



5/17/2023

# LAB#06

Engineering drawing

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NIM-BSEE-2021-34

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## **Course Learning Outcomes**

CLO1: Ability to read basic engineering drawings problems.

CLO3: Reproduce 2-D and 3-D sketches using AutoCAD by applying engineering drawing principles.

## **Equipment**

- Software
  - AutoCAD 2016 Educational Version

## **Instructions**

The following instructions are to be followed while performing the labs:

- The manual must be thoroughly read before starting the lab.
- The theoretical concepts related to the lab and experiments must be revised.
- All attempts shall be made to complete the lab during the lab session.
- Any attempt to plagiarize from any source will be reported to the disciplinary committee for further action, so keep the work original.

## Objectives

- To get hands on experience of AutoCAD software.

## Background Information

Basic drawing tools are used to create some simple drawings. However, to create complex drawings, various editing operations are required to perform. The tools to perform the editing operations are available in the Modify panel on the home ribbon. Using these editing tools, existing objects are modified or use existing objects to create new or similar objects.



## Move tool

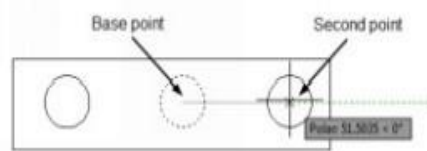
The Move tool moves a selected object(s) from one location to a new location without changing its orientation. To move objects, you must activate this tool and select the objects from the graphics window. After selecting objects, you must define the 'base point' and the 'destination point'.

## Example:

Create the drawing as shown below.



Click **Home > Modify > Move** on the ribbon or enter **M** in the command line. Click on the circle located at the right-side, and then right-click to accept the selection. Select the center of the circle as the base point. Make sure that the **Ortho Mode** is activated. Move the pointer toward right and pick a point as shown below. This moves the circle to the new location.



## The Copy tool

The Copy tool is used to copy objects and place them at a required location. This tool is similar to the Move tool, except that the object will remain at its original position and a copy of it will be placed at the new location.

## Rotate Tool

The Rotate tool rotates an object or a group of objects about a base point.

## Scale Tool

The Scale tool changes the size of objects. It reduces or enlarges the size without changing the shape of an object.

## Trim Tool

When an object intersects with another object, you can remove its unwanted portion by using the **Trim** tool. If there are multiple intersection points in a drawing, then it simply selects the select all option from the command line; all the objects in the drawing objects will act as 'cutting edges.

- Click **Home > Modify > Trim** on the ribbon or enter **TR** in the command line. Now, you must select the cutting edges.
- Press ENTER to select all the objects as cutting edges. Now, you must select the objects to be trimmed.

## The Extend tool

The Extend tool is similar to the Trim tool but its use is opposite of it. This tool is used to extend lines, arcs and other open entities to connect to other objects. To do so, you must select the boundary up to which you want to extend the objects, and then select the objects to be extended.

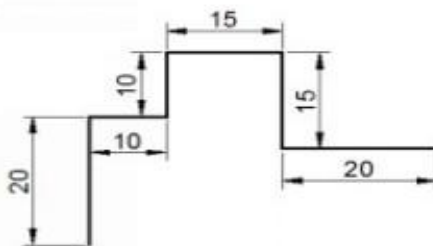
- Start a new drawing.
- Create a sketch using the Line tool.
- Click **Home > Modify > Extend** on the ribbon or enter **EX** in the command line.
- Select the vertical line as the boundary edge. Next, right-click.
- Select the horizontal open line. This will extend the line up to the boundary edge.

## Fillet Tool

The Fillet tool converts the sharp corners into round corners. It is required to define the radius and select the objects forming a corner.

You must define the radius and select the objects forming a corner.

- Start a new drawing.
- Type **Limmax** in the command line and press **ENTER**.
- Set the maximum limit to 100,100 and press **ENTER**.
- Click Zoom All on the Navigation Bar.
- Click Home > Draw > Polyline on the ribbon.
- Define the start point as 20, 50.
- Draw the lines as shown below



- Right-click and select **Enter**.
- Click **Home > Modify > Fillet** on the ribbon or enter **F** in the command line.
- Select the **Radius** option from the command line.
- Type 5 and press **ENTER**.

- Select the vertical line and the horizontal line as shown below.
- Notice that a fillet is created.



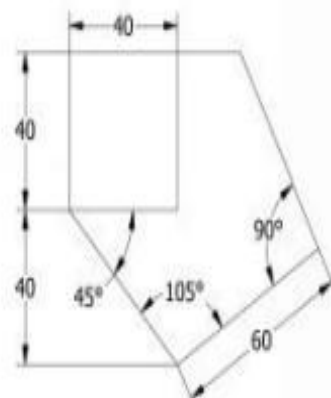
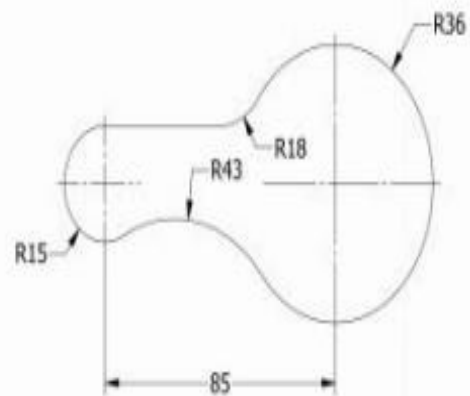
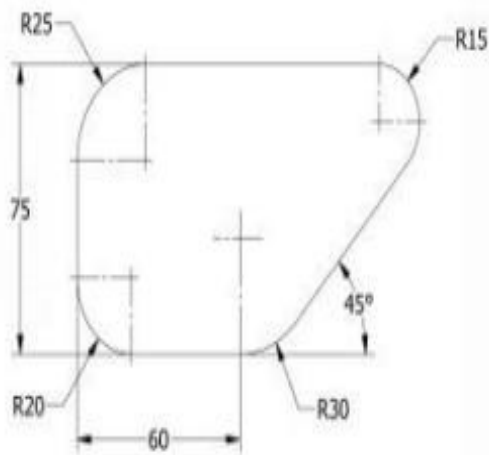
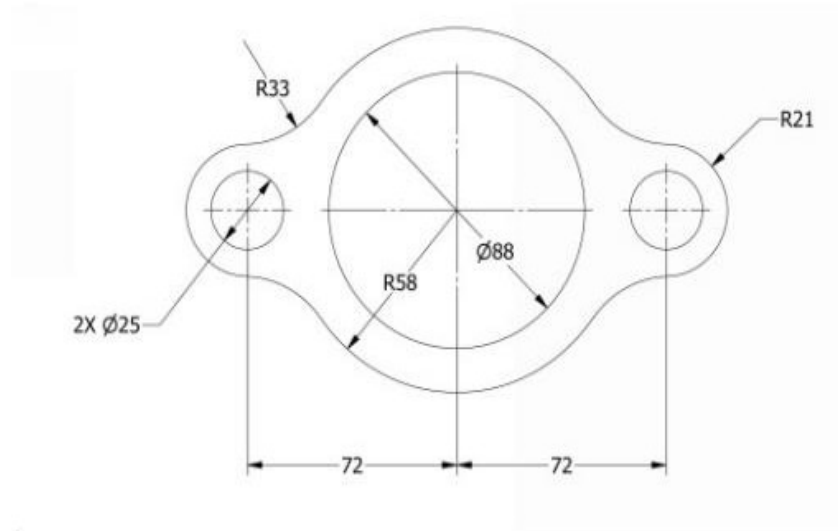
## The Chamfer tool

The **Chamfer** tool replaces the sharp corners with an angled line. This tool is similar to the **Fillet** tool, except that an angled line is placed at the corners instead of rounds.

- Click **Home > Modify > Fillet > Chamfer** on the ribbon or enter **CHA** in the command line.
- Follow the prompt sequence given next: Select first line or [Undo/Polyline/Distance/Angle/Trim/Method/Multiple]:
- Select the Distance option from the command line.
- Define first chamfer distance: Enter 8 as the first chamfer distance and press ENTER.
- Define second chamfer distance: Press **ENTER** to accept 8 as the second chamfer distance.
- Select first line or [Undo/Polyline/Distance/Angle/Trim/Method/Multiple]: Select the vertical line on the right-side.
- Select second line or shift-select to apply corner or [Distance/Angle/Method]: Select the horizontal line connected to the vertical line.

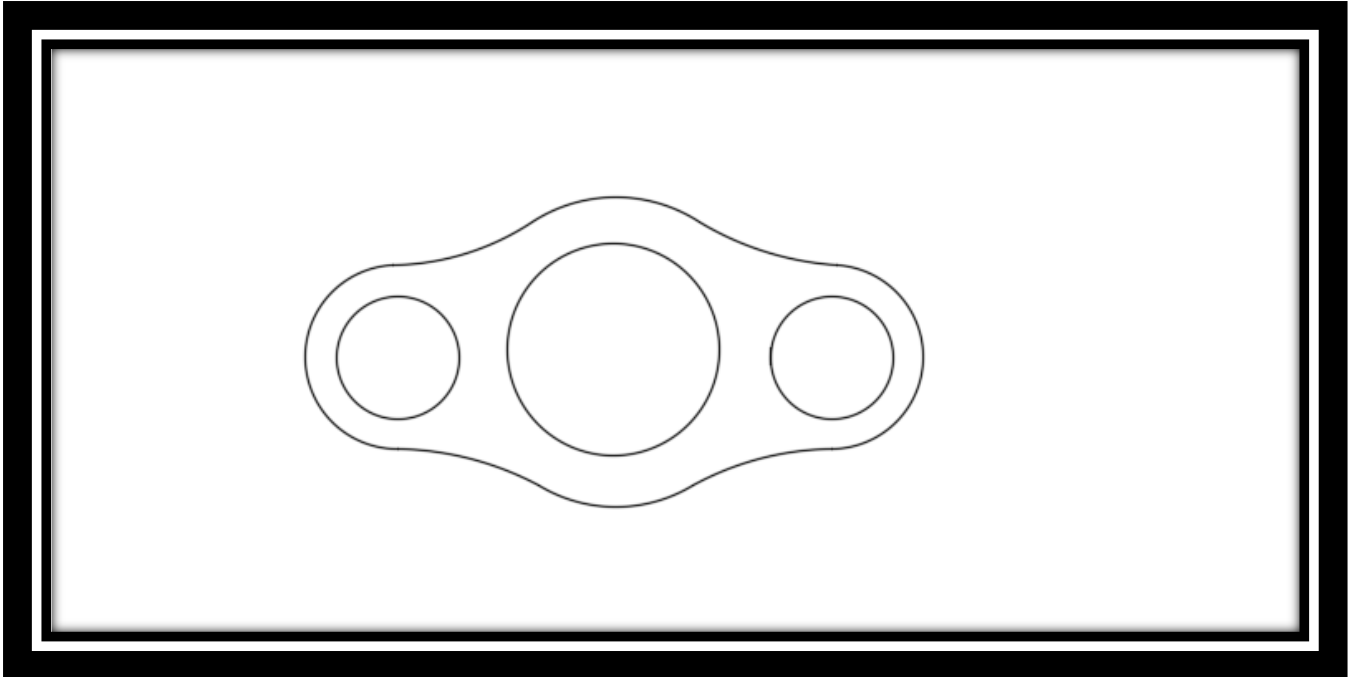
**Task:**

Draw the drawing as shown below. Also, write the procedure aided with the command sequence.



# Introduction to Editing tools of AutoCAD 2022

## Task1:



## Procedure:

In this task

- Firstly I drew 6 circles
- Trimmed unnecessary parts
- and used fillet command

Commands of task1:

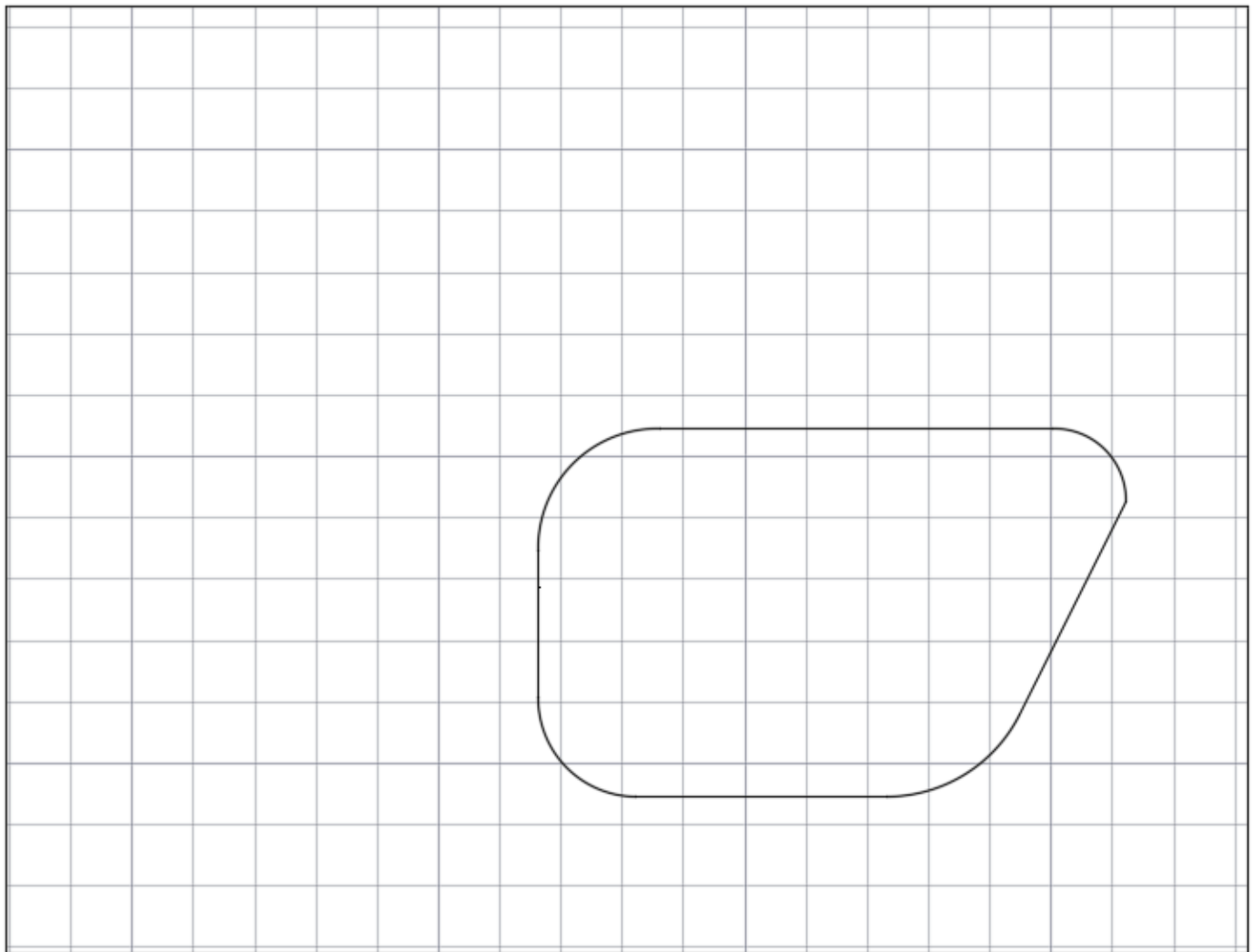
<ul style="list-style-type: none"><li>• Command:</li><li>• Command: <code>_extend</code></li><li>• Current settings: Projection=UCS, Edge=None</li><li>• Select boundary edges ...</li><li>• Select objects or &lt;select all&gt;: 1 found</li><li>• Select objects: Specify opposite corner: *Cancel*</li><li>• 0 found</li><li>• Select objects: *Cancel*</li><li>• Command:</li><li>• Command: <code>_trim</code></li><li>• Current settings: Projection=UCS, Edge=None</li><li>• Select cutting edges ...</li><li>• Select objects or &lt;select all&gt;:</li><li>• Select object to trim or shift-select to extend or</li><li>• [Fence/Crossing/Project/Edge/eRase/Undo]:</li></ul>	<p>Select cutting edges ... 6 found</p> <p>Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]:</p> <p>Specify opposite corner: Specify opposite corner: *Cancel*</p> <p>Crossing Lasso Press Spacebar to cycle options</p> <p>Command:</p> <p>Command:</p> <p>Command: <code>_trim</code></p> <p>Current settings: Projection=UCS, Edge=None</p> <p>Select cutting edges ... 6 found</p> <p>Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]: Specify opposite corner: Specify opposite corner: *Cancel*</p> <p>Crossing Lasso Press Spacebar to cycle options</p> <p>Command:</p> <p>Command:</p> <p>Command: <code>_trim</code></p> <p>Current settings: Projection=UCS, Edge=None</p> <p>Select cutting edges ... 6 found</p> <p>Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]:</p>
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<ul style="list-style-type: none"> <li>Automatic save to C:\Users\bsee202134\appdata\local\temp\Drawing1_1_1_1999.sv\$ ...</li> <li>Command: _trim</li> <li>Current settings: Projection=UCS, Edge=None</li> <li>Select cutting edges ... 1 found</li> <li>Select object to trim or shift-select to extend or</li> <li>[Fence/Crossing/Project/Edge/eRase/Undo]:</li> <li>Does not intersect with the cutting edge.</li> <li>Select object to trim or shift-select to extend or</li> <li>[Fence/Crossing/Project/Edge/eRase/Undo]:</li> <li>Command:</li> <li>TRIM</li> <li>Command: _trim</li> <li>Current settings: Projection=UCS, Edge=None</li> <li>Select cutting edges ... 1 found</li> <li>Select object to trim or shift-select to extend or</li> <li>[Fence/Crossing/Project/Edge/eRase/Undo]: Specify opposite corner: Specify opposite corner:</li> </ul> <p>Specify fillet radius &lt;0.2883&gt;: 18</p> <p>Select first object or [Undo/Polyline/Radius/Trim/Multiple]:</p> <p>Select first object or [Undo/Polyline/Radius/Trim/Multiple]:</p> <p>Select second object or shift-select to apply corner or [Radius]:</p> <p>Command:</p> <p>Command: _fillet</p> <p>Current settings: Mode = TRIM, Radius = 18.0000</p> <p>Select first object or [Undo/Polyline/Radius/Trim/Multiple]: R</p> <p>Specify fillet radius &lt;18.0000&gt;: 18</p> <p>Select first object or [Undo/Polyline/Radius/Trim/Multiple]:</p> <p>Select second object or shift-select to apply corner or [Radius]:</p> <p>Command: Specify opposite corner or [Fence/WPolygon/CPolygon]</p> <ul style="list-style-type: none"> <li>Invalid window specification.</li> <li>Specify opposite corner: Specify opposite corner: *Cancel*</li> <li>Command:</li> <li>Command:</li> <li>Command: _undo</li> </ul> <p>Current settings: Auto = On, Control = All, Combine = Yes, Layer = Yes</p>	<p>Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]:</p> <p>Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]:</p> <p>Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]: *Cancel*</p> <p>Window Lasso Press Spacebar to cycle options</p> <p>Command:</p> <p>Command:</p> <p>Command: _trim</p> <p>Current settings: Projection=UCS, Edge=None</p> <p>Select cutting edges ... 6 found</p> <p>Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]:</p> <p>Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]: Specify opposite corner: Specify opposite corner:</p> <p>Specify opposite corner: Specify opposite corner: Invalid window specification.</p> <p>Specify opposite corner: Specify opposite corner: Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]: Specify opposite corner: Specify opposite corner:</p> <p>No objects crossed by crossing window.</p> <p>Select object to trim or shift-select to extend or Window Lasso Press Spacebar to cycle options</p> <p>Command: Specify opposite corner or [Fence/WPolygon/CPolygon]:</p> <p>Command: *Cancel*</p> <p>Crossing Lasso Press Spacebar to cycle options</p> <p>Command:</p> <p>Command:</p> <p>Command: _trim</p> <p>Current settings: Projection=UCS, Edge=None</p> <p>Select cutting edges ... 7 found</p> <p>Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]:</p> <p>Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]: Specify opposite corner: Specify opposite corner:</p> <p>Invalid window specification.</p> <p>Specify opposite corner: Specify opposite corner: *Cancel*</p> <p>Command:</p> <p>Command:</p> <p>Command: _fillet</p> <p>Current settings: Mode = TRIM, Radius = 0.2883</p> <p>Select first object or [Undo/Polyline/Radius/Trim/Multiple]:</p> <p>Select second object or shift-select to apply corner or [Radius]:</p> <p>Command:</p> <p>Command:</p> <p>Command:</p> <p>Command: _fillet</p> <p>Current settings: Mode = TRIM, Radius = 0.2883</p> <p>Select first object or [Undo/Polyline/Radius/Trim/Multiple]: R</p> <p>Specify fillet radius &lt;0.2883&gt;: 12`*Cancel*</p>
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<ul style="list-style-type: none"> <li>• Enter the number of operations to undo or [Auto/Control/BEGIN/End/Mark/Back] &lt;1&gt;: 1 LINE GROUP</li> <li>• Command:</li> <li>• Command:</li> <li>• Command:</li> <li>• Command: <code>_.undo</code> Current settings: Auto = On, Control = All, Combine = Yes, Layer = Yes</li> <li>• Enter the number of operations to undo or [Auto/Control/BEGIN/End/Mark/Back] &lt;1&gt;: 1 LINE GROUP</li> <li>• Command: <code>_u</code> LINE GROUP</li> <li>• Crossing Lasso Press Spacebar to cycle options</li> <li>• Command:</li> <li>• Command:</li> <li>• Command: <code>_trim</code></li> <li>• Current settings: Projection=UCS, Edge=None</li> </ul> <p>Command:</p> <p>Command: <code>_fillet</code></p> <p>Current settings: Mode = TRIM, Radius = 18.0000</p> <p>Select first object or [Undo/Polyline/Radius/Trim/Multiple]: R</p> <p>Specify fillet radius &lt;18.0000&gt;: 18</p> <p>Select first object or [Undo/Polyline/Radius/Trim/Multiple]:</p> <p>Select second object or shift-select to apply corner or [Radius]:</p> <p>Command:</p> <p>Command: <code>_.erase</code> 1 found</p> <p>Command: &lt;Grid on&gt;</p> <p>Command: &lt;Grid off&gt;</p> <p>Command:</p> <p>Automatic save to C:\Users\bsee202134\appdata\local\temp\Drawin g1_1_1_1999.svg ...</p> <p>Command:</p> <p>Command:</p> <p>Crossing Lasso Press Spacebar to cycle options</p> <p>Command: PEDIT</p> <p>Command:</p> <p>Command: <code>_ai_selall</code> Selecting objects...done.</p> <p>Command: <code>_u</code> AI_SELALL GROUP</p>	<p>12`</p> <p>Crossing Lasso Press Spacebar to cycle options</p> <p>Command:</p> <p>Command:</p> <p>Command: <code>_fillet</code></p> <p>Current settings: Mode = TRIM, Radius = 0.2883</p> <p>Select first object or [Undo/Polyline/Radius/Trim/Multiple]:</p> <p>Select second object or shift-select to apply corner or [Radius]: R</p> <p>Specify fillet radius &lt;0.2883&gt;: 33</p> <p>Select second object or shift-select to apply corner or [Radius]:</p> <p>Command: <code>_u</code> FILLET GROUP</p> <p>Window Lasso Press Spacebar to cycle options</p> <p>Command:</p> <p>Command:</p> <p>Command: <code>_fillet</code></p> <p>Current settings: Mode = TRIM, Radius = 0.2883</p> <p>Select first object or [Undo/Polyline/Radius/Trim/Multiple]: R</p> <p>Specify fillet radius &lt;0.2883&gt;: 22</p> <p>Select first object or [Undo/Polyline/Radius/Trim/Multiple]:</p> <p>Select second object or shift-select to apply corner or [Radius]:</p> <p>Command: *Cancel*</p> <p>Command: *Cancel*</p> <p>Command:</p> <p>Command:</p> <p>Command: <code>_.undo</code> Current settings: Auto = On, Control = All, Combine = Yes, Layer = Yes</p> <p>Enter the number of operations to undo or [Auto/Control/BEGIN/End/Mark/Back] &lt;1&gt;: 1 FILLET GROUP</p> <p>Window Lasso Press Spacebar to cycle options</p> <p>Command: *Cancel*</p> <p>Window Lasso Press Spacebar to cycle options</p> <p>Command:</p> <p>Command:</p> <p>Command: <code>_fillet</code></p> <p>Current settings: Mode = TRIM, Radius = 0.2883</p> <p>Select first object or [Undo/Polyline/Radius/Trim/Multiple]: R</p> <p>]:</p>
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## Task2:



### Procedure:

I used following commands

Firstly I darwed a rectrangle

And I used fillet command with different radius

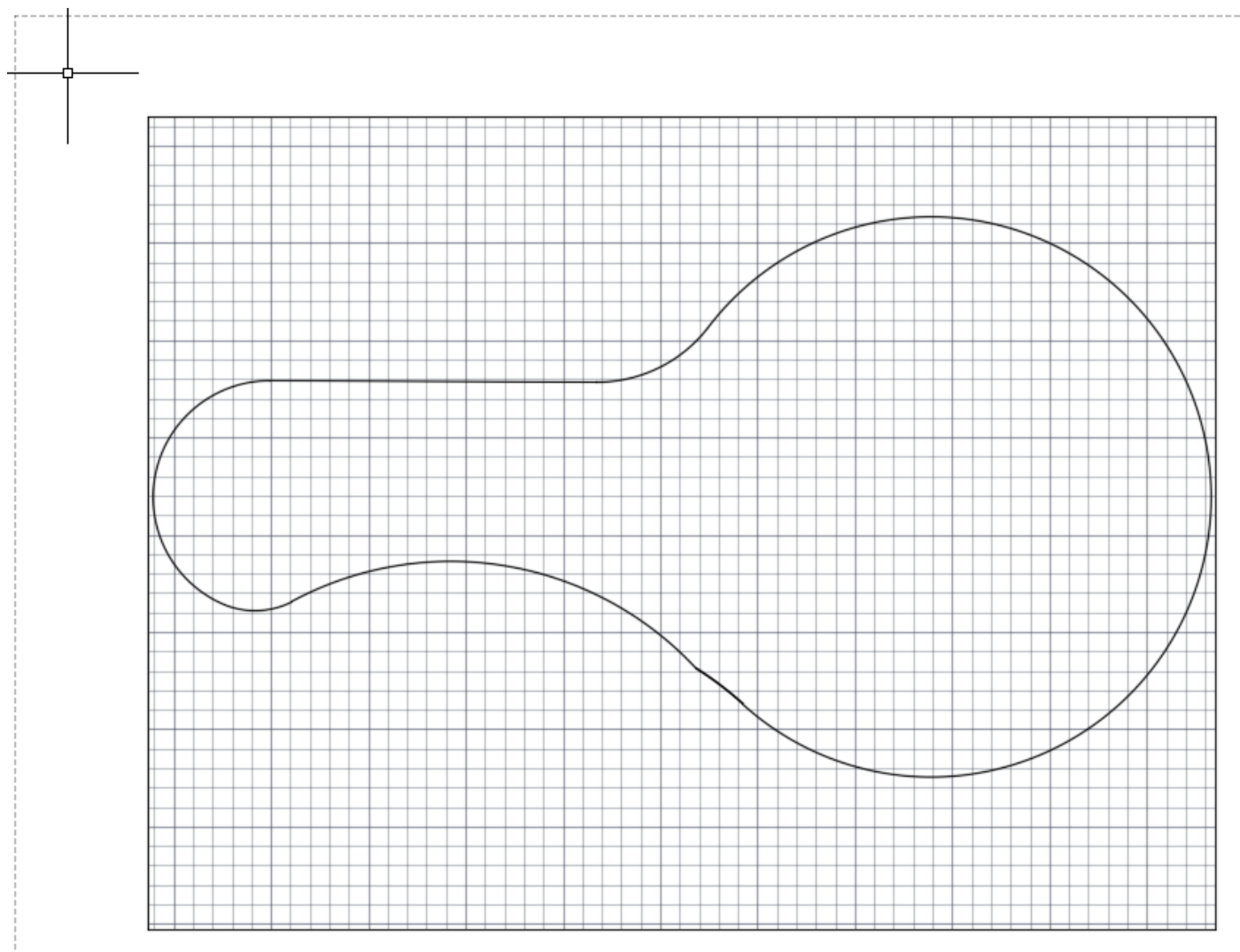
### Commands

egenerating model. AutoCAD menu utilities loaded. AutoCAD Electrical menu utilities loaded. Command: Command: _rectang Specify first corner point or [Chamfer/Elevation/Fillet/Thickness/Width] : Specify other corner point or [Area/Dimensions/Rotation]: Command: ** MOVE AND ALIGN ** Specify origin point or align to face, surface, or mesh:	Select first object or [Undo/Polyline/Radius/Trim/Multiple]: *Cancel* Command: Command: _fillet Current settings: Mode = TRIM, Radius = 0.0000 Select first object or [Undo/Polyline/Radius/Trim/Multiple]: R Specify fillet radius <0.0000>: 25 Select first object or [Undo/Polyline/Radius/Trim/Multiple]: Select second object or shift-select to apply corner or [Radius]: Command: Command: Command: _fillet Current settings: Mode = TRIM, Radius = 25.0000 Select first object or [Undo/Polyline/Radius/Trim/Multiple]: R
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<p>Command:</p> <p>Command:</p> <p>Command: <code>_rectang</code></p> <p>Specify first corner point or [Chamfer/Elevation/Fillet/Thickness/Width]:</p> <p>Specify other corner point or [Area/Dimensions/Rotation]: 120</p> <p>Command: Regenerating model.</p> <p>*Cancel*</p> <p>Command:</p> <p>Command:</p> <p>Command: <code>_.undo</code> Current settings: Auto = On, Control = All, Combine = Yes, Layer = Yes</p> <p>Specify first corner point or [Chamfer/Elevation/Fillet/Thickness/Width]:</p> <p>Specify other corner point or [Area/Dimensions/Rotation]:</p> <p>Command: *Cancel*</p> <p>Command:</p> <p>Command:</p> <p>Command: <code>_.undo</code> Current settings: Auto = On, Control = All, Combine = Yes, Layer = Yes</p> <p>Enter the number of operations to undo or [Auto/Control/BEGIN/End/Mark/Back] &lt;1&gt;: 1 RECTANG</p> <p>Command:</p> <p>Command:</p> <p>Command: <code>_.undo</code> Current settings: Auto = On, Control = All, Combine = Yes, Layer = Yes</p> <p>Enter the number of operations to undo or [Auto/Control/BEGIN/End/Mark/Back] &lt;1&gt;: 1 RECTANG GROUP</p> <p>Command:</p> <p>Command:</p> <p>Command: <code>_rectang</code></p> <p>Specify first corner point or [Chamfer/Elevation/Fillet/Thickness/Width]: d</p> <p>Point or option keyword required.</p> <p>Specify first corner point or [Chamfer/Elevation/Fillet/Thickness/Width]: 120</p> <p>Specify other corner point or [Area/Dimensions/Rotation]:</p> <p>2D point or option keyword required.</p> <p>Specify other corner point or [Area/Dimensions/Rotation]: D</p> <p>Specify length for rectangles &lt;10.0000&gt;: 120</p> <p>Specify width for rectangles &lt;10.0000&gt;: 75</p> <p>Specify other corner point or [Area/Dimensions/Rotation]:</p>	<p>Specify fillet radius &lt;25.0000&gt;: 20</p> <p>Select first object or [Undo/Polyline/Radius/Trim/Multiple]:</p> <p>Select second object or shift-select to apply corner or [Radius]:</p> <p>Command:</p> <p>Command:</p> <p>Command: <code>_fillet</code></p> <p>Current settings: Mode = TRIM, Radius = 20.0000</p> <p>Select first object or [Undo/Polyline/Radius/Trim/Multiple]: R</p> <p>Specify fillet radius &lt;20.0000&gt;: 15</p> <p>Select first object or [Undo/Polyline/Radius/Trim/Multiple]:</p> <p>Select second object or shift-select to apply corner or [Radius]:</p> <p>Command:</p> <p>Command:</p> <p>Enter the number of operations to undo or [Auto/Control/BEGIN/End/Mark/Back] &lt;1&gt;: 1 INTELLIZOOM</p> <p>Command:</p> <p>Command:</p> <p>Command: <code>_.undo</code> Current settings: Auto = On, Control = All, Combine = Yes, Layer = Yes</p> <p>Enter the number of operations to undo or [Auto/Control/BEGIN/End/Mark/Back] &lt;1&gt;: 1 RECTANG GROUP</p> <p>Command:</p> <p>Command:</p> <p>Command: <code>_rectang</code></p> <p>Specify first corner point or [Chamfer/Elevation/Fillet/Thickness/Width]:</p> <p>Specify other corner point or [Area/Dimensions/Rotation]:</p> <p>Command: *Cancel*</p> <p>Command:</p> <p>RECTANG</p> <p>Command: <code>_fillet</code></p> <p>Current settings: Mode = TRIM, Radius = 15.0000</p> <p>Select first object or [Undo/Polyline/Radius/Trim/Multiple]: R</p> <p>Specify fillet radius &lt;15.0000&gt;: 30</p> <p>Select first object or [Undo/Polyline/Radius/Trim/Multiple]:</p> <p>Select second object or shift-select to apply corner or [Radius]:</p> <p>Command:</p> <p>Command:</p> <p>Command: <code>_line</code></p> <p>Specify first point:</p> <p>Specify next point or [Undo]:</p> <p>Specify next point or [Undo]: *Cancel*</p> <p>Command:</p> <p>Command: Specify opposite corner or [Fence/WPolygon/CPolygon]:</p> <p>Command:</p> <p>LINE</p> <p>Specify first point: *Cancel*</p> <p>Command:</p> <p>Command: <code>_trim</code></p> <p>Current settings: Projection=UCS, Edge=None</p> <p>Select cutting edges ...</p> <p>Select objects or &lt;select all&gt;:</p> <p>Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]: Specify opposite corner: Specify opposite corner:</p> <p>Invalid window specification.</p>
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<p>Command: Specify opposite corner or [Fence/WPolygon/CPolygon]:</p> <p>Command: Specify opposite corner or [Fence/WPolygon/CPolygon]:</p> <p>Command:</p> <p><b>** MOVE AND ALIGN **</b></p> <p>Specify origin point or align to face, surface, or mesh:</p> <p>Command: Specify opposite corner or [Fence/WPolygon/CPolygon]:</p> <p>Command:</p> <p>Command:</p> <p>Command: <code>_move</code> 1 found</p> <p>Specify base point or [Displacement]</p> <p>&lt;Displacement&gt;:</p> <p>Specify second point or &lt;use first point as displacement&gt;:</p> <p>Window Lasso Press Spacebar to cycle options</p> <p>Command: Specify opposite corner or [Fence/WPolygon/CPolygon]:</p> <p>Command:</p> <p>Command:</p> <p>Command:</p> <p>Command: <code>_fillet</code></p> <p>Current settings: Mode = TRIM, Radius = 0.0000</p> <p>Select first object or [Undo/Polyline/Radius/Trim/Multiple]: R</p> <p>Specify fillet radius &lt;0.0000&gt;: 25*Cancel*</p> <p>25</p> <p>Command:</p> <p>Command: Specify opposite corner or [Fence/WPolygon/CPolygon]:</p> <p>Command:</p> <p>FILLET</p> <p>Current settings: Mode = TRIM, Radius = 0.0000</p>	<p>Specify opposite corner: Specify opposite corner:</p> <p>No objects crossed by crossing window.</p> <p>Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]: *Cancel*</p> <p>Window Lasso Press Spacebar to cycle options</p> <p>Command:</p> <p>Command:</p> <p>Command:</p> <p>Command: <code>_trim</code></p> <p>Current settings: Projection=UCS, Edge=None</p> <p>Select cutting edges ... 3 found</p> <p>Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]:</p> <p>Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]:</p> <p>Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]: Specify opposite corner: Specify opposite corner: *Cancel*</p> <p>Command:</p> <p>Command:</p> <p>Command: <code>_fillet</code></p> <p>Current settings: Mode = TRIM, Radius = 30.0000</p> <p>Select first object or [Undo/Polyline/Radius/Trim/Multiple]: R</p> <p>Specify fillet radius &lt;30.0000&gt;: 30</p> <p>Select first object or [Undo/Polyline/Radius/Trim/Multiple]:</p> <p>Select second object or shift-select to apply corner or [Radius]:</p> <p>Command: <code>_.TILEMODE</code></p> <p>Enter new value for TILEMODE &lt;1&gt;: 0 Regenerating layout.</p> <p>Regenerating model - caching viewports.</p> <p>Command:</p> <p>Automatic save to</p> <p>C:\Users\bsee202134\appdata\local\temp\Drawing2_1_1_9986.sv</p> <p>\$ ...</p> <p>Command:</p> <p>Command:</p> <p>Command:</p> <p>Command:</p>
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### Task3:



### Procedure:

- Firstly I drew two circles
- Used fillet command
- Drawed a curve

### Commands:

0 found Select objects: Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]: Window Lasso Press Spacebar to cycle options Command: Command: Command: Command: Command: _trim Current settings: Projection=UCS, Edge=None Select cutting edges ... 7 found Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]: Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]:	Current settings: Projection=UCS, Edge=None Select cutting edges ... Select objects or <select all>: *Cancel* Command: Command: Command: _trim Current settings: Projection=UCS, Edge=None Select cutting edges ... Select objects or <select all>: *Cancel* Command: Command: _line Specify first point: Specify next point or [Undo]: Specify next point or [Undo]: *Cancel* Command:
---	---

Select object to trim or shift-select to extend or  
[Fence/Crossing/Project/Edge/eRase/Undo]:  
Select object to trim or shift-select to extend or  
[Fence/Crossing/Project/Edge/eRase/Undo]:  
Select object to trim or shift-select to extend or  
[Fence/Crossing/Project/Edge/eRase/Undo]:  
Command:  
Command:  
Command: \_trim  
Current settings: Projection=UCS, Edge=None  
Select cutting edges ...  
Select objects or <select all>: 1 found  
Select objects: 1 found, 2 total  
Select objects: 1 found, 3 total  
Select object to trim or shift-select to extend or  
[Fence/Crossing/Project/Edge/eRase/Undo]:  
\*Cancel\*  
Command:  
Command: \_trim  
Current settings: Projection=UCS, Edge=None  
Select cutting edges ...  
Select objects or <select all>: \*Cancel\*  
Command:  
Command: \_trim  
Current settings: Projection=UCS, Edge=None  
Select cutting edges ...  
Select objects or <select all>: Specify opposite  
corner:  
Invalid window specification.  
Specify opposite corner: Specify opposite corner:  
\*Cancel\*  
0 found  
Select objects: \*Cancel\*  
Command:  
Command:  
Command: \_line  
Specify first point:  
Specify next point or [Undo]:  
Specify next point or [Undo]: \*Cancel\*  
Command:  
Command:  
Command:  
Command: \_trim  
Current settings: Projection=UCS, Edge=None  
Select cutting edges ... 1 found  
Select object to trim or shift-select to extend or  
[Fence/Crossing/Project/Edge/eRase/Undo]:  
\*Cancel\*  
Command: \*Cancel\*  
Command: \*Cancel\*  
Command:  
Command:  
Command: \_undo Current settings: Auto = On,  
Control = All, Combine = Yes, Layer = Yes  
Enter the number of operations to undo or  
[Auto/Control/BEGIN/End/Mark/Back] <1>: 1 TRIM  
GROUP

Command:  
Command: \_trim  
Current settings: Projection=UCS, Edge=None  
Select cutting edges ...  
Select objects or <select all>: \*Cancel\*  
Command:  
Command:  
Command:  
Command:  
Command: \_trim  
Current settings: Projection=UCS, Edge=None  
Select cutting edges ... 2 found  
Select object to trim or shift-select to extend or  
[Fence/Crossing/Project/Edge/eRase/Undo]: \*Cancel\*  
Command:  
Command:  
Command:  
Command: \_trim  
Current settings: Projection=UCS, Edge=None  
Select cutting edges ... 1 found  
Select object to trim or shift-select to extend or  
[Fence/Crossing/Project/Edge/eRase/Undo]:  
Select object to trim or shift-select to extend or  
[Fence/Crossing/Project/Edge/eRase/Undo]:  
Select object to trim or shift-select to extend or  
[Fence/Crossing/Project/Edge/eRase/Undo]:  
Does not intersect with the cutting edge.  
Select object to trim or shift-select to extend or  
[Fence/Crossing/Project/Edge/eRase/Undo]: \*Cancel\*  
Command: Specify opposite corner or  
[Fence/WPolygon/CPolygon]:  
Command:  
Command:  
Command:  
Command: \_trim  
Current settings: Projection=UCS, Edge=None  
Select cutting edges ... 1 found  
Select object to trim or shift-select to extend or  
[Fence/Crossing/Project/Edge/eRase/Undo]:  
Select object to trim or shift-select to extend or  
[Fence/Crossing/Project/Edge/eRase/Undo]: \*Cancel\*  
Command:  
Command:  
Command:  
Command: \_trim  
Current settings: Projection=UCS, Edge=None  
Select cutting edges ...  
Select objects or <select all>: \*Cancel\*  
Command:  
Command:  
Command: \_arc  
Specify start point of arc or [Center]:  
Specify second point of arc or [Center/End]: \_e  
Specify end point of arc:  
Specify center point of arc (hold Ctrl to switch direction) or  
[Angle/Direction/Radius]: \_r  
Specify radius of arc (hold Ctrl to switch direction): 43  
Command:

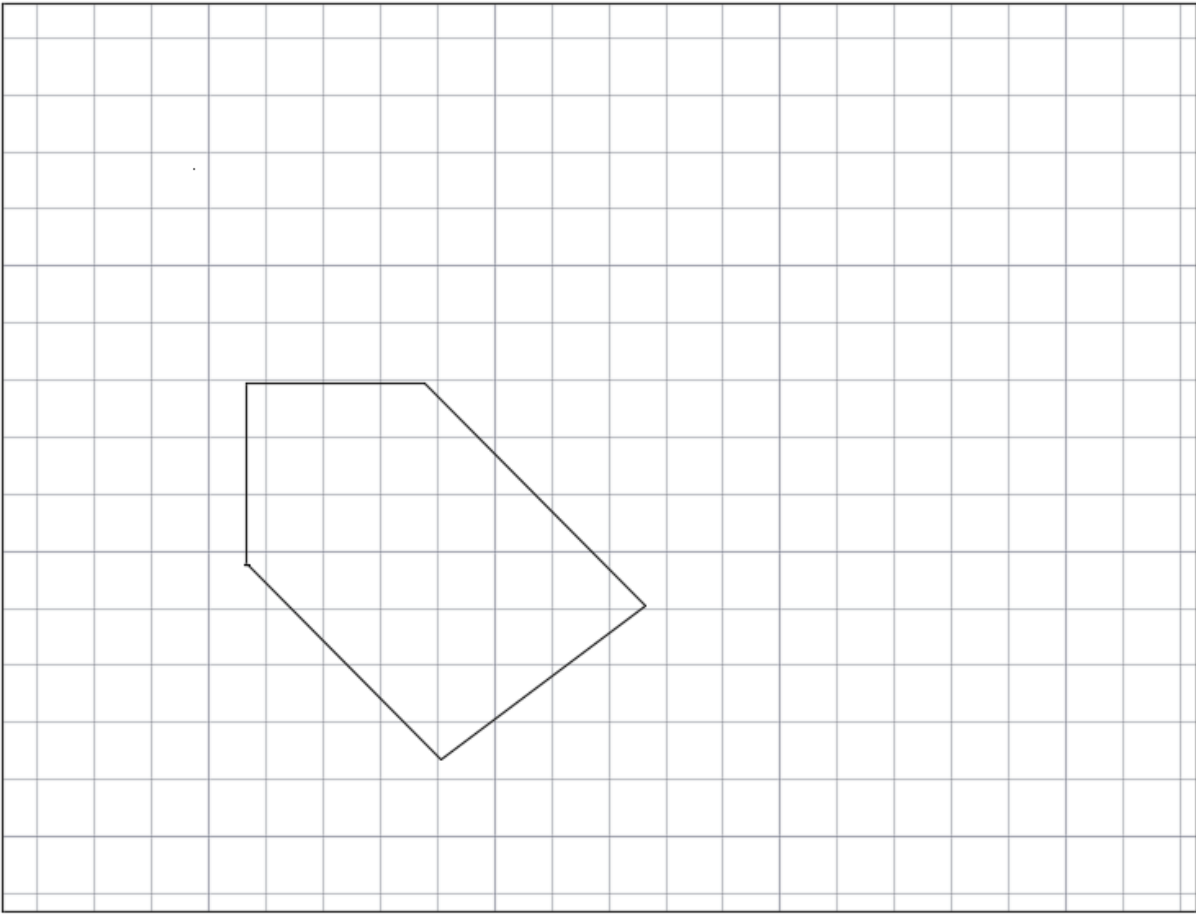
Command:  
Command:  
Command: `_.undo` Current settings: Auto = On,  
Control = All, Combine = Yes, Layer = Yes  
Enter the number of operations to undo or  
[Auto/Control/BEGIN/End/Mark/Back] <1>: 1 LINE  
GROUP  
Window Lasso Press Spacebar to cycle options  
Command:  
Command:  
Command: `_trim`  
Current settings: Projection=UCS, Edge=None  
Select cutting edges ... 7 found  
Select object to trim or shift-select to extend or  
[Fence/Crossing/Project/Edge/eRase/Undo]:  
\*Cancel\*  
Command:  
Command:  
Command: `_rotate`  
Current positive angle in UCS:  
ANGDIR=counterclockwise ANGBASE=0  
1 found  
Specify base point:  
Specify rotation angle or [Copy/Reference] <0>:  
Command:  
Command:  
Command:  
Command: `_move` 1 found  
Specify base point or [Displacement]  
<Displacement>:  
Specify second point or <use first point as  
displacement>:  
Command: <Ortho off>  
Command:  
Command:  
\*\* STRETCH \*\*  
Specify stretch point or [Base  
point/Copy/Undo/eXit]:  
Command:  
Command:  
Command: `_move` 1 found  
Specify base point or [Displacement]  
<Displacement>:  
Specify second point or <use first point as  
displacement>:  
Command:  
Command: Specify opposite corner or  
[Fence/WPolygon/CPolygon]:  
Invalid window specification.  
Specify opposite corner or  
[Fence/WPolygon/CPolygon]: Specify opposite  
corner or [Fence/WPolygon/CPolygon]:  
Invalid window specification.  
Specify opposite corner or  
[Fence/WPolygon/CPolygon]: Specify opposite  
corner or [Fence/WPolygon/CPolygon]:  
Invalid window specification.

Command:  
Command: \*Cancel\*  
Command: \*Cancel\*  
Command:  
Command: `_.erase` 1 found  
Command:  
Command: `_.erase` 1 found  
Command:  
Command: `_.erase` 1 found  
Command:  
Command: `_.erase` 1 found  
Command:  
Command:  
Command: `_arc`  
Specify start point of arc or [Center]:  
Specify second point of arc or [Center/End]: `_e`  
Specify end point of arc:  
Specify center point of arc (hold Ctrl to switch direction) or  
[Angle/Direction/Radius]: `_r`  
Specify radius of arc (hold Ctrl to switch direction): 43  
Command:  
Command: `_.erase` 1 found  
Command:  
Command:  
Command: `_line`  
Specify first point:  
Specify next point or [Undo]:  
Specify next point or [Undo]:  
Command:  
Command:  
Command: `_fillet`  
Current settings: Mode = TRIM, Radius = 43.0000  
Select first object or  
[Undo/Polyline/Radius/Trim/Multiple]: R  
Specify fillet radius <43.0000>: 15  
Select first object or  
[Undo/Polyline/Radius/Trim/Multiple]:  
Select second object or shift-select to apply corner or  
[Radius]:  
No valid fillet with radius 15.0000  
Command:  
Command: Specify opposite corner or  
[Fence/WPolygon/CPolygon]:  
Command:  
FILLET  
Current settings: Mode = TRIM, Radius = 15.0000  
Select first object or  
[Undo/Polyline/Radius/Trim/Multiple]: \*Cancel\*  
Command:  
Command: `_fillet`  
Current settings: Mode = TRIM, Radius = 15.0000  
Select first object or  
[Undo/Polyline/Radius/Trim/Multiple]: R  
Specify fillet radius <15.0000>: 15  
Select first object or  
[Undo/Polyline/Radius/Trim/Multiple]:

<p>Specify opposite corner or [Fence/WPolygon/CPolygon]: Specify opposite corner or [Fence/WPolygon/CPolygon]: Invalid window specification. Specify opposite corner or [Fence/WPolygon/CPolygon]: Specify opposite corner or [Fence/WPolygon/CPolygon]: *Cancel*</p> <p>Command: Command: _line Specify first point: *Cancel* Command: Command: _line Specify first point: Specify next point or [Undo]: Specify next point or [Undo]: *Cancel* Command: Command: Command: _trim Current settings: Projection=UCS, Edge=None Select cutting edges ... Select objects or &lt;select all&gt;: 1 found Select objects: *Cancel* Window Lasso Press Spacebar to cycle options Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: Command: Command: Automatic save to C:\Users\bsee202134\appdata\local\temp\Drawing3_1_1_5793.sv\$ ... Command: Command: Command: Command: _trim Current settings: Projection=UCS, Edge=None Select cutting edges ... 6 found Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]: Specify opposite corner: Specify opposite corner: *Cancel* Command: Command: Command: Command: _trim Current settings: Projection=UCS, Edge=None Select cutting edges ... 1 found Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]: Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]: *Cancel* Command: Command: Command: _trim</p>	<p>Select second object or shift-select to apply corner or [Radius]: No valid fillet with radius 15.0000 Command: FILLET Current settings: Mode = TRIM, Radius = 15.0000 Select first object or [Undo/Polyline/Radius/Trim/Multiple]: Command: Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: Invalid window specification. Specify opposite corner or [Fence/WPolygon/CPolygon]: Specify opposite corner or [Fence/WPolygon/CPolygon]: Invalid window specification. Specify opposite corner or [Fence/WPolygon/CPolygon]: Specify opposite corner or [Fence/WPolygon/CPolygon]: Invalid window specification. Specify opposite corner or [Fence/WPolygon/CPolygon]: Specify opposite corner or [Fence/WPolygon/CPolygon]: *Cancel* Command: *Cancel* Command: Command: Command: _fillet Current settings: Mode = TRIM, Radius = 15.0000 Select first object or [Undo/Polyline/Radius/Trim/Multiple]: R Specify fillet radius &lt;15.0000&gt;: 10 Select first object or [Undo/Polyline/Radius/Trim/Multiple]: Select second object or shift-select to apply corner or [Radius]: Command: _TILEMODE Enter new value for TILEMODE &lt;1&gt;: 0 Regenerating layout. Regenerating model - caching viewports. Command: Automatic save to C:\Users\bsee202134\appdata\local\temp\Drawing3_1_1_5793.sv\$ ... Command: Window Lasso Press Spacebar to cycle options</p>
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Task4:



Procedure:

I drew five lines and joined

Commands:

Commands: egenerating model. AutoCAD menu utilities loaded. AutoCAD Electrical menu utilities loaded. Command: Command: Command: Command: Regenerating model. ** MOVE AND ALIGN ** Specify origin point or align to face, surface, or mesh: Command: Command: Command: _line Specify first point: Specify next point or [Undo]: <Ortho on> 40 Specify next point or [Undo]: Command: Command: Command: _line Specify first point:	Specify next point or [Arc/Close/Halfwidth/Length/Undo/Width]: 19 Specify next point or [Arc/Close/Halfwidth/Length/Undo/Width]: Command: Command: _erase 1 found Command: Command: Command: _dimlinear Specify first extension line origin or <select object>: Select object to dimension: Specify dimension line location or [Mtext/Text/Angle/Horizontal/Vertical/Rotated]: Command: Command: DIMLINEAR Specify first extension line origin or <select object>: Specify second extension line origin: Specify dimension line location or [Mtext/Text/Angle/Horizontal/Vertical/Rotated]:
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Specify next point or [Undo]:  
 Command:  
 Command: \_line  
 Specify first point: <Ortho off>  
 Specify next point or [Undo]: 60  
 Specify next point or [Undo]:  
 Command:  
 Command: \_erase 1 found  
 Command:  
 Command:  
 Command: \_line  
 Specify first point:  
 Specify next point or [Undo]: 60  
 Specify next point or [Undo]:  
 Command:  
 Command:  
 Command: \_pline  
 Specify start point:  
 Current line-width is 0.0000  
 Specify next point or  
 [Arc/Halfwidth/Length/Undo/Width]: 10

Specify next point or [Undo]:  
 Command:  
 Command:  
 Command: \_line  
 Specify first point:  
 Specify next point or [Undo]:  
 Specify next point or [Undo]:  
 Command:  
 Command: Specify opposite corner or  
 [Fence/WPolygon/CPolygon]:  
 Command:  
 Command:  
 Command: \_line  
 Specify first point:  
 Specify next point or [Undo]:  
 Command:  
 Command:  
 Command: \_dim  
 Select objects or specify first extension line origin or  
 [Angular/Baseline/Continue/Ordinate/align/Distribute  
 /Layer/Undo]:  
 Select line to specify extension lines origin:  
 Specify dimension line location or second line for  
 angle [Mtext/Text/text angle/Undo]:  
 Select objects or specify first extension line origin or  
 [Angular/Baseline/Continue/Ordinate/align/Distribute  
 /Layer/Undo]:  
 Select objects or specify first extension line origin or  
 [Angular/Baseline/Continue/Ordinate/align/Distribute  
 /Layer/Undo]:\*Cancel\*  
 Command:  
 Command: \_undo Current settings: Auto = On,  
 Control = All, Combine = Yes, Layer = Yes

Dimension text = 0.0000  
 Command:  
 Command: \_erase 1 found  
 Dimension disassociated.  
 Command:  
 Command:  
 Command: \_line  
 Specify first point:  
 Specify next point or [Undo]: 60  
 Specify next point or [Undo]: \*Cancel\*  
 \*Cancel\*  
 Command:  
 Command:  
 Command: \_line  
 Specify first point:  
 Specify next point or [Undo]: 60  
 Specify next point or [Undo]:  
 Command:  
 Command:  
 Command: \_line  
 Specify first point:  
 Specify next point or [Undo]: 60  
 Specify next point or [Undo]:  
 Command:  
 Command:  
 Command: \_line  
 Specify first point:  
 Specify next point or [Undo]:  
 Specify next point or [Close/Undo]:  
 Command:  
 LINE  
 Specify first point:  
 Specify next point or [Undo]: \*Cancel\*  
 Command:  
 Command: \_erase 1 found  
 Command:  
 Command: \_erase 1 found  
 Command:  
 Command:  
 Command: \_line  
 Specify first point:  
 Specify next point or [Undo]:  
 Specify next point or [Undo]:  
 Specify next point or [Close/Undo]: \*Cancel\*  
 \*Cancel\*  
 Command: \*Cancel\*  
 Command:  
 Command: \_erase 1 found  
 Command:  
 Command: \_erase 1 found  
 Command:  
 Command:  
 Command: \_line  
 Specify first point:  
 Specify next point or [Undo]:  
 Specify next point or [Undo]:  
 Command:  
 Command:  
 Command:  
 Command: \_trim  
 Current settings: Projection=UCS, Edge=None  
 Select cutting edges ... 1 found

<p>Enter the number of operations to undo or [Auto/Control/BEGIN/End/Mark/Back] &lt;1&gt;: 1 DIM GROUP</p> <p>Command:</p> <p>Command:</p> <p>Command: _line</p> <p>Specify first point:</p> <p>Specify next point or [Undo]: 40</p> <p>Specify next point or [Undo]:</p> <p>Command:</p> <p>Command:</p> <p>LINE</p> <p>Specify first point:</p> <p>Specify next point or [Undo]: Zero length line created at (111.8270, 46.1086, 0.0000)</p> <p>Specify next point or [Undo]:</p> <p>Specify next point or [Close/Undo]:</p> <p>Specify next point or [Close/Undo]:</p> <p>Command:</p> <p>Command: _erase 1 found</p> <p>Command:</p> <p>Command: _erase 1 found</p> <p>Command:</p> <p>Command: _erase 1 found</p> <p>Command:</p> <p>Command: Specify opposite corner or [Fence/WPolygon/CPolygon]:</p> <p>Command: _erase 1 found</p> <p>Command:</p> <p>Command:</p> <p>Command: _line</p> <p>Specify first point:</p> <p>Specify next point or [Undo]: *Cancel*</p> <p>Command:</p> <p>Command:</p> <p>Command: _erase 2 found</p> <p>Command:</p> <p>** MOVE AND ALIGN **</p> <p>Specify origin point or align to face, surface, or mesh:</p> <p>Command: &lt;Ortho off&gt;</p> <p>Command:</p> <p>** MOVE AND ALIGN **</p> <p>Specify origin point or align to face, surface, or mesh:</p> <p>Command:</p> <p>** MOVE AND ALIGN **</p> <p>Specify origin point or align to face, surface, or mesh:</p> <p>Command:</p> <p>Command:</p> <p>Command: _line</p> <p>Specify first point:</p> <p>Specify next point or [Undo]: &lt;Ortho on&gt; 60</p> <p>Specify next point or [Undo]:</p> <p>Command:</p> <p>Command:</p> <p>Command: _line</p> <p>Specify first point: *Cancel*</p> <p>Command:</p>	<p>Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]: Specify opposite corner: Specify opposite corner:</p> <p>Select object to trim or shift-select to extend or [Fence/Crossing/Project/Edge/eRase/Undo]:</p> <p>Command:</p> <p>Command:</p> <p>Command: _trim</p> <p>Current settings: Projection=UCS, Edge=None</p> <p>Select cutting edges ...</p> <p>Select objects or &lt;select all&gt;: Specify opposite corner: Invalid window specification.</p> <p>Specify opposite corner: Specify opposite corner: Invalid window specification.</p> <p>Specify opposite corner: Specify opposite corner: *Cancel*</p> <p>0 found</p> <p>Window Lasso Press Spacebar to cycle options6 found</p> <p>1 was not a valid edge or selection method.</p> <p>Select objects: 1 found, 6 total</p> <p>Select objects: *Cancel*</p> <p>Command:</p> <p>Command: _trim</p> <p>Current settings: Projection=UCS, Edge=None</p> <p>Select cutting edges ...</p> <p>Select objects or &lt;select all&gt;: 1 found</p> <p>Select objects: *Cancel*</p> <p>Command:</p> <p>Command: _trim</p> <p>Current settings: Projection=UCS, Edge=None</p> <p>Select cutting edges ...</p> <p>Select objects or &lt;select all&gt;: 1 found</p> <p>Select objects: *Cancel*</p> <p>Command:</p> <p>Command: _erase 1 found</p> <p>Command:</p> <p>Command: _erase 1 found</p> <p>Command:</p> <p>Command:</p> <p>Command: _line</p> <p>Specify first point:</p> <p>Specify next point or [Undo]:</p> <p>Specify next point or [Undo]:</p> <p>Command:</p> <p>Command: _erase 1 found</p> <p>Command:</p> <p>Command:</p> <p>Command: _line</p> <p>Specify first point:</p> <p>Specify next point or [Undo]:</p> <p>Specify next point or [Undo]:</p> <p>Command:</p> <p>Automatic save to</p> <p>C:\Users\bsee202134\appdata\local\temp\Drawing4_1_1_5500.sv\$ ...</p> <p>Command:</p> <p>Command: _TILEMODE</p>
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Command: _line Specify first point: Specify next point or [Undo]: 40 Specify next point or [Undo]: Command: Command: Command: _line Specify first point: Specify next point or [Undo]: Specify next point or [Undo]: Automatic save to C:\Users\bsee202134\AppData\Local\Temp\Drawing4_1_1_5500.sv\$ ... Command: Command:	Enter new value for TILEMODE <1>: 0 Regenerating layout. Regenerating model - caching viewports.
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**THE END**

**Engineering Drawing Lab 06****Method of Evaluation:** Lab Report and in-lab marking by instructors.**Measured Learning Outcomes****CLO1:** Ability to read basic engineering drawings problems.**CLO3:** Reproduce 2-D and 3-D sketches using AutoCAD by applying engineering drawing principles.

	Excellent (10)	Good (9 to 7)	Satisfactory (6 to 4)	Unsatisfactory (3 to 1)	Poor (0)	Marks Obtained
Assignment (CLO1)	Required document filled-in neatly with meaningful answers to all questions, proper grammar and punctuations with proper conclusion drawn	Required document filled-in neatly with meaningful answers to most questions and proper conclusions drawn with some grammar mistakes	Some correct/meaningful answers and conclusions with some irrelevant ones. Some parts of the document not neat or some grammar mistakes.	Answers not understandable/ not relevant to questions. Conclusions not based on results. Illegible writing with no proper grammar/punctuation	Report/Hand out Not submitted	
Task Completion (CLO3)	All Tasks were completed successfully in the time of the lab	Most of the tasks were completed in the given time of the lab	Some of the tasks were completed in the given lab time	Very few tasks were performed and completed in given lab time	Lab tasks weren't performed at all	
Total						