Exercise Eight. Solid Modeling Example

Creating the Base

Command	Type: BOX
Center/<center of box><0,0,0>	Click a point on the screen to locate the lower left corner of the base
Cube length<other corner>	Type: @6,3
Height	Type: 0.75
Command	Type: UCS
	Move the UCS origin to the lower left corner of the base for convenience
Origin/Zaxis/3point/…	Type: O for Origin
Origin Point <0,0,0>	Click on the lower left corner
Command	Type: VPOINT
Rotate/<view point><0,1,0>	Type: 1,-1,1 to see what you are doing
Command	Type or select: PLINE
From point:	Type: 0,1
Arc/Close/…	Type: @0.75,0
Arc/Close/…	Type: A for Arc
<Endpoint of arc>	Type: @0,1
<Endpoint of arc>	Type: L for line
<Endpoint of line>	Click on the left edge of the box
<Endpoint of line>	Type: C for Close
Command	Type: ISOLINES
New value:	Type: 10
Command	Type: EXTRUDE
Select Objects:	Click on the PLINE you just drew
Path/<height>	Type: 0.75
Extrusion taper angle:	Hit ENTER
Command	Type or select: MIRROR
	Mirror the slot using the midpoints along the long sides of the base

Creating the Cylinder

Command	Type: UCS
	Rotate the UCS 90 degrees about the X axis
Command	Type: CYLINDER
Elliptical/<center point><0,0,0>	Type: 3,1.38
Diameter/<radius>	Type: D for diameter
Diameter	Type: 1.5
Center of other end/<height>	Type: -3
Command	Hit ENTER
Elliptical/<center point>	Type: 3,1.38
Diameter/<radius>	Type: 1.125

Center of other end/<height>	Type: -3

Combining the Two Solids

Command	Type: SUBTRACT
Select regions to subtract from	Select the base
Select regions to subtract	Select the two slots
Command	Hit ENTER
Select objects	Click on the large cylinder
Select objects to subtract	Click on the smaller cylinder
Command	Type: UNION
Select objects	Click on the base and the cylinder

Fill the Area Between the Cylinder and Base and Add Fillets

Draw a PLINE between cylinder and base
Command	Type: PLINE
From point:	Click on the large cylinder at 3 o'clock
Arc/Close/…	Click on the base below first point
Arc/Close/…	Click on a third point where large cylinder and base intersect
Arc/Close/…	Type: C for Close
Command	Type: EXTRUDE
Select objects:	Click on the PLINE
Path/<height>	Type: -3
Extrusion taper angle:	Hit ENTER
Command:	Type or Select: MIRROR
Select objects:	Click on the PLINE extrusion

Mirror along the long sides of the base.

Command	Type: UNION
Select objects:	Click on the base/cylinder and the PLINEs
Command	Type: FILLET
Polyline/Radius/Trim	Click on the intersection of the PLINE and Base on one side of the cylinder
Enter radius:	Type: 0.25
Chain/radius:	Click on front, left edge intersection of PLINE and Base
Chain/Radius:	Hit ENTER

The edges have now been filleted.

Remove hidden lines by selecting View-Hide.

Command:	Type: RENDER

Attach a material to the Model.
Render a Photo Raytrace in Render Window.