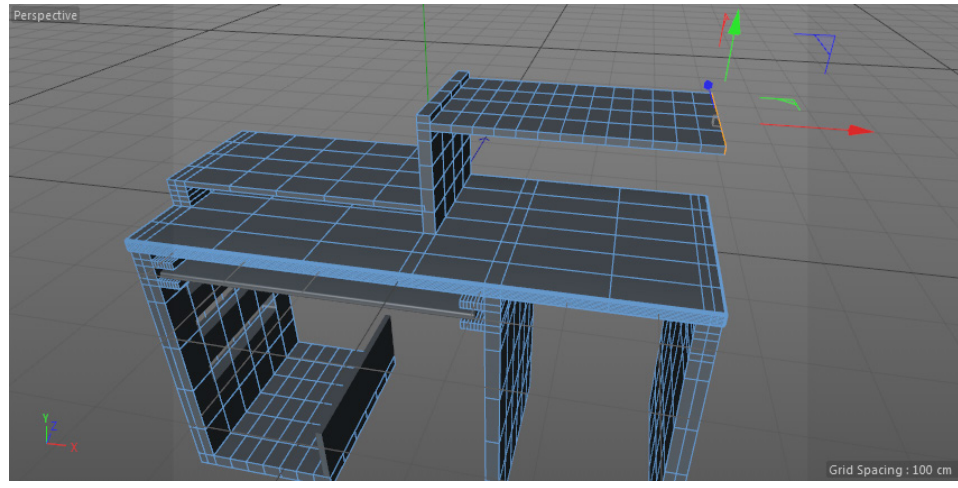

Figure 3-96 *The selected polygons extruded in the Perspective viewport*

8. Make sure the polygon mode is activated. Choose the **Live Selection** tool from the Command Palette and make sure that the **Only Select Visible Elements** check box is selected. Now, select the four polygons of *Computer table*, as shown in Figure 3-97.

9. Right-click in the Perspective viewport; a shortcut menu is displayed. Choose **Extrude** from the shortcut menu; the **Extrude** tool settings are displayed in the Attribute Manager. Choose the **Options** button in this manager; the **Options** area is displayed. In this area, enter **160** in the **Offset** spinner.

Figure 3-98 displays the selected polygons extruded in the Perspective viewport.

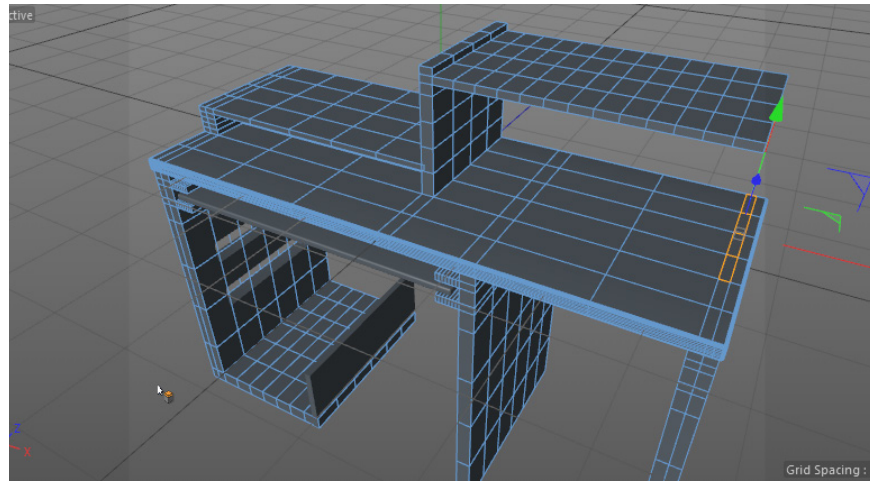

Figure 3-97 *The selected polygons of Computer table*

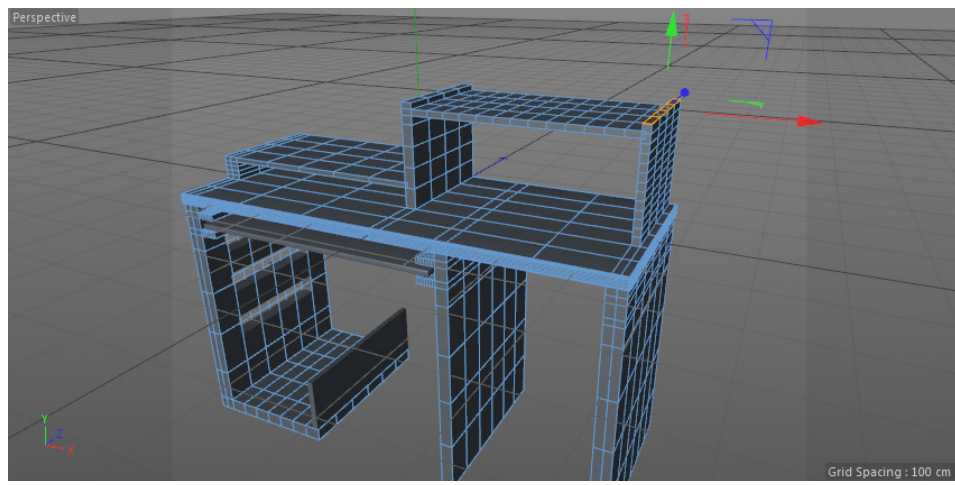

Figure 3-98 *The selected polygons extruded in the Perspective viewport*

10. Choose the **Edges** tool from the Modes Palette; the *Computer table* is displayed in the edges mode.

11. Right-click in the Perspective viewport; a shortcut menu is displayed. Choose **Loop/Path Cut** from the shortcut menu; the **Loop/Path Cut** tool settings are displayed in the Attribute Manager. Make sure **Loop** is selected in the **Mode** drop-down list and then clear the **Restrict to Selection** check box.

12. Make sure the **Enable Snap** tool is deactivated in the Modes Palette. Next, click to create an edge loop, refer to Figure 3-99; a new edge loop is added to *Computer table*. Again, create an edge loop using the **Loop/Path Cut** tool, refer to Figure 3-100.

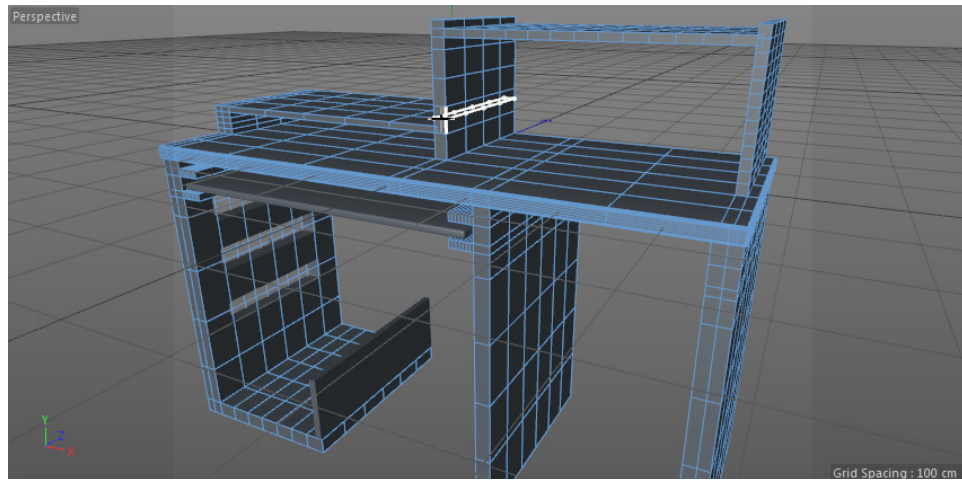

Figure 3-99 *Clicking on edge to create a new edge loop*

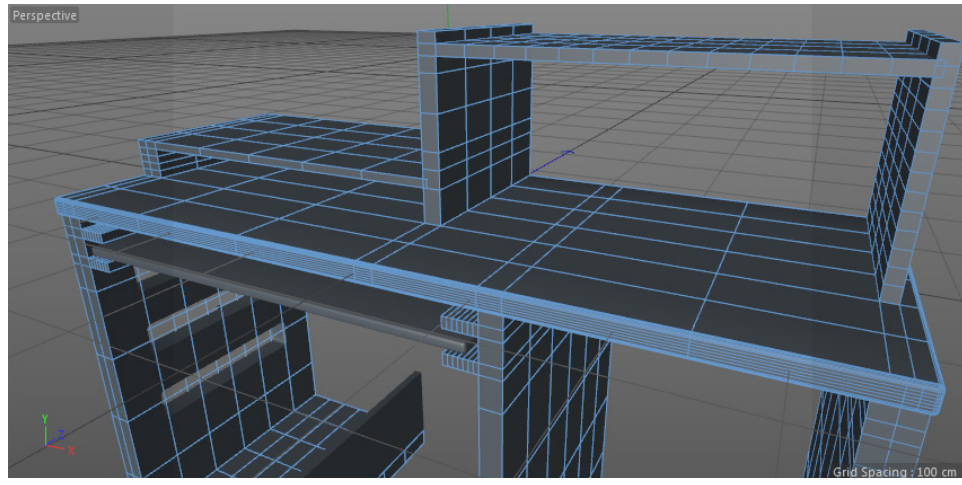

Figure 3-100 *The new edge loop added to the Computer table*

13. Make sure the polygon mode is activated. Choose the **Live Selection** tool from the Command Palette and make sure that the **Only Select Visible Elements** check box is selected. Now, select the polygons of *Computer table*, as shown in Figure 3-101.

14. Right-click in the Perspective viewport; a shortcut menu is displayed. Choose **Extrude** from the shortcut menu; the **Extrude** tool settings are displayed in the Attribute Manager. Choose the **Options** button in this manager; the **Options** area is displayed. In this area, enter **335** in the **Offset** spinner.

    Figure 3-102 displays the selected polygons extruded in the Perspective viewport.

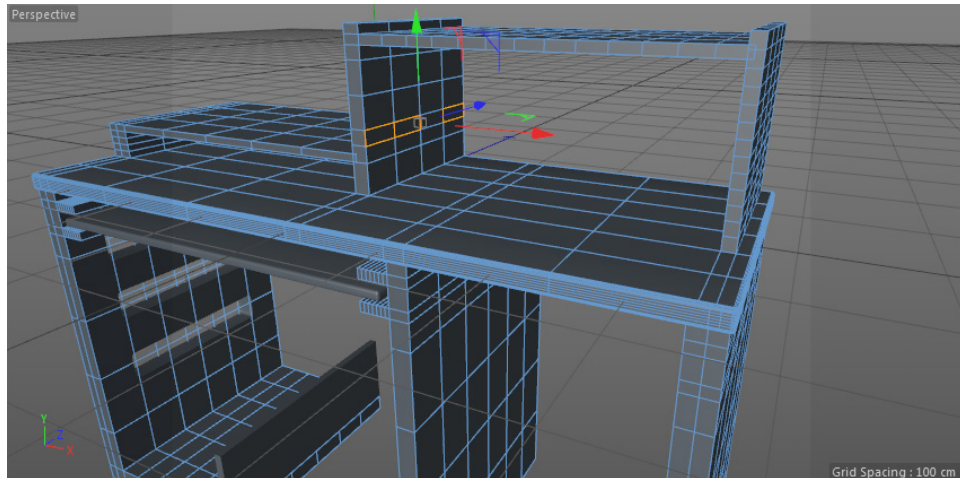

Figure 3-101 *The selected polygons of Computer table*

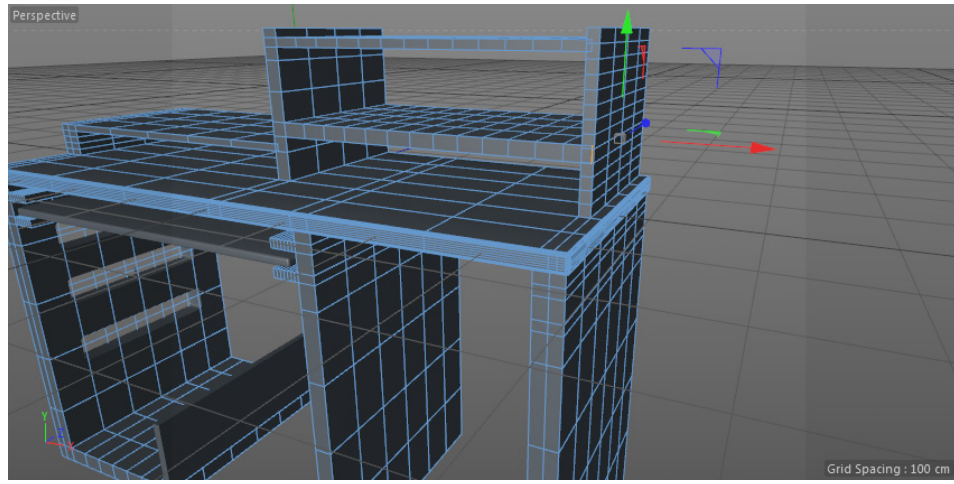

Figure 3-102 *The selected polygons extruded in the Perspective viewport*

Creating the Bottom Shelf of the Computer Table

In this section, you will create the bottom shelf of *Computer table*.

1. Choose **Create > Object** from the main menu; a cascading menu is displayed. Next, choose **Cube** from it; a cube is created in the Perspective viewport and *Cube* is added to the Object Manager.

2. In the Attribute Manager, choose the **Basic** button; the **Basic Properties** area is displayed. In this area, enter **Shelf1** in the **Name** text box; *Cube* is renamed as *Shelf1* in the Object Manager.

3. In the Attribute Manager, choose the **Object** button; the **Object Properties** area is displayed. In this area, set the parameters as follows:

Size . X: **254.61** Size . Y: **15** Size . Z: **280**
Segments X: **6** Segments Y: **4** Segments Z: **6**

Select the **Fillet** check box and enter **3** in the **Fillet Radius** spinner.

4. In the Attribute Manager, choose the **Coord** button; the **Coordinates** area is displayed. In this area, set the parameters as follows:

P . X: **234.854** P . Y: **-119.37** P . Z: **0**

Figure 3-103 displays *Shelf1* positioned in the Perspective viewport.

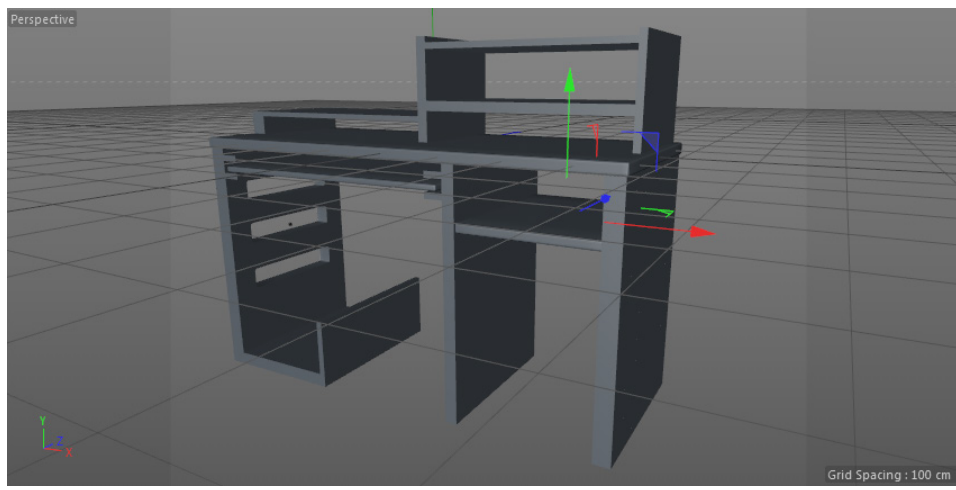

Figure 3-103 *Shelf1 positioned in the Perspective viewport*

5. Make sure the *Shelf1* is selected in the Object Manager. Press and hold the left mouse button and the CTRL key and then drag the cursor above *Shelf1* in the Object Manager. Next, release the left mouse button; the *Shelf1.1* object is added in the Object Manager.

6. Make sure the *Shelf1.1* object is selected in the Object Manager. In the Attribute Manager, make sure the **Coord** button is chosen. In the **Coordinates** area, enter **-291.892** in the **P . Y** spinner; the *Shelf1.1* object is positioned in the Perspective viewport, as shown in Figure 3-104.

Creating the Magazine Stand

In this section, you will create the magazine stand of Computer table by using the **Polygon Pen** tool.

1. Select the **Model** option from the **Layout** drop-down list located at the upper right corner of the interface; the Modeling Tool Palette is displayed at the lower portion of the interface, refer to Figure 3-105.

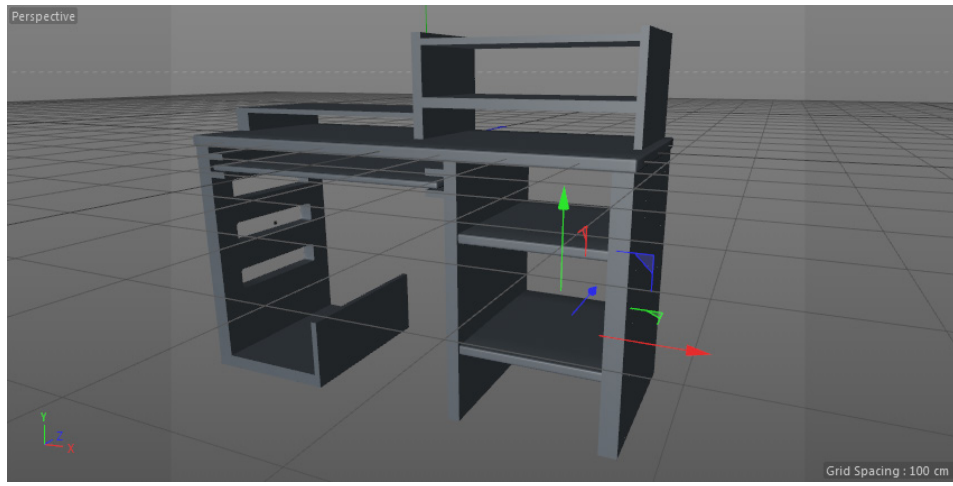

Figure 3-104 *Shelf1.1 positioned in the Perspective viewport*

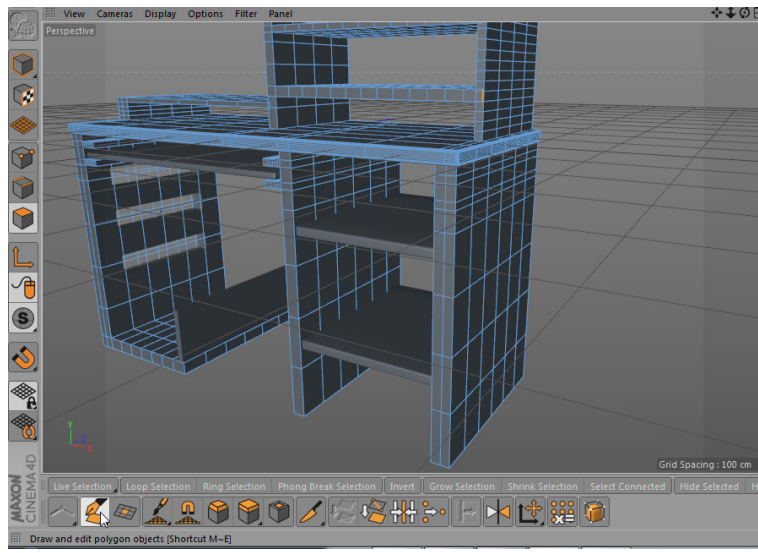

Figure 3-105 *Choosing the* ***Polygon Pen*** *tool from the Modeling Tool Palette*

2. Choose the **Polygon Pen** tool from the Modeling Tool Palette and then hover the cursor on the polygon of the *Computer table*, as shown in Figure 3-106; the highlighted polygon is displayed in the Perspective viewport.

3. Hold the CTRL key and drag the highlighted polygon, as shown in Figure 3-107.

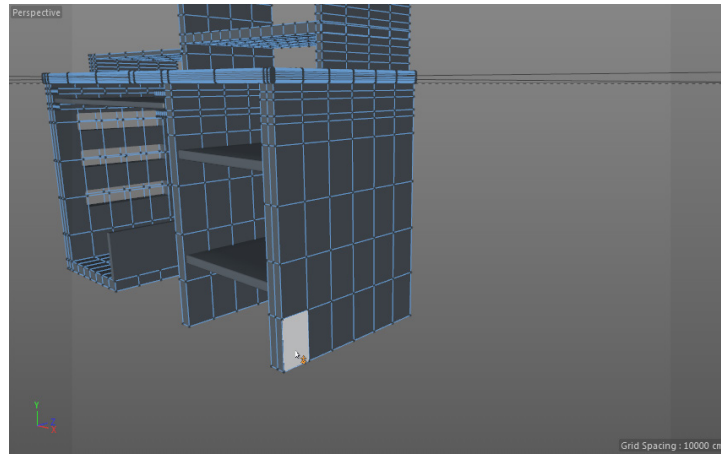

Figure 3-106 *The highlighted polygon*

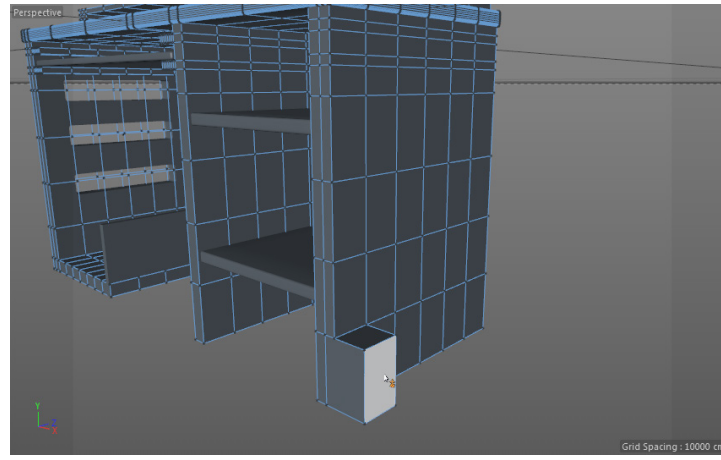

Figure 3-107 *Dragging the highlighted polygon*

4. Hover the cursor on the top polygon; the polygon is highlighted, as shown in Figure 3-108. Next, hold the CTRL key and drag the highlighted polygon, as shown in Figure 3-109.

5. Rotate the viewport using the ALT key and then hover the cursor on the polygon; the polygon is highlighted, as shown in Figure 3-110. Next, hold the CTRL key and drag the highlighted polygon, as shown in Figure 3-111.

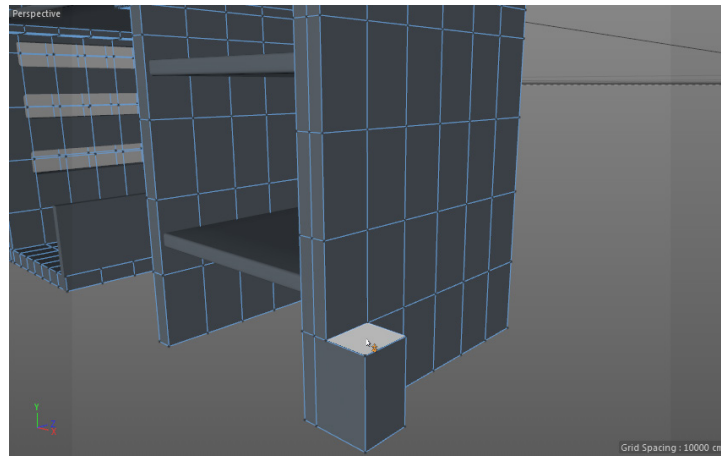

Figure 3-108 *The highlighted polygon of magazine stand*

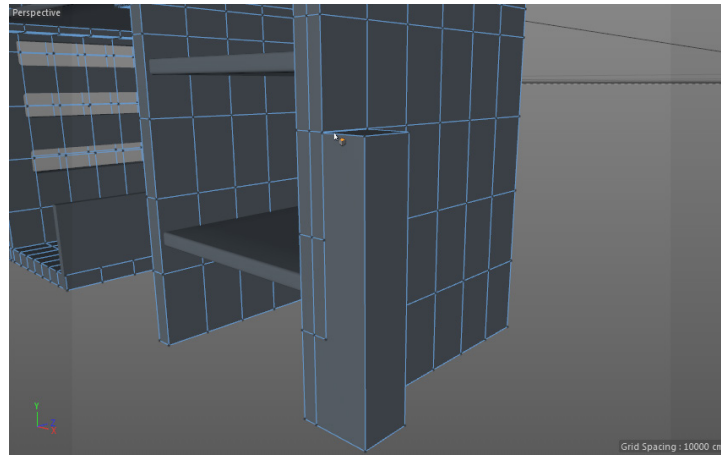

Figure 3-109 *Dragging the highlighted polygon*

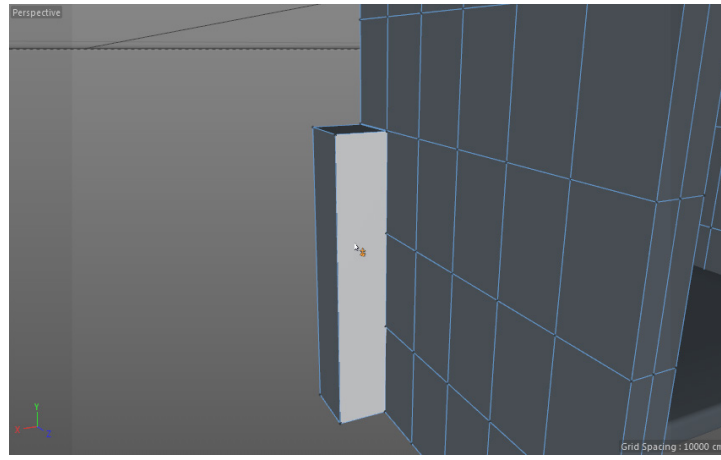

Figure 3-110 *Highlighted polygon*

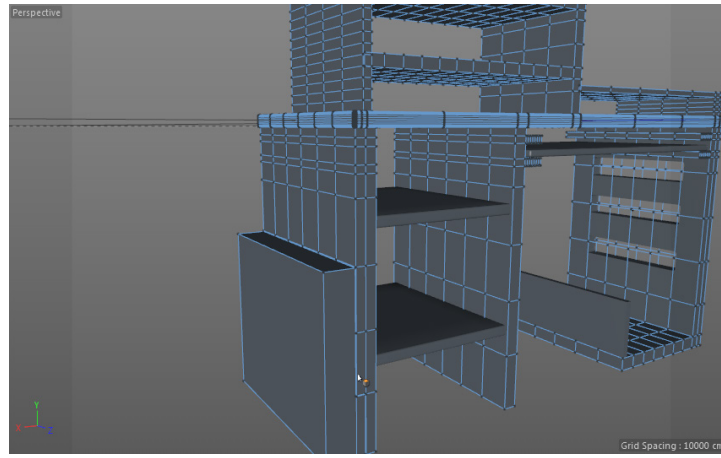

Figure 3-111 *Dragging the highlighted polygon*

Next, you will create the edges on the magazine stand surface.

6. Choose the **Edges** tool in the Mode palette and make sure the **Polygon Pen** tool is chosen in the Modeling Tool Palette. Next, click on an edge, as shown in Figure 3-112 and then click again on another edge; a new edge is created, as shown in Figure 3-113. Similarly, create two more edges, refer to Figure 3-114.

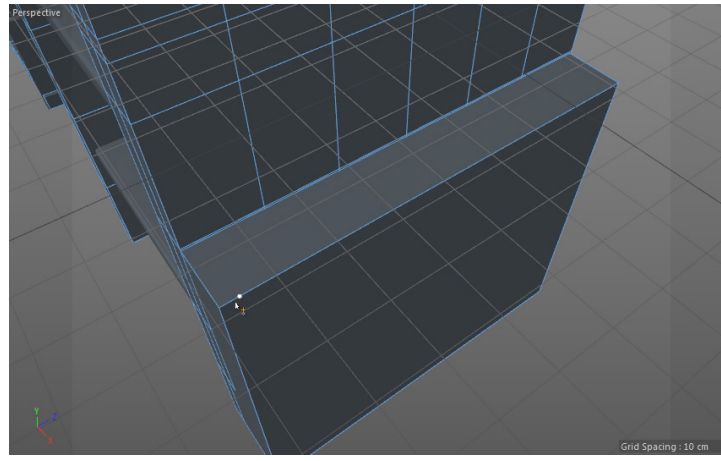

Figure 3-112 *Clicking on an edge*

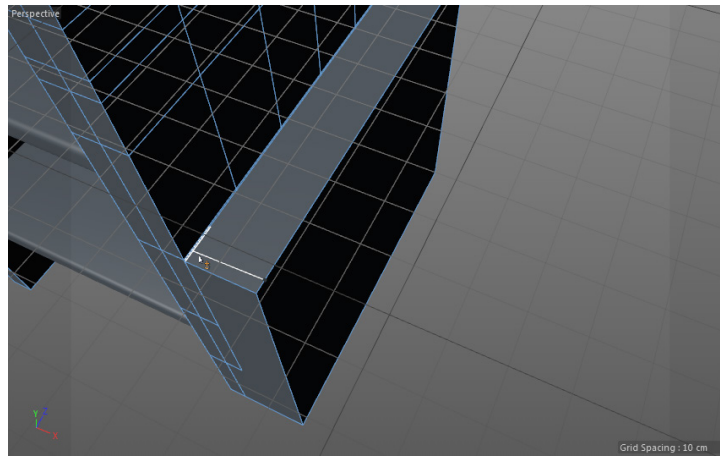

Figure 3-113 *Clicking on second edge to create a new edge*

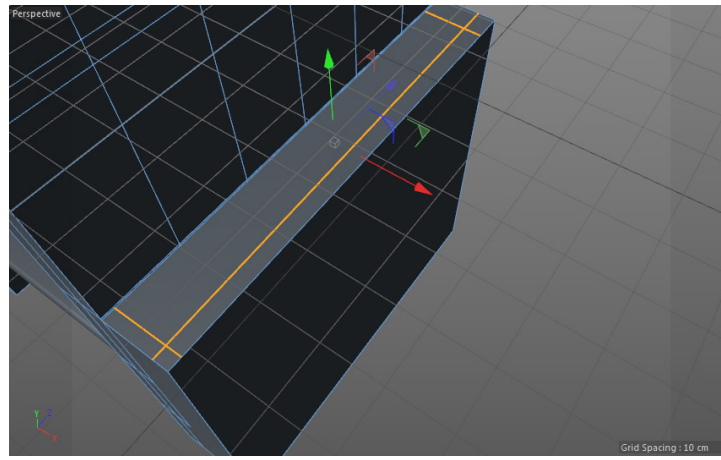

Figure 3-114 *Three new edges added to the magazine stand*

7. Hover the cursor on the polygon; the polygon is highlighted, as shown in Figure 3-115. Next, hold the CTRL key and drag the highlighted polygon downward, as shown in Figure 3-116.

   Next, you will create a design on the magazine support.

8. Choose the **Edges** tool in the Mode palette. Make sure the **Polygon Pen** tool is chosen in the Modeling Tool Palette. Next, click on the bottom-left point, as shown in Figure 3-117 and then click on the top-right corner point; a new edge is created, as shown in Figure 3-118.

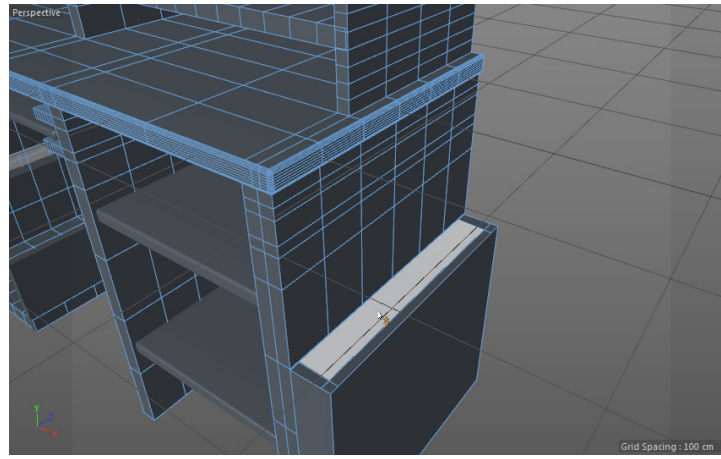

Figure 3-115 *Highlighted polygon*

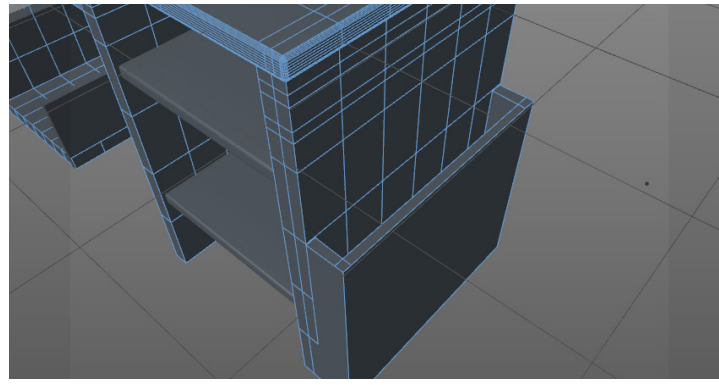

Figure 3-116 *Dragging the highlighted polygon downward*

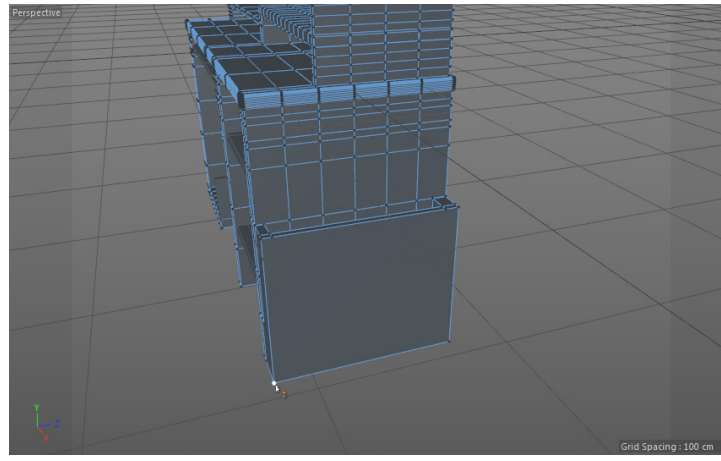

Figure 3-117 *Clicking on the corner point*

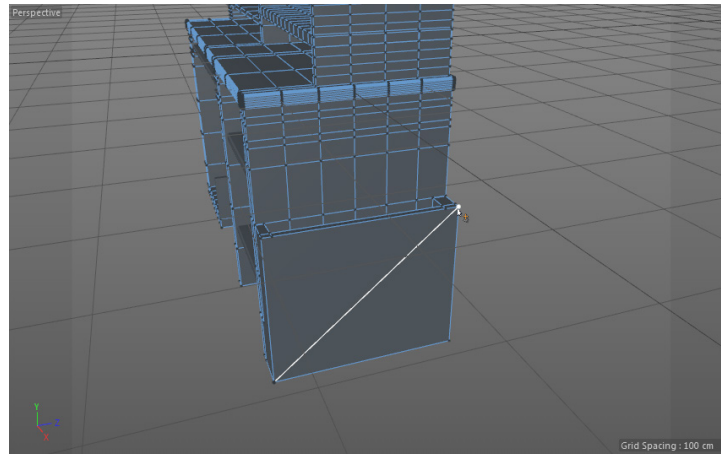

Figure 3-118 *The new edge created*

9. Hover the cursor over the created edge. Press and hold the CTRL+SHIFT keys and then drag [do not click, just drag]; the shape of the edge is changed to an arc shape, refer to Figure 3-119.

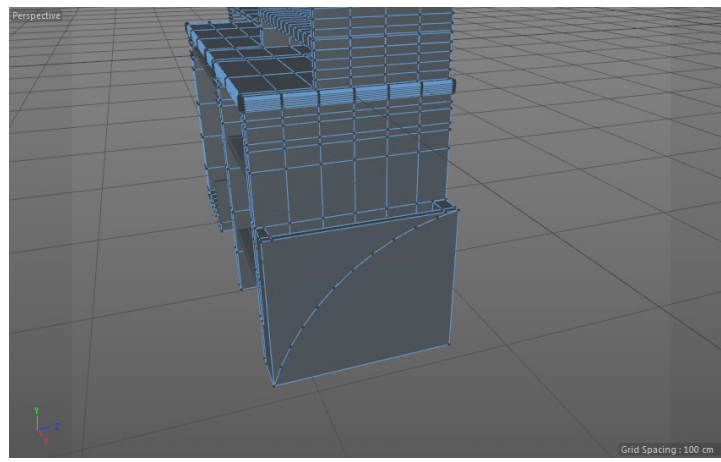

Figure 3-119 *The edge converted to an arc shape*

10. Hover the cursor on the polygon; the polygon is highlighted, as shown in Figure 3-120. Next, hold the CTRL key and drag the highlighted polygon; the selected polygon is extruded, as shown in Figure 3-121.

Changing the Background Color of the Scene

To change the background color of the scene to white in the final output, follow the steps given in Tutorial 1 of Chapter 2.

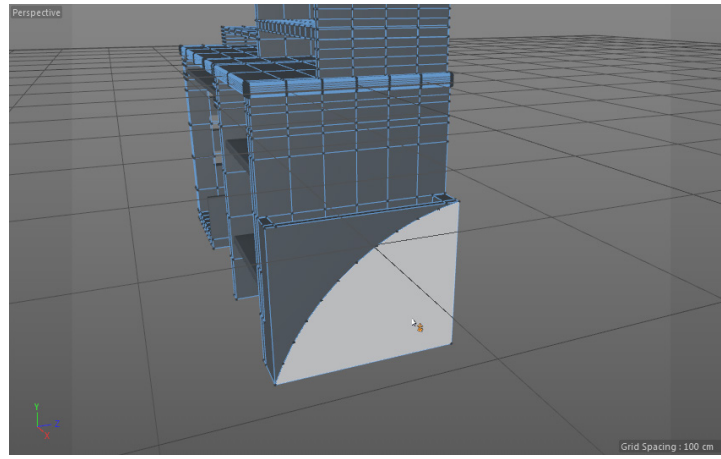

Figure 3-120 *Highlighted polygon*

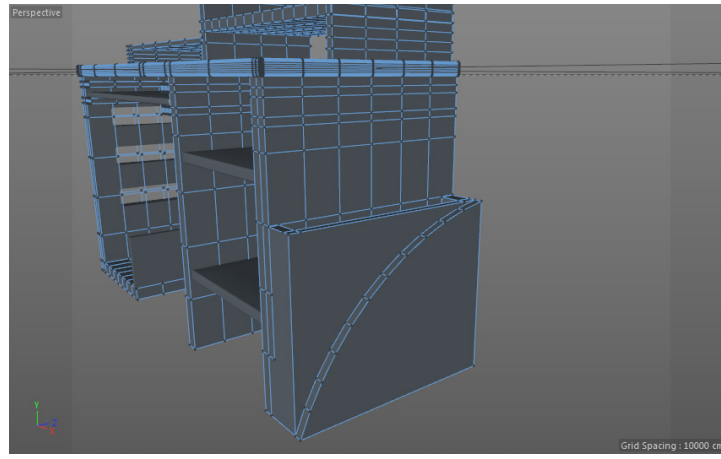

Figure 3-121 *The extruded polygon*

Saving and Rendering the Scene

In this section, you will save and render the scene. You can also view the final render of the model by downloading the file *c03_cinema4d_r20_rndr.zip* from *www.cadcim.com*. The path of the file is mentioned at the beginning of the chapter.

1. Choose **File > Save** from the main menu; the **Save File** dialog box is displayed. In this dialog box, browse to the location *\Documents\c4dR20\c03*.

2. Enter **c03tut2** in the **File name** text box and then choose the **Save** button.

3. In the Perspective viewport, set the camera angle using the Viewport Navigation Tools located at the extreme top right of the Perspective viewport. Next, choose the **Render to Picture Viewer** tool from the Command Palette. Alternatively, press SHIFT+R; the **Picture Viewer** window is displayed.

4. In the **Picture Viewer** window, choose **File > Save as**; the **Save** dialog box is displayed.

5. In the **Save** dialog box, choose the **OK** button; the **Save Dialog** dialog box is displayed. Next, browse to *\Documents\c4dR20\c03*. In the **File Name** text box, type **c03_tut2_rndr**. Next, choose the **Save** button; the file is saved at the desired location.

Figure 3-66 displays the final output.

Tutorial 3

In this tutorial, you will create the model of a vase, as shown in Figure 3-122, using the **Cloner**, **Volume Builder**, and **Volume Mesher** tools. **(Expected time: 20 min)**

Figure 3-122 *Model of a vase*

The following steps are required to complete this tutorial:

a. Create the vase.
b. Create groove on the vase.
c. Create design on the vase.
c. Change the background color of the scene.
d. Save and render the scene.

Creating the Vase

In this section, you will create vase using the **Sphere** tool.

1. Press F4; the Front viewport is activated. Choose **Create > Object** from the main menu; a cascading menu is displayed. Next, choose **Sphere** from it; a sphere is created in the Front viewport and *Sphere* is added to the Object Manager. Choose **Display > Gouraud Shading** from the Menu in editor view; *Sphere* is displayed in the shading mode.

2. In the Attribute Manager, choose the **Basic** button; the **Basic Properties** area is displayed. In this area, enter **vase** in the **Name** text box; *Sphere* is renamed as *vase* in the Object Manager.

3. Make sure *vase* is selected in the Object Manager. In the Attribute Manager, choose the **Object** button; the **Object Properties** area is displayed. In the **Object Properties** area, set the parameters as follows:

Radius: **200** Segments: **48**

4. Choose the **Coord.** button and enter **1.5** in the **S.Y** spinner; *vase* is displayed as shown in Figure 3-123.

5. Make sure *vase* is selected in the Front viewport. Now, choose the **Make Editable** tool from the Modes Palette; *vase* is converted into a polygonal object.

6. Choose the **Live Selection** tool from the Command Palette and then choose the **Polygons** tool from the Modes Palette; *vase* is displayed in the polygon mode. In the Attribute Manager, make sure the **Options** button is chosen. In the **Options** area, clear the **Only Select Visible Elements** check box. Next, choose the **Live Selection** tool and select the polygons of *vase* in the Front viewport, as shown in Figure 3-124. If required, decrease the size of the cursor for selection.

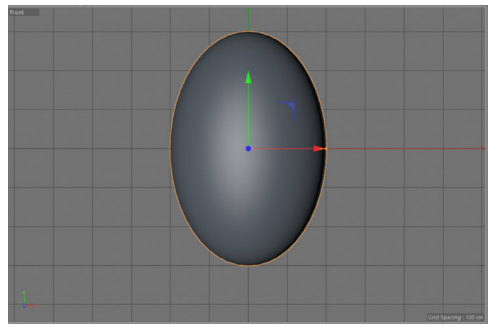

Figure 3-123 *vase displayed in the Front viewport*

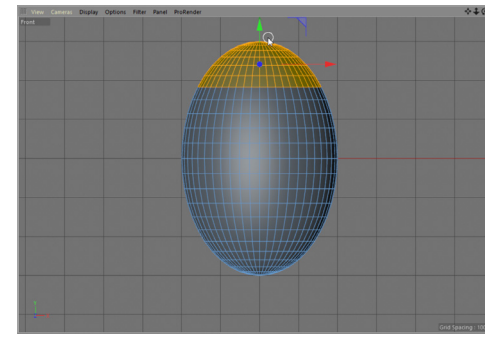

Figure 3-124 *Selected Polygons*

7. Scale down the selected polygons uniformly, refer to Figure 3-125. Next scale the polygons only in Y-axis to set them on the upper edge of *vase*, refer to Figure 3-126.

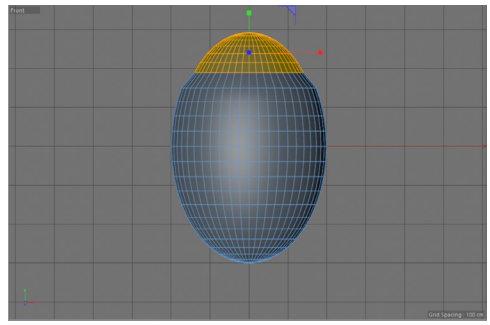

Figure 3-125 *Selected polygons scaled uniformly*

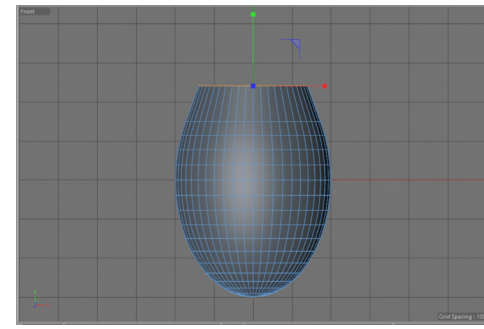

Figure 3-126 *Selected Polygons scaled in Y-axis*

8. Choose the **Move** tool from the Command Palette and move the selected polygons downword, as shown in Figure 3-127.

9. Right-click in the Front viewport; a shortcut menu is displayed. Choose **Extrude** from the shortcut menu; the **Extrude** tool settings are displayed in the Attribute Manager. In the **Extrude** tool settings area, make sure the **Options** button is chosen. In the **Options** area, set **-230** as the value in the **Offset** spinner and then press the ENTER key; the selected polygons are extruded in the Perspective viewport, as shown in Figure 3-128.

10. Choose the **Live Selection** tool and select the bottommost polygons of *vase*, as shown in Figure 3-129. Next, activate the **Scale** tool and scale these polygons in Y-axis as shown in Figure 3-130.

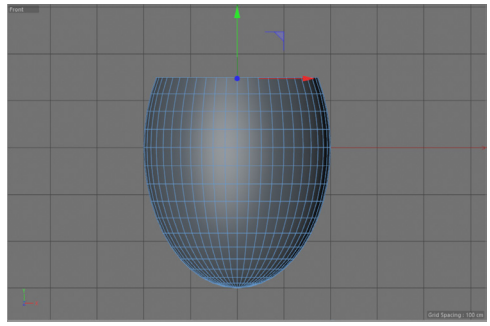

Figure 3-127 *Selected polygons moved downword*

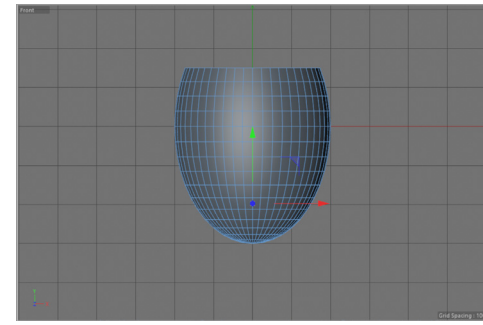

Figure 3-128 *Selected Polygons Extruded*

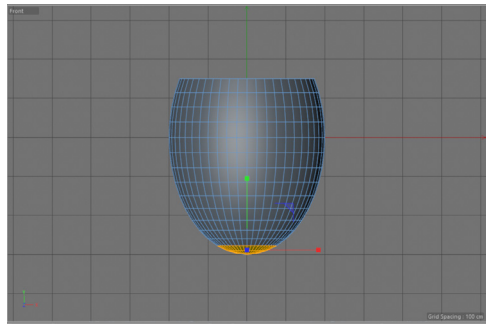

Figure 3-129 *Bottommost polygons selected*

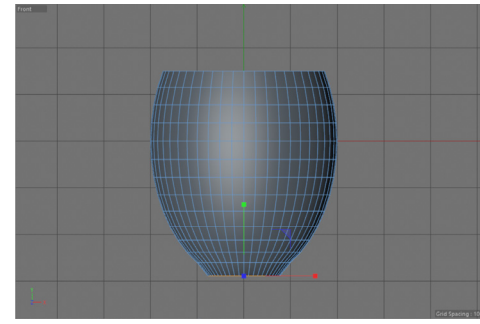

Figure 3-130 *Selected polygons scaled in y-axis*

11. Make sure the scaled polygons are selected. Next, right-click in the Front viewport; a shortcut menu is displayed. Choose **Bevel** from the shortcut menu; the **Bevel** tool settings are displayed in the Attribute Manager. In the **Bevel** tool settings area, make sure the **Tool Option** button is chosen. Next, set **-40** in the **Offset** spinner and **4** in the **Subdivision** spinner and then press the ENTER key; the selected polygons are beveled in the Perspective viewport, as shown in Figure 3-131.

Creating Groove on the Vase

In this section, you will create groove on vase using the **Torus**, **Volume Builder**, and **Volume Mesher** tools.

1. Choose **Create > Object** from the main menu; a cascading menu is displayed. Next, choose **Torus** from it; a torus is created in the Front viewport and *Torus* is added to the Object Manager.

2. Double-click on *Torus* in the Object Manager; a text box is displayed. Enter **ring** in the text box; *Torus* is renamed as *ring*.

3. Make sure *ring* is selected in the Object Manager. In the Attribute Manager, choose the **Object** button; the **Object Properties** area is displayed. In the **Object Properties** area, enter **20** in the **Pipe Radius** spinner.

4. Choose the **Coord.** button and enter **51** in the **P.Y** spinner; *Torus* is moved upwards, as shown in Figure 3-132.

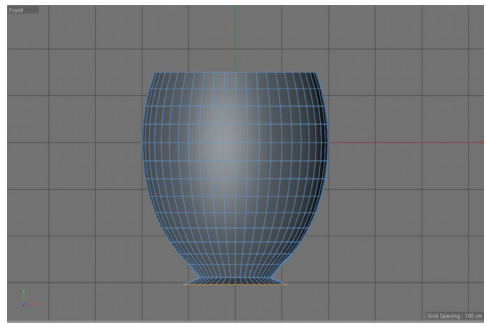

Figure 3-131 *Selected polygons beveled*

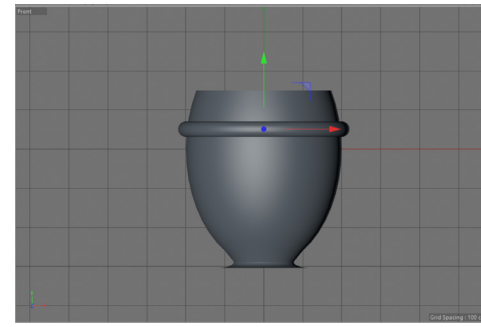

Figure 3-132 *Torus moved upwards*

5. Choose **Volume > Volume Builder** from the main menu, as shown in Figure 3-133; *Volume Builder* is added to the Object Manager.

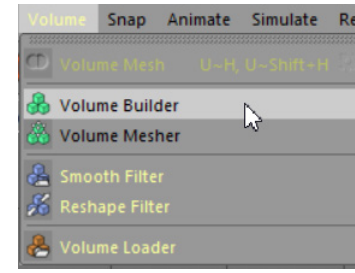

Figure 3-133 *Choosing* ***Volume Builder*** *from the* ***Volume*** *menu*

6. Select *vase* in the Object Manager. Next, press and hold the left mouse button and then drag it on *Volume Builder*; *vase* is connected to *Volume Builder*. Next, select *ring* in the Object Manager and press and hold the left mouse button and then drag it on *Volume Builder; ring* is also connected to *Volume Builder.* Notice that *vase* and *ring* turns white and both objects are conveted into voxel objects, refer to Figure 3-134.

7. Select *Volume Builder* in the Object Manager. In the Attribute Manager, make sure the **Object** button is chosen. In the **Object Properties** area, enter **1** in the **Voxel Size** spinner; *vase* and *ring* are smoothened comparatively, refer to Figure 3-135.

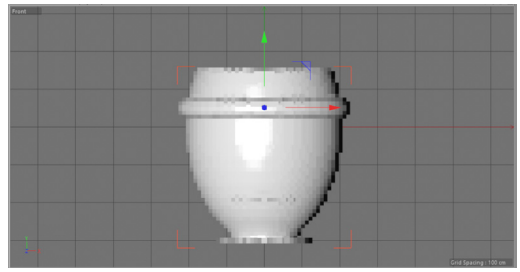

Figure 3-134 *Voxel objects displayed*

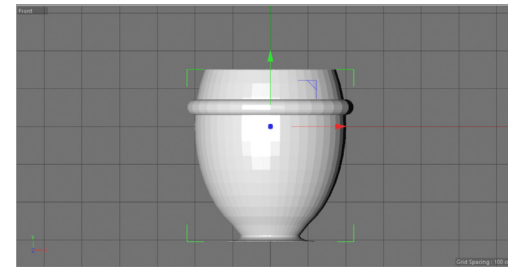

Figure 3-135 *Voxel objects smoothened*

8. Select **Subtract** from the **Mode** drop-down list located next to *ring*, as shown in Figure 3-136; groove is created on *vase*, as shown in Figure 3-137.

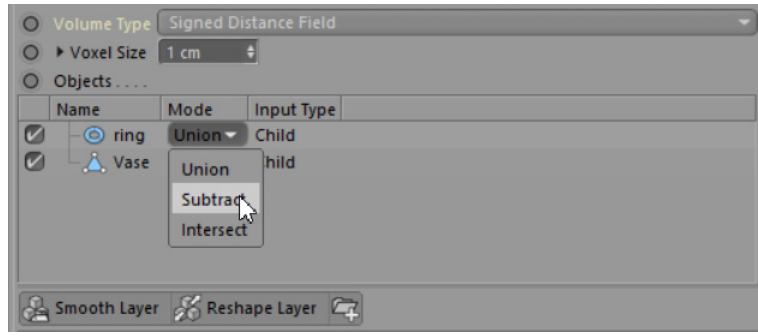

Figure 3-136 *Choosing* ***Subtract*** *from the* ***Mode*** *drop-down list*

9. Choose **Volume > Volume Mesher** from the main menu; *Volume Mesher* is added to the Object Manager.

10. Select *Volume Builder* in the Object Manager. Next, press and hold the left mouse button and then drag *Volume Builder* on *Volume Mesher*; *Volume Builder* is connected to *Volume Mesher* and *vase* is converted into polygon object. Also, notice that the color of *vase* turns dark grey, refer to Figure 3-138.

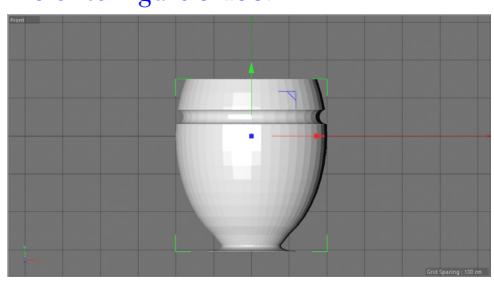

Figure 3-137 *Groove created on vase*

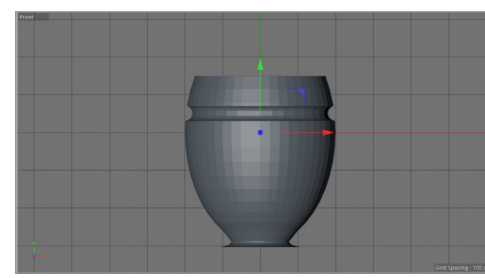

Figure 3-138 *vase turns dark grey*

Next, you will smoothen *vase*.

11. Select *Volume Builder* in the Object Manager. In the Attribute Manager, make sure the **Object** button is chosen. In the **Objects** area, select **ring** from the list displayed and then choose the **Smooth Layer** button; **Smooth Layer** is added to the list in the **Objects** area, as shown in Figure 3-139.

12. In the Attribute Manager, make sure **Smooth Layer** is selected in the **Objects** area. In the **Filter** area, enter **4** in the **Voxel Distance** spinner and enter **2** in the **Iterations** spinner; *vase* is smoothened, as shown in Figure 3-140.

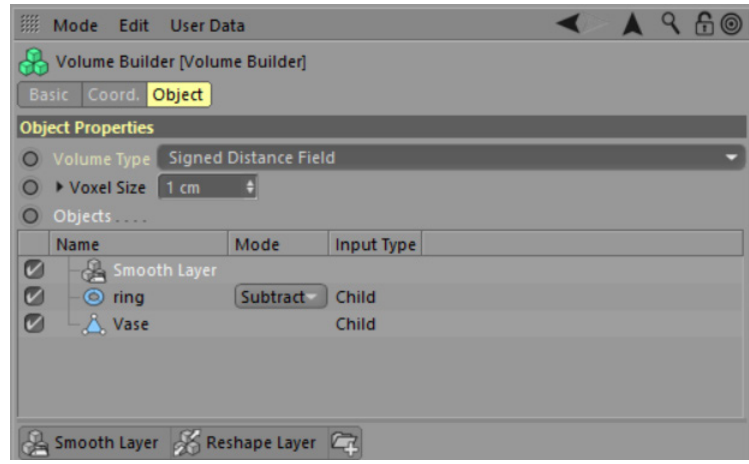

***Figure 3-139 Smooth Layer** added to the **Objects** area*

Creating Design on the Vase

In this section, you will create design on vase using the **Cloner** and **Volume Builder** tools.

1. Choose **Create > Object** from the main menu; a cascading menu is displayed. Next, choose **Cube** from the cascading menu; a cube is created in the Front viewport and *Cube* is added to the Object Manager.

2. Make sure *Cube* is selected in the Object Manager. In the **Object Properties** area of the Attribute Manager, enter **25** in the **Size.X**, **Size.Y** spinners, and **10** in the **Size.Z** spinner.

3. Choose **MoGraph > Cloner** from the main menu, as shown in Figure 3-141; *Cloner* is added to the Object Manager.

4. Select *Cube* in the Object Manager. Next, press and hold the left mouse button and then drag it on *Cloner*; *Cube* is connected to *Cloner*.

5. Select *Cloner* in the Object Manager. In the Attribute Manager, make sure the **Object** button is chosen. In the **Object Properties** area, select **Radial** from the **Mode** drop-down list and **XZ** from the **Plane** drop-down list. Also, enter **12** and **194** in the **Count** and **Radius** spinners, respectively.

6. In the Attribute Manager, choose the **Transform** button and enter **-67** in the **P.Y** spinner in the **Transform** area. Next, enter **-6** and **-45** in the **R.P** and **R.B** spinners, respectively. *Cloner* is placed on *vase* as shown in Figure 3-142.

7. Make sure that *Cloner* is selected in the Object Manager. Now, create a copy of *Cloner* by pressing both the CTRL key and the left mouse button. Now, drag the cursor and release the left mouse button; a copy of *Cloner* is created in the Object Manager with the name *Cloner.1*.

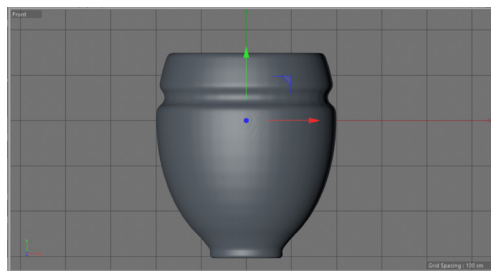

Figure 3-140 *vase smoothened*

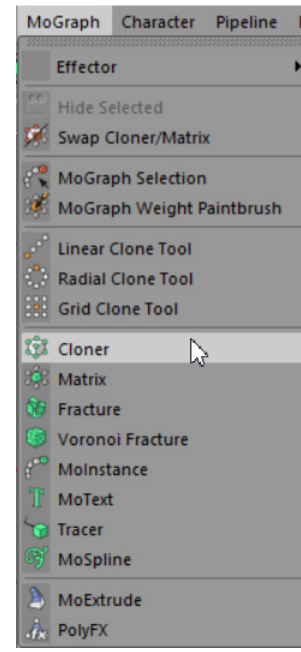

Figure 3-141 *Choosing* ***Cloner*** *from the* ***MoGraph*** *menu*

8. Make sure *Cloner.1* is selected in the Object Manager. In the Attribute Manager, choose the **Object** button. Next, enter **174** in the **Radius** spinner.

9. Choose the **Transform** button and enter **-145** in the **P.Y** spinner. Also, enter **-20** in the **R. P** spinner; *Cloner.1* is placed on *vase* as shown in Figure 3-143.

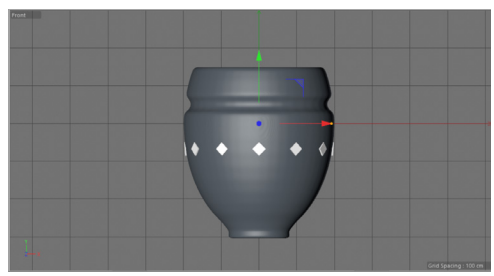

Figure 3-142 *Cloner placed on vase*

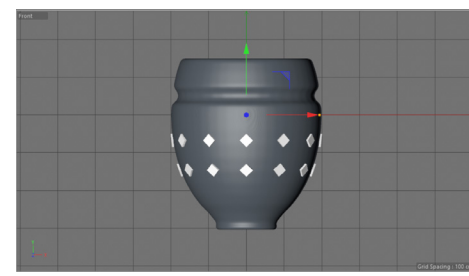

Figure 3-143 *Cloner.1 placed on vase*

10. Select *Cloner* in the Object Manager. Next, press and hold the left mouse button and then drag it on *Volume Builder*; *Cloner* is connected to *Volume Builder*. Next, select *Cloner.1* in the Object Manager and press and hold the left mouse button and then drag it on *Volume Builder; Cloner.1* is also connected to *Volume Builder. Figure 3-144* shows vase displayed in the viewport and Figure 3-145 shows list of all the objects in the Object Manager.

Changing the Background Color of the Scene

To change the background color of the scene to white in the final output, follow the steps given in Tutorial 1 of Chapter 2.

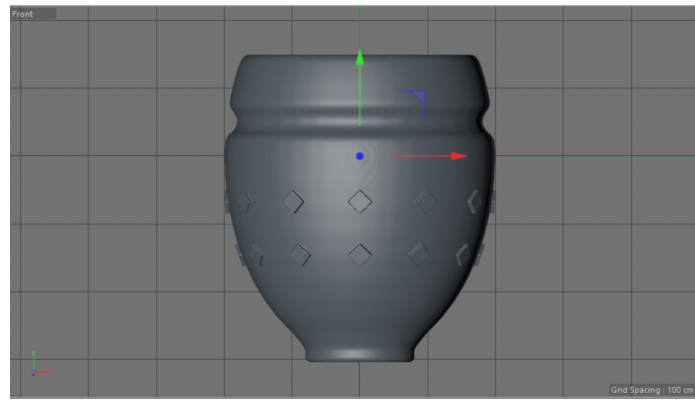

Figure 3-144 *vase displayed in the viewport*

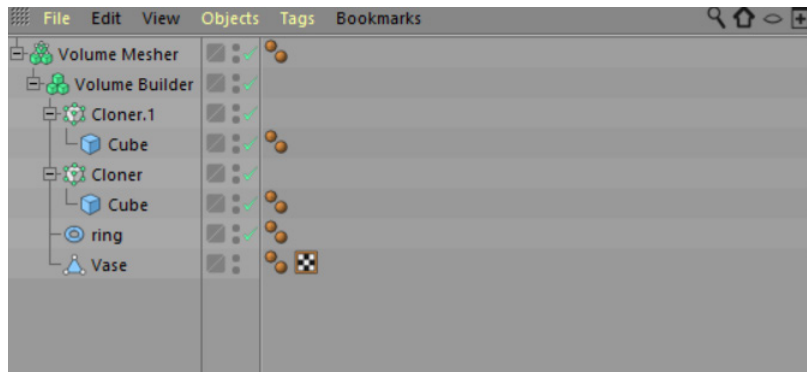

Figure 3-145 *List of all the objects in the Object Manager*

Saving and Rendering the Scene

In this section, you will save and render the scene. You can also view the final render of the model by downloading the file *c03_cinema4d_r20_rndr.zip* from *www.cadcim.com*. The path of the file is mentioned at the beginning of the chapter.

1. Choose **File > Save** from the main menu; the **Save File** dialog box is displayed. In this dialog box, browse to the location *\Documents\c4dR20\c03*.

2. Enter **c03tut3** in the **File name** text box and then choose the **Save** button.

3. In the Perspective viewport, set the camera angle using the Viewport Navigation Tools located at the extreme top right of the Perspective viewport. Next, choose the **Render to Picture Viewer** tool from the Command Palette. Alternatively, press SHIFT+R; the **Picture Viewer** window is displayed.

4. In the **Picture Viewer** window, choose **File > Save as**; the **Save** dialog box is displayed.

5. In the **Save** dialog box, choose the **OK** button; the **Save Dialog** dialog box is displayed. Next, browse to *\Documents\c4dR20\c03*. In the **File Name** text box, type **c03_tut3_rndr**. Next, choose the **Save** button; the file is saved at the desired location.

Figure 3-122 displays the final output.

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 tools in the Command Palette is used to select points, edges, or polygons by creating a rectangular frame around the object?

(a) **Move** (b) **Rectangle Selection**
(c) **Use Point Mode** (d) **Live Selection**

2. The _____ tool in the **Select** menu is used to select the edge loop to modify a polygonal object.

3. The _____ tool in the **Select** menu is used to select elements that form a ring shape.

4. The _____ tool is used to cut polygon objects.

Review Questions

Answer the following questions:

1. Which of the following combinations of shortcut keys is used to display the **Picture Viewer** window?

(a) CTRL+B (b) SHIFT+ R
(c) CTRL+C (d) CTRL+V

2. Which of the following functional keys is used to maximize the Perspective viewport?

(a) F1 (b) F5
(c) F4 (d) F6

3. The **Loop** option in the **Mode** drop-down list located in the **Loop/Path Cut** tool settings is used to create edge loops in a polygonal object. (T/F)

EXERCISE

The rendered output of the model used in the exercise can be accessed by downloading the *c03_cinema4d_R20_exr.zip* file from *www.cadcim.com*. The path of the file is as follows: *Textbooks > Animation and Visual Effects > MAXON CINEMA 4D > MAXON CINEMA 4D R20 Studio: A Tutorial Approach*

Exercise 1

Using the polygon modeling tools, create the model of the chair, as shown in Figure 3-146.

(Expected time: 30 min)

Figure 3-146 *The model of a chair*

Answers to Self-Evaluation Test

1. b, **2. Loop Selection**, **3. Ring Selection**, **4. Loop/Path Cut**