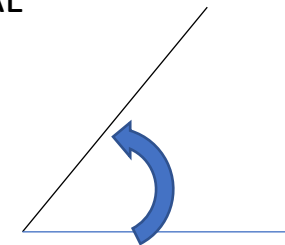


LINE COMMAND (SHORTCUT : L ←)

- TO DRAW A LINE OF KNOWN START & END POINT
 - **L (Enter)**
 - Specify Start Point (Click on the point from where the line will be started)
 - Specify End Point (Click on the point where the line will end)
- TO DRAW A LINE OF KNOWN LENGTH
 - **L (Enter)**
 - Specify Start Point (Click on the point from where the line will be started)
 - Provide length of the line (The line will be drawn towards the cursor)
 - **Enter**
- TO DRAW A VERTICAL/ HORIZONTAL LINE OF KNOWN LENGTH
 - Follow the above mentioned steps by keeping ORTHO mode ON
 - ORTHO mode may be made OFF/ON by pressing F8 Key of the key board
 - ORTHO is used to draw/copy/move any object in vertical / horizontal direction only.
- TO DRAW A LINE OF KNOWN LENGTH AND OF KNOWN INCLINATION WITH HORIZONTAL
 - L (Enter)
 - Specify Start Point (Click on the point from where the line will be started)
 - Provide length and angle by typing : **@ (Length of line) < (inclination of the line)**
 - Enter
 - *The inclination shall be measured from the right hand side of the object in anticlockwise direction*



• RECTANGLE COMMAND (SHORTCUT : REC ←)

- TO DRAW A RECTANGLE OF KNOWN LENGTH & WIDTH
 - **REC (Enter)**
 - Specify First Corner Point (Click on the point from where the rectangle will start)
 - Provide dimensions of rectangle by entering : @ (**Horizontal dimension**) (**comma**) (**Vertical Dimension**)
 - **Enter**

• CIRCLE COMMAND (SHORTCUT : C ←)

- TO DRAW A CIRCLE OF KNOWN RADIUS
 - **C (Enter)**
 - Specify Centre Point (Click on the point which will be centre of circle)
 - Specify radius of Circle (Type the radius)
 - **Enter**
- TO DRAW A CIRCLE OF KNOWN DIAMETER
 - **C (Enter)**
 - Specify Centre Point (Click on the point which will be centre of circle)
 - **D (Enter)** *[To activate the Diameter option]*
 - Specify diameter of Circle (Type the diameter)
 - **Enter**

• POLY LINE COMMAND (SHORTCUT : PL ←)

- TO DRAW A LINE OF SPECIFIED THICKNESS
 - **PL (Enter)**
 - Specify start Point (Click on the point from where the line will start)
 - **W (enter)** (to enter width of line)
 - Specify starting width and press **Enter**
 - Specify ending width and press **Enter**
 - Specify end point of line

• POLYGON COMMAND (SHORTCUT : POL ←)

- TO DRAW A POLYGON, WHOSE DIMENSION OF SIDES ARE KNOWN
 - **POL (Enter)**
 - Enter no of sides of polygon
 - **E (Enter)** *[To activate the edge option]*
 - Specify start point of a edge
 - Specify second point of edge (provide the dimension of a side by adjusting the cursor)
 - **Enter**

• OFFSET COMMAND (SHORTCUT : O ←)

- TO DRAW A PARALLEL LINE / OBJECT OF A EXISTING OBJECT AT A SPECIFIED DISTANCE
 - **O (Enter)**
 - Specify offset distance (the distance between two parallel object)
 - **E (Enter)**
 - Select object to offset (select the source object whose parallel object to be drawn)
 - Specify point on side to offset (click on upper/lower or left/right side of the object. Parallel object will be drawn on that side)
 - **Esc** (to exit the command)

• ROTATE COMMAND (SHORTCUT : RO ←)

- TO ROTATE ANY OBJECT
 - **RO (Enter)**
 - Select objects (select the objects which needs to be rotated)
 - **Right Click / Enter**
 - Specify base point (This will be the point based on which the object will be rotated)
 - Specify rotation angle (type the angle, measured from right hand side in anticlockwise direction)

• COPY COMMAND (SHORTCUT : CO ←)

- TO COPY AN EXISTING OBJECT
 - **CO (Enter)**
 - Select Objects (select the object which needs to be copied)
 - **Right Click / Enter**
 - Specify base point (Click at the point of object on which copied object will rest)
 - Specify second point / distance (the point at which duplicate object will rest)
 - **Esc** (to exit the command)

• MOVE COMMAND (SHORTCUT : M ←)

- TO MOVE AN EXISTING OBJECT
 - **M (Enter)**
 - Select Objects (select the object which needs to be copied)
 - **Right Click / Enter**
 - Specify base point (Click at the point of object on which moved object will rest)
 - Specify second point / distance (the point at which moved object will rest)

• MIRROR COMMAND (SHORTCUT : MI ←)

- TO DRAW A MIRRORED OBJECT OF AN EXISTING OBJECT
 - **MI (Enter)**
 - Select Objects (select the source object whose mirrored object will be created)
 - **Right Click / Enter**
 - Specify first point of mirror line

[A mirror line can be described by two points. So we need to specify first & second point of mirror line. Object will be created in refernce of that line]

- Specify second point of mirror line
- Erase Source object (Enter **Y** to erase the source object / **N** to keep the the source object)

• TRIM COMMAND (SHORTCUT : TR ←)

- TO CUT A LINE / OBJECT IN REFERENCE TO A CUTTING LINE
 - **TR (Enter)**
 - Select Objects (select the cutting line)
 - **Right Click / Enter**
 - Select the object to trim (click on the part of the object which needs to be trimmed / deleted)
 - **Esc** (to exit the command)

• EXTEND COMMAND (SHORTCUT : EX ←)

- TO EXTEND A LINE UP TO A REFERENCE LINE
 - **EX (Enter)**
 - Select Objects (select the reference line up to which a line will be extended)
 - **Right Click / Enter**
 - Select the object to extend (click on the part of the line which needs to be extended)
 - **Esc** (to exit the command)

• FILLET COMMAND (SHORTCUT : F ←)

- TO EXTEND TWO LINES UP TO THEIR INTERSECTION POINT
 - **F (Enter)**
 - Select First object (select the first line)
 - Select second object (select the second line)
- TO EXTEND TWO LINES UP TO THEIR INTERSECTION POINT AND ADD CURVE AT THE INTERSECTION POINT
 - **F (Enter)**
 - **R (Enter)** [to put radius of curve]
 - Select First object (select the first line)
 - Select second object (select the second line)

- MULTILINE TEXT(SHORTCUT : MT ←)

- TO WRITE MULTILINE TEXT

- **MT (Enter)**
- Specify first corner point
- Specify second corner point
- *Draw a window by specifying two corner points. After that most of the function of MS word will be shown at tool bar. By using them we can write and edit texts as per requirement.*

- SINGLE LINE TEXT(SHORTCUT : DT ←)

- TO WRITE SINGLE LINE TEXT

- **DT (Enter)**
- Specify start point
- Specify height of text
- Specify rotation angle of text (put 0 to draw horizontal text)
- Esc to exit command.

- DISTANCE COMMAND (SHORTCUT : DI ←)

- TO VIEW DISTANCE BETWEEN TWO POINTS

- **DI (Enter)**
- Specify first point
- Specify second point

- ERASE COMMAND (SHORTCUT : E ←)

- TO ERASE ANY OBJECT

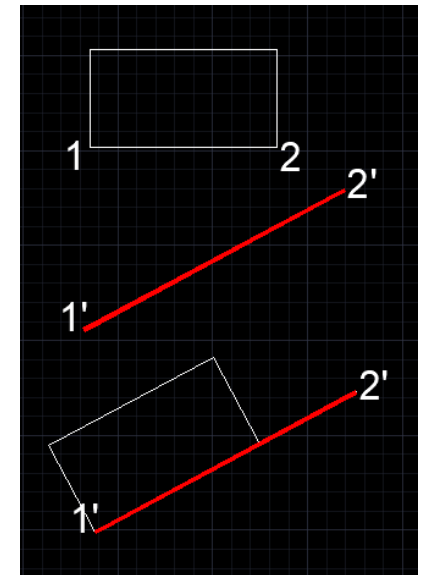
- Select object needs to be erased and Type **E** and then press **Enter**.
- **OR** Select the object and press **Delete** key of keyboard.

• DIVIDE (SHORTCUT : DIV ←)

- TO DIVIDE ANY LINE/ OBJECT IN EQUAL SEGMENTS
 - **DIV (Enter)**
 - Select object to divide
 - Specify no. of segments
 - **Enter**
 - Type **PTYPE** and press **Enter**
 - 'Point Style' window will open
 - Select any point style other than point/blank and click on **OK**
 - Now different segments will be marked with selected point type.

• ALIGN (SHORTCUT : AL ←)

- TO Align any object with some other object
 - **AL (Enter)**
 - Select objects (select the object which will be aligned with other object)
 - Right Click
 - Specify first source point (say point 1 of adjacent image)
 - Specify first destination point (point 1' of the image)
 - Specify second source point (point 2 of image)
 - Specify second destination point (point 2' of image)
 - Enter
 - Scale Source objects **Yes** or **No** (yes to change the size of original object & No to keep the size unchanged)



In the above image, the rectangle has been aligned with the red line

• ARC COMMAND (SHORTCUT : A ←)

- TO DRAW AN ARC OF KNOWN START,END & CENTER POINTS
 - **A (Enter)**
 - Specify start point
 - **C (Enter)**
 - Specify centre point
 - Specify end point
 - *The arc will be created in anti-clock wise direction*
- TO DRAW AN ARC OF KNOWN START, CENTER & ARC LENGTH
 - **A (Enter)**
 - Specify start point
 - **C (Enter)**
 - Specify centre point
 - Specify end point (click on any arbitrary point)
 - Type '**LENGTHEN**' and press **Enter**
 - Type '**T**' and then Press **Enter** (this will activate Total option of lengthen command)
 - Specify total curve/arc length and press **Enter**
 - Select the arc. (if we click on upper portion of Arc the arc will adjust its length from Top & if we click at lower portion the Arc will adjust its length from bottom. The arc will change its length to achieve the total curve length as per the input)

• DIMENSION - LINEAR (SHORTCUT : DIMLINEAR ←)

Under Annotation head at Toolbar different icons for dimensions are available

• TO DRAW VERTICAL / HORIZONTAL DIMENSION OF ANY OBJECT

- **DIMLINEAR (Enter)**
- Specify first point
- Specify second point
- Place the dimension by adjusting the cursor.

• DIMENSION - ALIGNED (SHORTCUT : DIMALIGNED ←)

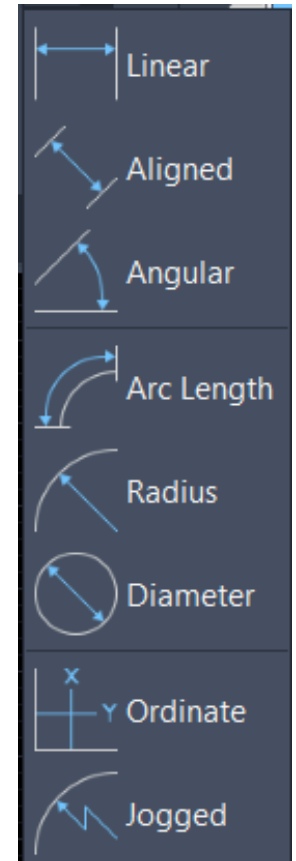
• TO DRAW DIMENSION PARALLEL TO ANY OBJECT

- **DIMALIGNED (Enter)**
- Specify first point
- Specify second point
- Place the dimension by adjusting the cursor.

• DIMENSION - ANGULAR (SHORTCUT : DIMANG ←)

• TO DRAW DIMENSION INDICATING ANGLES BETWEEN TWO LINES

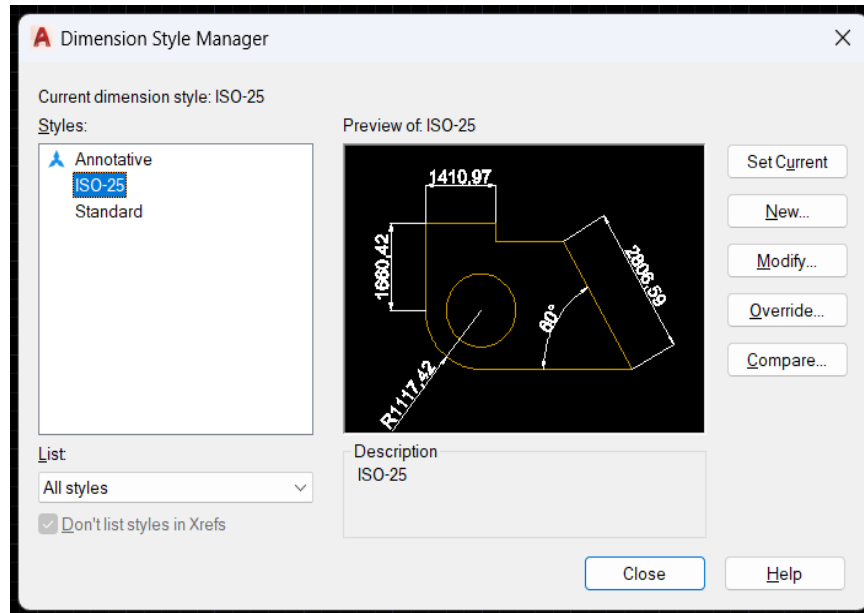
- **DIMANG (Enter)**
- Select first object
- Select second object
- Adjust the cursor to place the object at desired position.



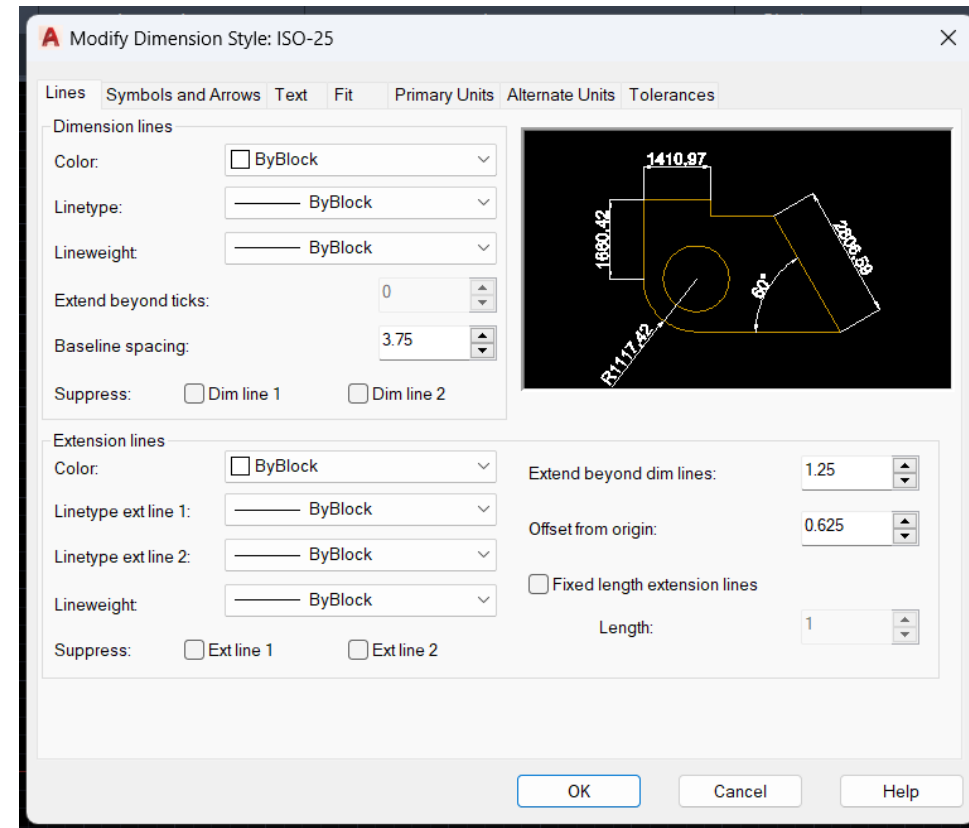
• DIMENSION STYLE MANAGER (SHORTCUT : D ←)

- TO EDIT PROPERTIES OF DIMENSION LIKE TEXT SIZE, TEXT STYLE, ARROW SIZE, ARROW STYLE, DIMLINE TYPE, COLOUR

- **D (Enter)**
- Dimension Style Manager window will open
- Select any style and Click on **Modify**



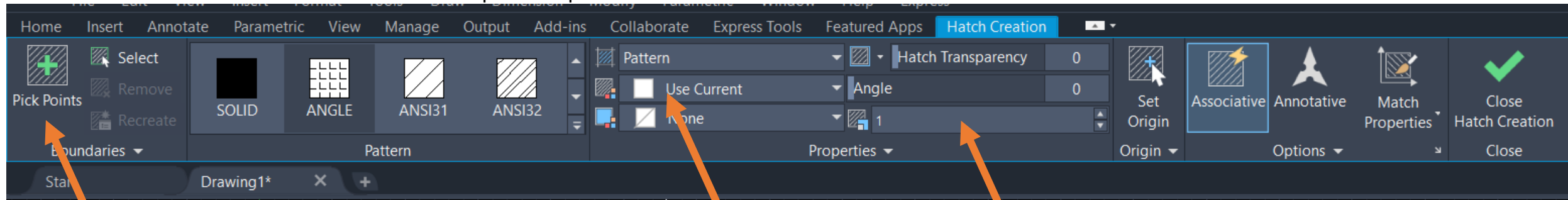
- Do necessary changes
- Click **OK** & then **Close**



By clicking in different Tabs at top ribbon we can modify dimensions as per requirement. Effects of change will be visible at the adjacent figure

• HATCH COMMAND (SHORTCUT : H ←)

- TO DRAW HATCH INSIDE CLOSED BOUNDARY
 - **H (Enter)**
 - Hatch creation window will open at top tool bar.



Pick Point

Hatch Colour

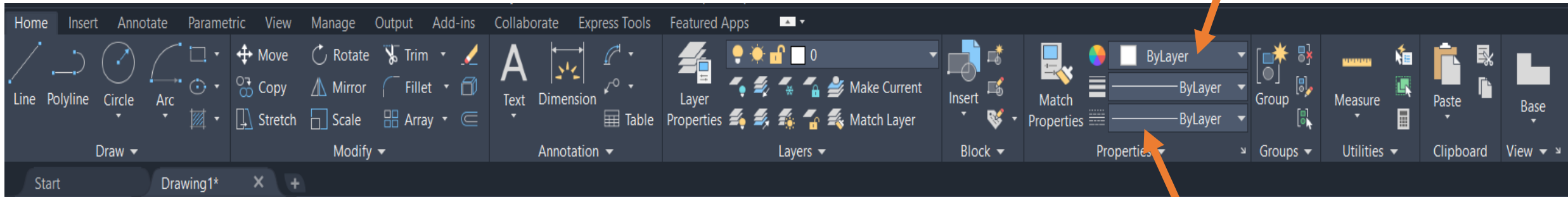
Hatch Scale

- click at **Pick points** under *Boundary*
- Select desired pattern under *Pattern*
- Select hatch colour under *Properties*.
- Click inside a closed boundary where hatch needs to be created.
- If the created hatch looks like a solid fill, increase the **scale** under *Properties* to adjust the pattern and press **enter** to see the effect.
- Press Esc / Close Hatch Creation to exit the command.

• CHANGE LINETYPE , COLOUR

• TO CHANGE LINE TYPE

- **LINETYPE (Enter)**
- *Line Type Manager* window will open.
- Click on **Load**
- *Load or Reload Linetypes* window will open
- Select desired line type from the list then click **OK**.
- Again Click **OK** on *Line Type Manager* window.
- Now select the object whose line type needs to be changed.
- Go to *Properties* tab at top toolbar
- Under *linetype* menu select desired line type from the list by clicking the dropdown menu.



• TO CHANGE COLOUR OF ANY OBJECT

- Select the object whose colour needs to be changed.
- Go to *Properties* tab at top toolbar
- Under **OBJECT COLOR** menu select desired Colour by clicking the dropdown menu and click **OK**

POLYLINE COMMAND (SHORTCUT : PL ←)

- TO DRAW A POLYLINE OF KNOWN START & END POINT
 - **PL (Enter)**
 - Specify Start Point (Click on the point from where the polyline will be started or enter the start point co-ordinate)
 - Specify End Point (Click on the point where the polyline will end or enter the end point co-ordinate)
 - NOTE: For Absolute co-ordinate system (#x,y) and for Relative co-ordinate system (@x,y)

- TO DRAW AN ARC USING POLYLINE COMMAND

- **PL (Enter)**
- Specify Start Point (Click on the point from where the line will be started)

PLINE Specify next point or [Arc Halfwidth Length Undo Width]:

- **A (Enter)** or Click on Arc

Specify endpoint of arc (hold Ctrl to switch direction) or

↻ **PLINE** [Angle CEnter Direction Halfwidth Line Radius Second pt Undo Width]:

- Specify End Point of arc

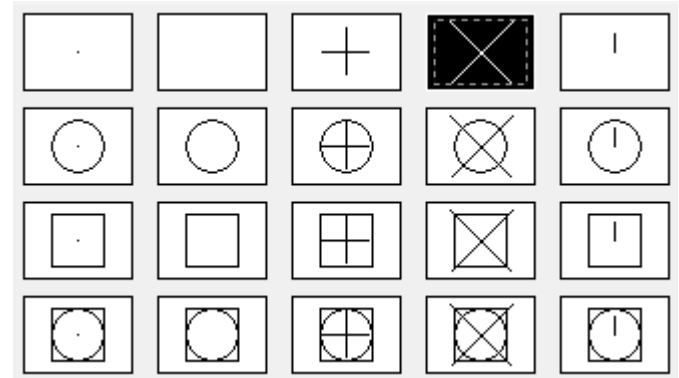
- TO DRAW AN ARROW USING POLYLINE COMMAND

- **PL (Enter)**
- Specify Start Point (Click on the point from where the line will be started)
- **PLINE** Specify next point or [**Arc** **Halfwidth** **Length** **Undo** **Width** :
- **W (Enter)** or click on Width
- Specify starting width and press Enter than specify Ending width and press Enter.
- Draw a polyline of uniform width (Arrow Shaft)
- **W (Enter)** or click on Width [To change the width]
- Specify starting width (higher than above width) and press Enter than specify Ending width(0) and press Enter.
- Draw a polyline of gradually decreasing width (Arrow Head)



POINTS COMMAND (SHORTCUT : PO ←)

- **PO (Enter)**
- Click where you want to start a point or Enter the co-ordinate of that point.
- **PT (Enter)** [To change the point type]
- Select the suitable point style and press OK



SCALE COMMAND (SHORTCUT : SC ←)

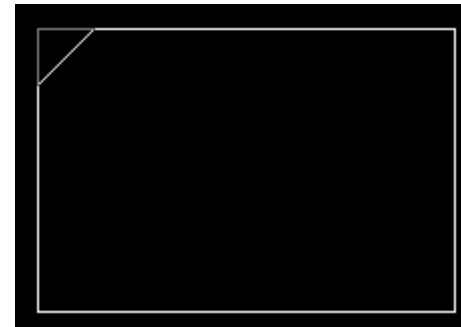
- **SC (Enter)**
- Select object and press Enter
- Select base point
- Enter the Scale factor

CHAMFER COMMAND (SHORTCUT : CHA ←)

- **CHA (Enter)**

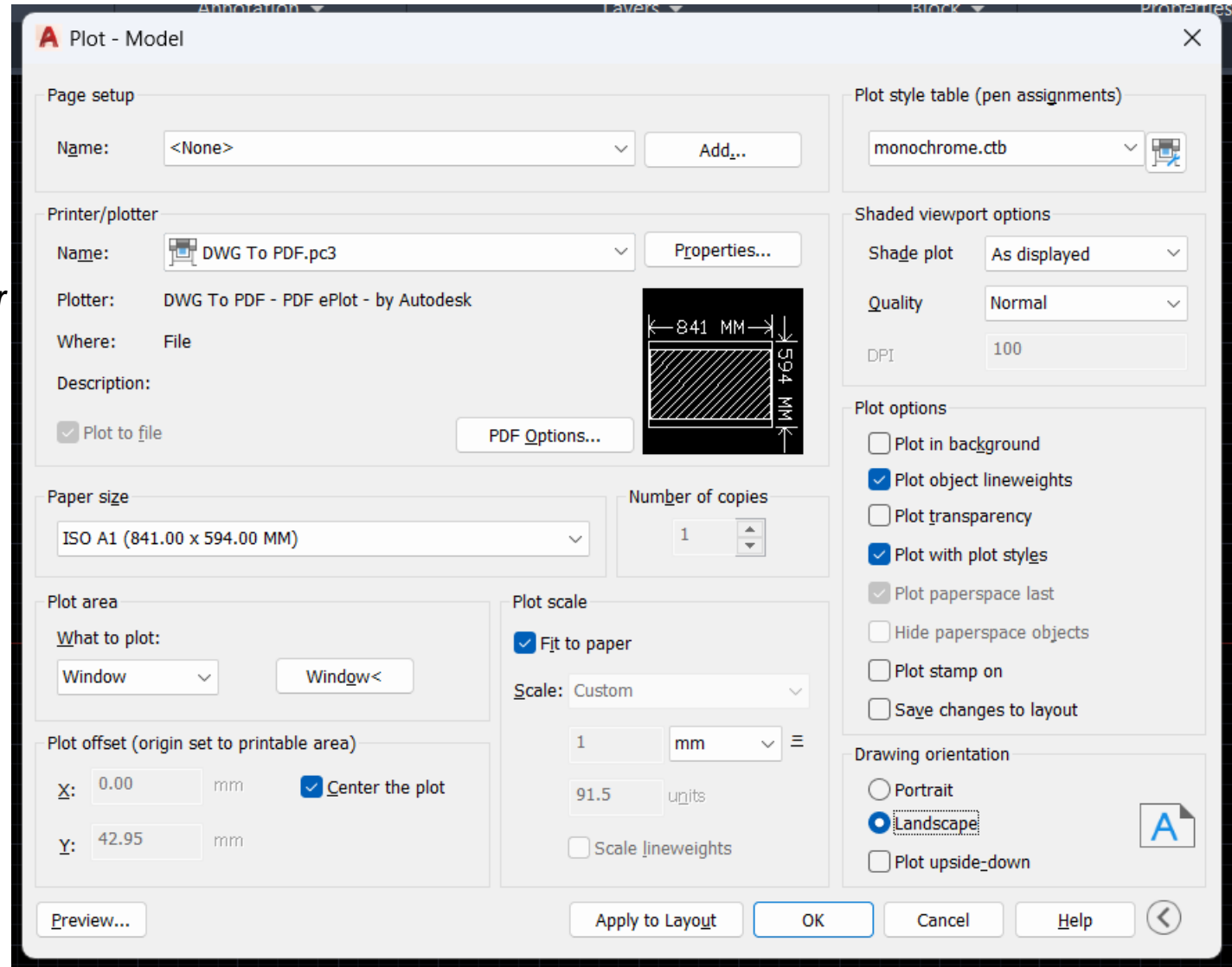
CHAMFER Select first line or [**Undo** **Polyline** **Distance** **Angle** **Trim** **mEthod** **Multiple**]

- D Enter or click on Distance
- Specify first chamfer distance and press enter
- Specify Second chamfer distance and press enter
- Click on first side and then second side.



• PRINT/ PLOT DRAWING (SHORTCUT : Ctrl+P)

- TO PRINT OR PLOT ANY DRAWING
 - **Ctrl+P**
 - Plot window will open
 - Select '**DWG To PDF.pc3**' from dropdown menu Under **Printer/Plotter** head to convert the drawing in PDF format.
 - Select **ISO A1** from dropdown menu under **Paper size** head.
 - Select Window under **Plot Area**.
 - Draw a rectangular window by selecting the corners of border rectangle of the drawing. The drawings within this window will be printed.
 - Check the boxes beside **Fit to Paper** & **Center the Plot**
 - Select '**monochrome.ctb**' under **Plot Style Table**
 - Select **Drawing Orientation** as Landscape
 - Click OK or See Preview
 - Save the PDF file at desired location.
 - *Monochrome.ctb prints entire drawing in Black.*
To make colour print select acad.ctb



- TIPS & TRICKS

- SELECTION OF ANY OBJECT

- We can select a single object by clicking on that object.
- Multiple objects can be selected together by selection window.
- Selection window are of two types 'green selection window' & 'blue selection window'
- Blue selection window will select any object if the object is fully covered with the window. If the window partly covers any object, it will not be selected.
- Green selection window selects all the objects, whether fully covered or partly covered with the window.
- Rectangular Blue selection window will be active if we click and move the cursor towards bottom of screen and Rectangular Green selection window will be active in opposite direction
- By continuously pressing the left mouse button and moving the cursor, we can create selection window of irregular shape

- ZOOM

- We can use scroll button of mouse to Zoom in/Zoom Out.
- By pressing the scroll button we can move the screen to adjust as per convenience.
- To view all the objects drawn in a file, type **Z enter then A enter (ZOOM ALL)**

- OSNAP

- Turn the OSNAP on. OSNAP may be made ON / OFF by pressing F3 key.
- OSNAP helps to better detect the endpoints/midpoints/center etc. of any object.
- Green square box at any object denotes end point and green triangle denotes midpoint of any object.
- Always keep the snapmode OFF. These options are available at bottom ribbon of the screen.

