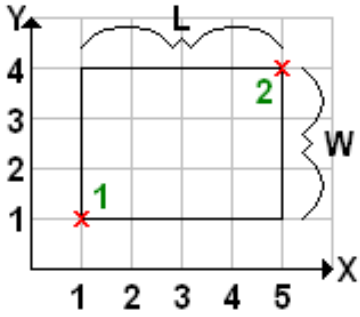
ENG103 – Computer Aided Design
Lecture Set IV

RECTANGLE Tool Command

The command for rectangle is '**RECTANGLE**', '**RECTANG**' or '**REC**'. There are three main methods for drawing a rectangle (i) Diagonal (Standard) Method, (ii) Area Method and (iii) Dimension Method.



(i) REC↵
- 1,1↵ ← First Point
- 4,3↵ ← Diagonally opposite second point

(ii) REC↵
- 1,1↵ ← First Point
- A↵ ← Area Method is chosen
- 12↵ ← Area of rectangle
- L↵ (or W) ← Either Length or Width is chosen
- 4↵ ← Length (Width Automatically Calculated)

(iii) REC↵
- 1,1↵ ← First Point
- D↵ ← Dimension Method is chosen
- 4↵ ← Length is determined
- 3↵ ← Width is determined
- 1,1↵ ← Second point just determines the placement of rectangle

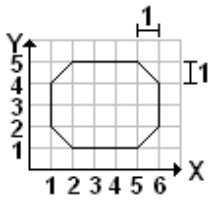


It is possible to apply 3 different styles in rectangles (in 2D) by changing the values of Chamfer, Fillet and Width.

Chamfer	: Creates fractures in corners.
Fillet	: Rounds corners as a ¼ of a circle.
Width	: line width of rectangle can be determined

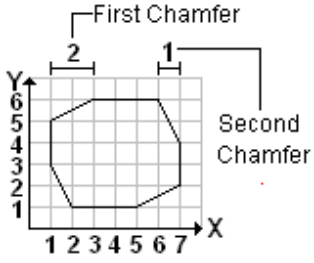
(i) a. Chamfer with equal distances

REC↵
- C↵ ← Chamfer will be applied
- 1↵ ← First chamfer distance
- 1↵ ← Second chamfer distance
- 1,1↵ ← First Point
- #6,5 **OR** 5,4 ← Diagonally opposite second point



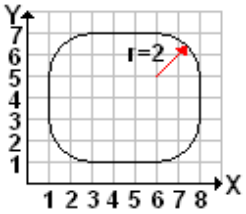
b. Chamfer with different distances

REC↵
- C↵ ← Chamfer will be applied
- 2↵ ← First chamfer distance
- 1↵ ← Second chamfer distance
- 1,1↵ ← First Point
- #7,6 **OR** 6,5 ← Diagonally opposite second point



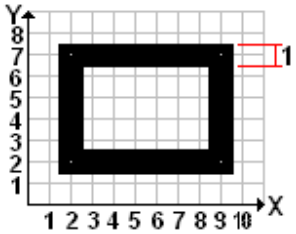
(ii) Fillet

REC↵
F↵ ← Fillet will be applied
2↵ ← Radius for fillet
1,1↵ ← First Point
#8,7 **OR** 7,6 ← Diagonally opposite second point



(iii) Width

REC↵
W↵ ← Width will be applied
1↵ ← Width unit
2,2↵ ← First Point
#9,7 **OR** 7,5 ← Diagonally opposite second point



POINT Tool Command (PDMODE & PDSIZE Properties)

The command for point tool is '**POINT**' or '**PO**'. It is just used to locate points on drawing screen. Shape of points can be determined with command '**PDMODE**' as shown below. Try given code to see how it works,

PDMODE Shapes	0	1	2	3	4
Extra Surrounding Shape	32	64	96		
e.g. 96+2 = 98, shape will be,					

In order to understand working area clearly, just draw two lines with following command
L↵
100,0↵
-100,0↵
0,100↵

Now, we'll set our points to determined area,

PO 10,10↵
PO 50,50↵
PO 90,90↵

It may not be possible to see points easily because they are just points. Let's change representation of points by using PDMODE command. Try shown lines on right one by one. You will see that, shapes representing points will change

PDMODE 2↵
PDMODE 3↵
PDMODE 4↵
PDMODE 34↵
PDMODE 68↵
PDMODE 99↵

Now, zoom out and write following command

PO 30,30↵

You'll see that point representation is dependent to zoom ratio.

PDSIZE controls the size of the point figures, except for PDMODE values 0 & 1

A setting of 0 generates the point at 5 percent of the drawing area height.

A positive PDSIZE value specifies an absolute size for the point figures.

A negative value is interpreted as a percentage of the viewport size.

Now enter command PDSIZE 5↵

Locate more points (eg. 70,70 & 20,80) by zooming in and out. You'll see that there will be no change in size.

DIVIDE Tool Command

Command for divide tool is '**DIVIDE**' or '**DIV**'. Creates evenly spaced point objects along the length or perimeter of an object.

Draw a horizontal line using following command,

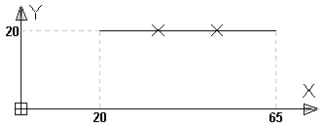
L↵
20,20↵
45,0↵

Now let's set points on line which divides it to 3 equal sections.

DIV↵
<select line object>
3↵

Let's change shape and size of point object.

PDMODE 3↵
PDSIZE 2↵



MEASURE Tool Command

Command for measure tool is '**MEASURE**' or '**ME**'. Creates point objects at measured intervals along the length or perimeter of an object. (Do NOT clear previous example).

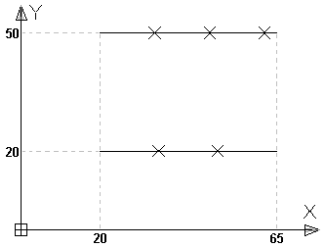
Draw a horizontal line using following command,

L↵
20,50↵
45,0↵

Now let's set points on line for intervals of 14 units.

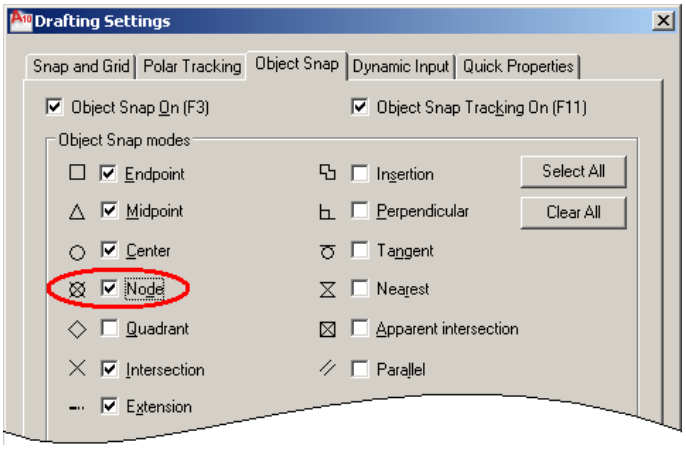
ME↵
<select line object>
14↵

As can be seen line is pointed with 14 units intervals.



OBJECT SNAP Command

It is possible to draw lines or other objects by using your mouse pointer and snapping on various parts of other objects. In order to be able to snap on **point** object, '**node**' snap must be available (checked). The command for object snap is '**OSNAP**'. When 'OSNAP' command entered, following window appears, be sure that, 'node' is checked.



Do NOT clear previous example.

Now enter line command but do NOT give any coordinate from keyboard, just try to draw lines with your mouse by snapping on points.

Try to obtain following figure,

