UNIT 3– MODIFY COMMANDS

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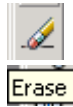
Objectives: At the end of this unit, you will be able to familiarise with the following
               Modify Commands:

               Erase, Copy, Mirror, Offset, Array, Move, Rotate, Scale, Stretch, Trim,
               Extend, Break, Chamfer, Fillet and Explode

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(1)   The **ERASE** command

       ⦿ Toolbar

                                          // The tooltip will appear when you
                                             hold the mouse pointer over the
                                             Erase button.

       ⦿ Pull-down manual   **Modify → Erase**

       ⦿ Command line   **erase** or **e**

       ● **Erase** command performs the same function as the "**delete**" key on the
         keyboard as shown in **Figure 3-1**.

       ● **Draw → Rectangle**

                                          // any dimensions

       ● **Draw → Line**

                                          // draw diagonals

         When you draw diagonals, it is better to turn-on **OSNAP** (F3) so that it
         can snap at the corner of the rectangle. When it happens, a yellow square
         and "endpoint" will appear.

● **Modify → Erase**

// select diagonals as objects
to be erased

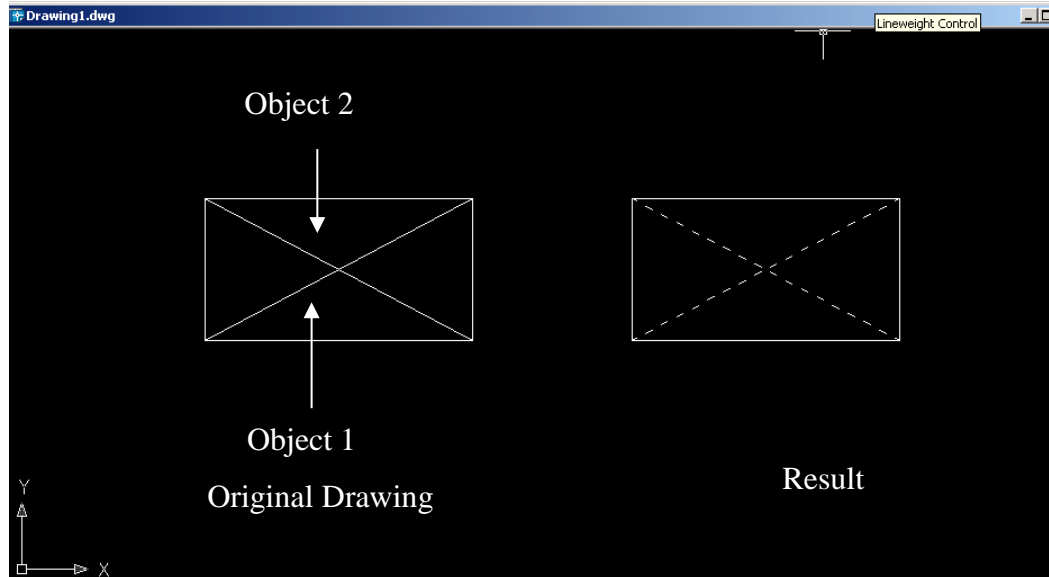● Don't forget to hit "**enter**" key if there is no more object to erase.

Figure 3-1: Use of **Erase** command

● Can you erase one side of the rectangle?

● No, you can't.

// rectangle is a single object, like a
polyline.

● Use "**Undo**" tool on the Standard Toolbar to bring back the rectangle just being erased.
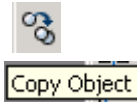
● Now, use the "**Explode**" command on the **Modify** Toolbar.

● After the rectangle being exploded, can you erase one side of the rectangle?

(2)   The **COPY** command

- ⭕ Toolbar

  Copy Object

- ⭕ Pull-down manual   Modify → Copy

- ⭕ Command line   **copy** or **cp** or **co**

- **Draw → Polygon**   // construct polygon

- Enter number of sides: **5**

- You can choose either **inscribed** or **circumscribed** in this example, as shown
  in **Figure 3-2**.

- Radius of circle: **50**

Figure 3-2: Inscribed/Circumscribed

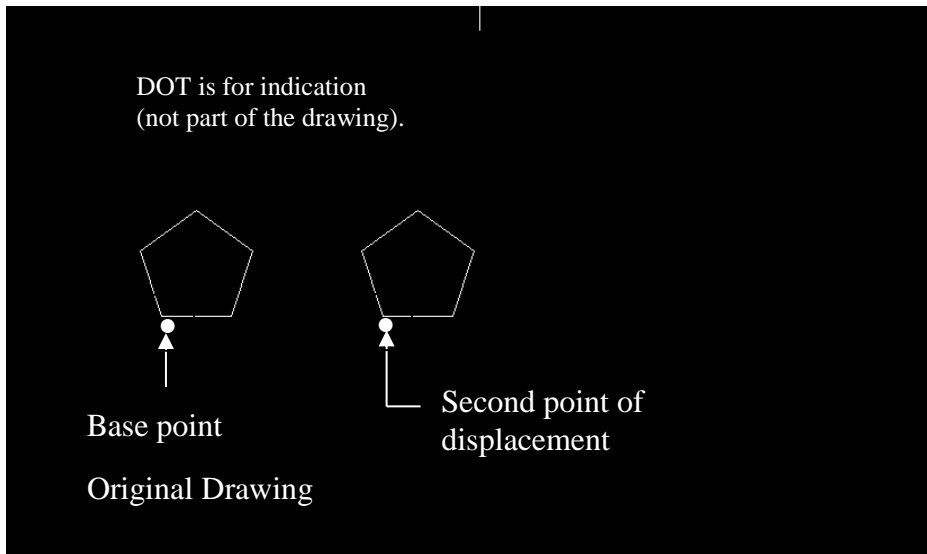- **Figure 3-3** shows the use of **Copy** command.

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DOT is for indication
(not part of the drawing).

Base point

Original Drawing

Second point of
displacement

Figure 3-3: Use of **Copy** command

3)   The **MIRROR** command

⦿ Toolbar

⦿ Pull-down manual   Modify → Mirror

⦿ Command line   **mirror** or **mi**

● **Draw → Circle**

                              // radius = 50

● **Draw → Polyline**

                              // start width = 5; end width = 0

● When you draw Polyline, don't forget to turn-on **OSNAP** (F3).
  You can Object Snap at the centre of the circle, which is the Start Point of the
  Polyline as shown in **Figure 3-4**.

● Refer to the Polyline command in Unit 2 for the construction of
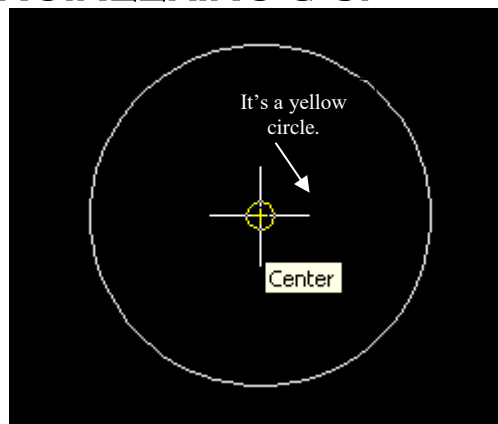 the clock.

Figure 3-4: Use of OSNAP (F3)
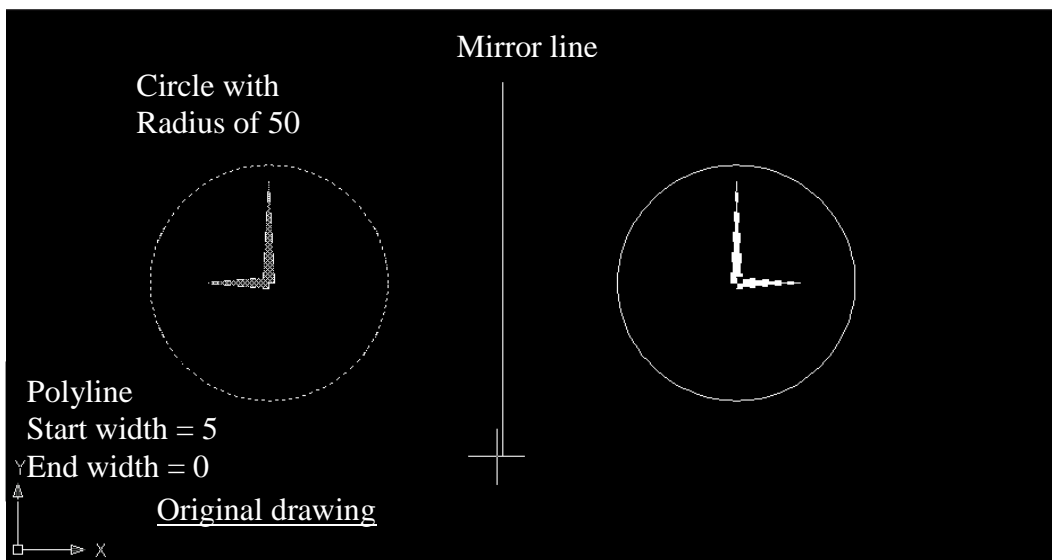
● **Figure 3-5** shows the use of Mirror command.

Figure 3-5: Use of Mirror command

(4)   The **OFFSET** command

 ◉ Toolbar

 ◉ Pull-down manual   Modify → Offset

 ◉ Command line   **offset** or **o**

● Draw → Polyline

● Start point

                              // choose any point

● Specify next point or [Arc/Halfwidth/Length/Undo/Width]: **A**

                              // arc

● [Angle/CEnter/Direction/Halfwidth/Line/Radius/Second pt/Undo/Width]: **A**

                              // angle

● Specify included angle: **-180**

● Specify endpoint of arc: **80**

● [Angle/CEnter/Direction/Halfwidth/Line/Radius/Second pt/Undo/Width]: **L**

                              // choose line
                              // bring cursor down with ORTHO on (F8)

● Specify next point or [Arc/Halfwidth/Length/Undo/Width]: **80**

● Specify next point or [Arc/Halfwidth/Length/Undo/Width]: **80**

                              //bring cursor to the left

● Specify next point or [Arc/Halfwidth/Length/Undo/Width]: **c**

                              // close

● You will get the drawing on the left in **Figure 3-6**.

● You can refer to Unit 2 for the construction of the object.

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● The uses of the Offset command are illustrated in **Figure 3-6**.
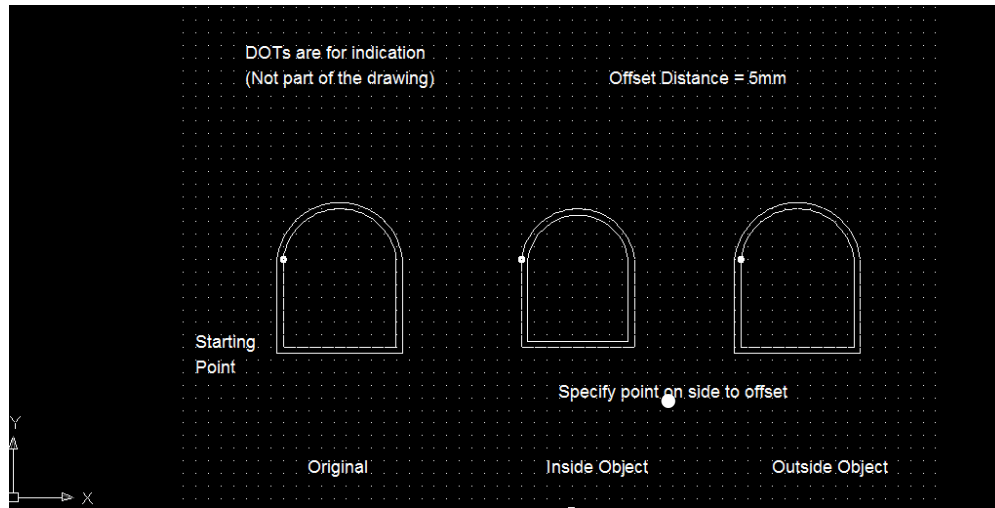

Figure 3-6: Use of Offset command

(5)   The **ARRAY** command

- ⊙ Toolbar

- ⊙ Pull-down manual   Modify → Array

- ⊙ Command line: **array** or **ar**

  - • ARRAY Select object: Window the triangle in Figure 3-7
  - • ARRAY enter Type (**R**ectangular **PA**th **PO**lar) <Polar>: R

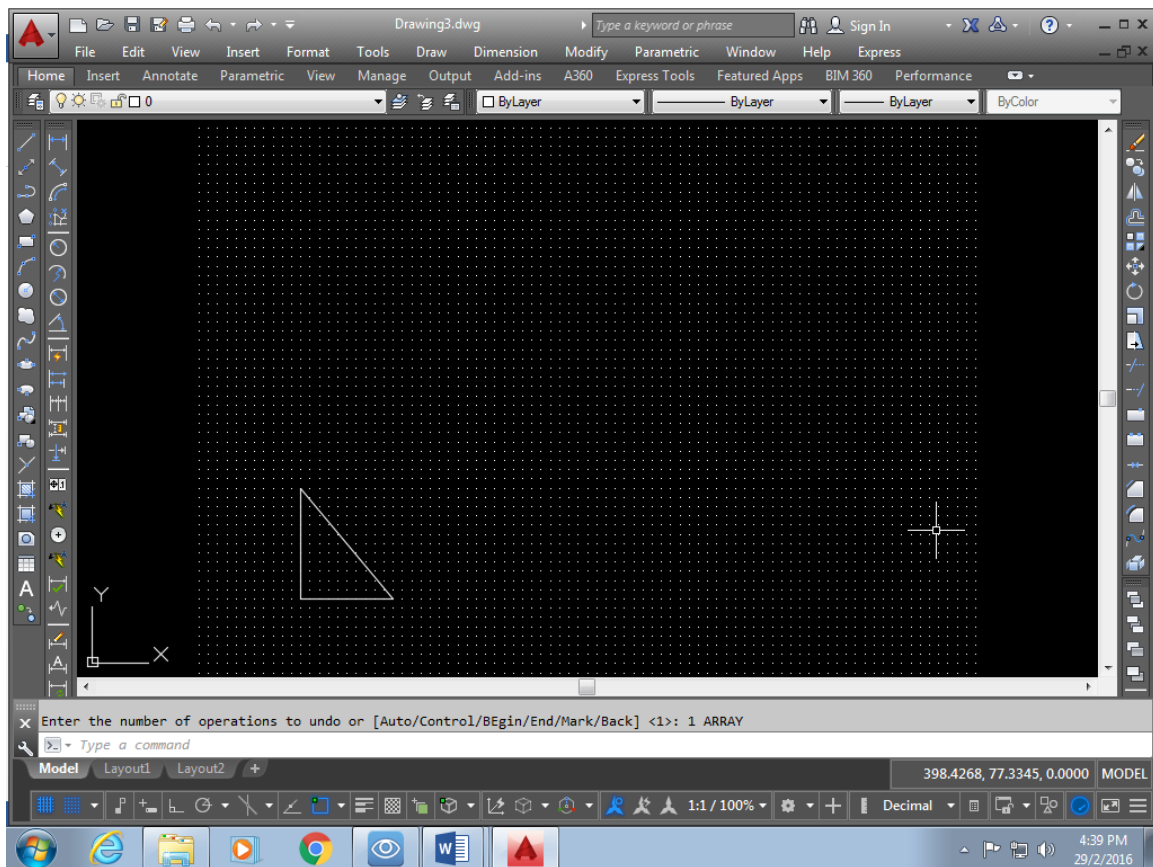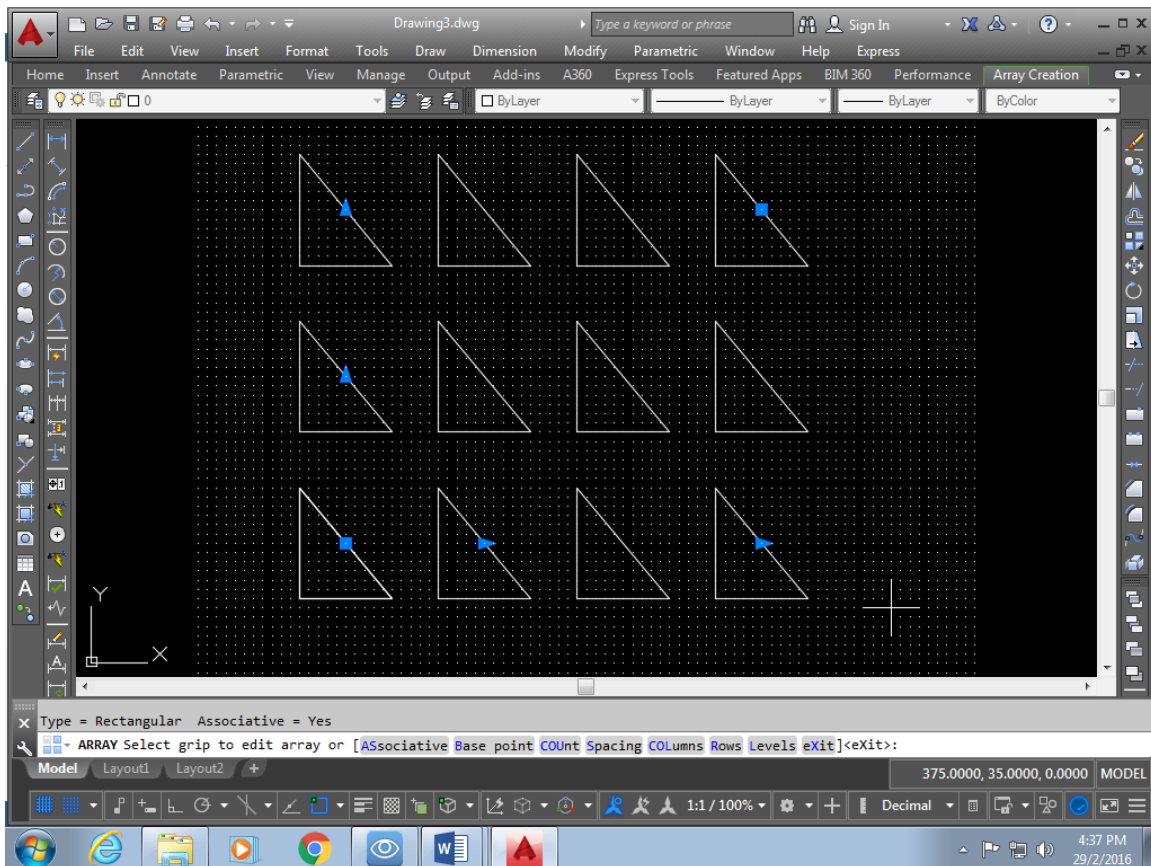A rectangular array appears as shown in Figure 3-8.

Figure 3-7 Array

Figure 3-8: A rectangular array

Try out Polar Array as shown in Figure 3-9.
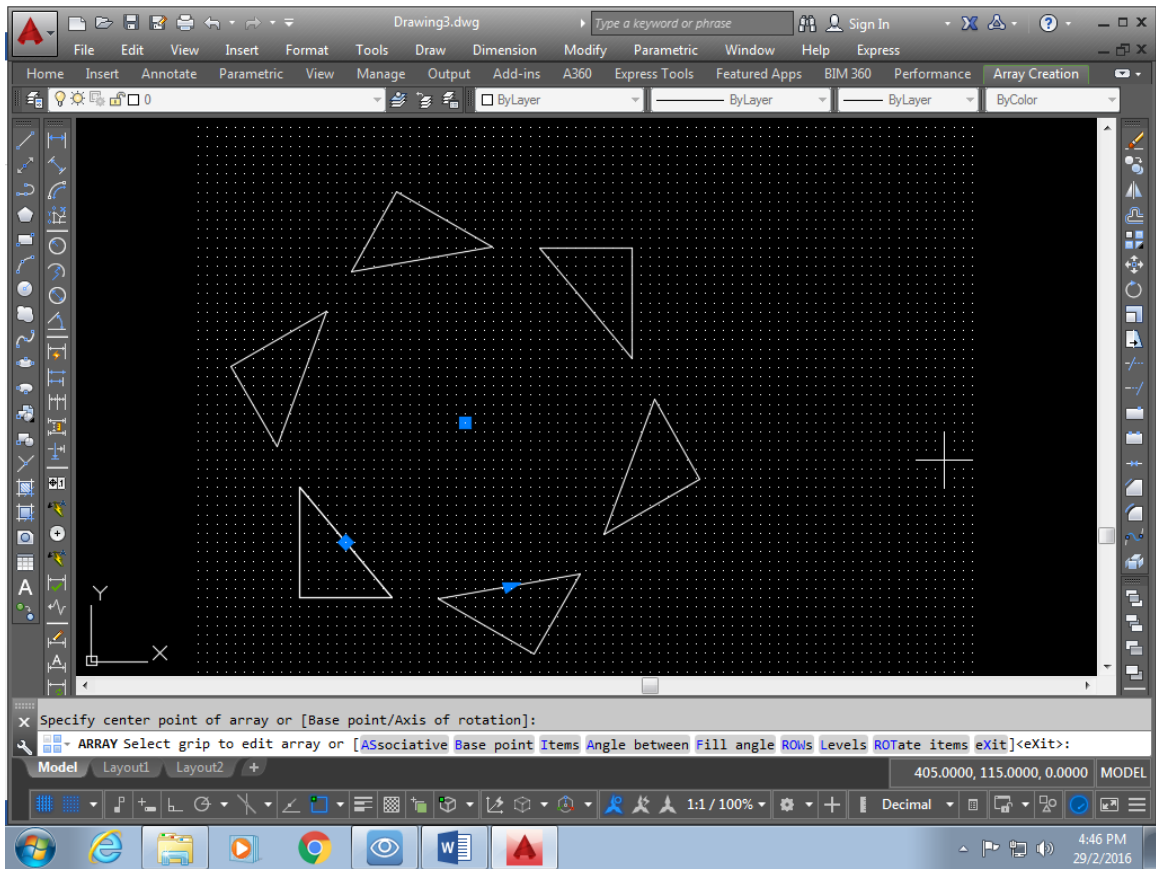
Figure 3-9: a Polar Array

(6)   The **MOVE** command

- ⊙ Toolbar

- ⊙ Pull-down manual   Modify → Move

- ⊙ Command line   **move** or **m**
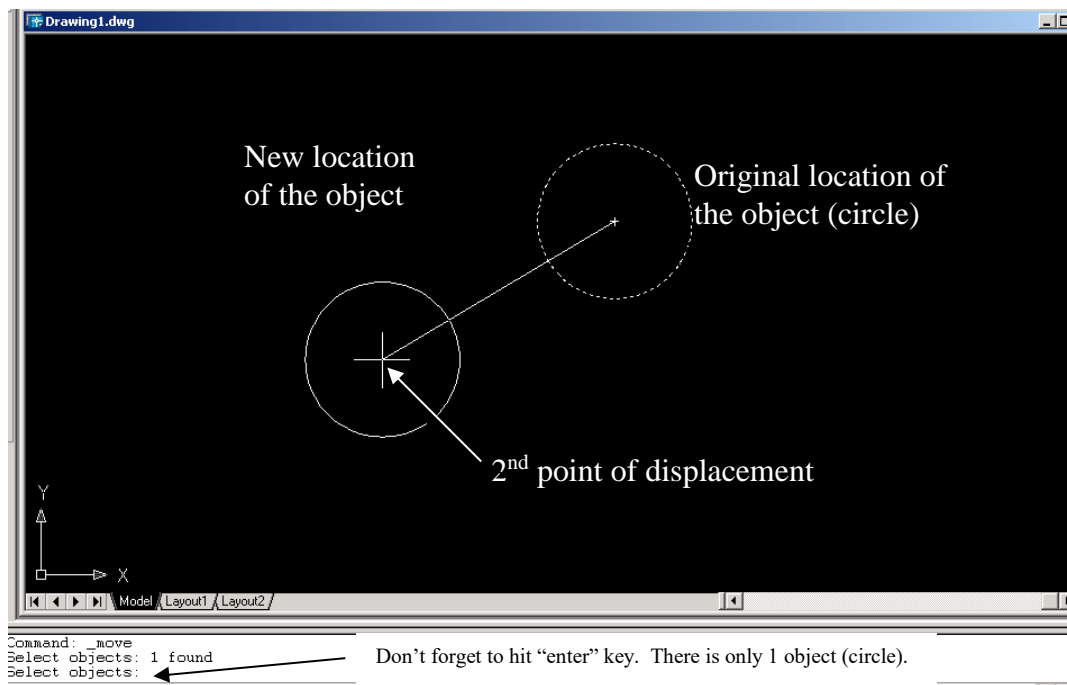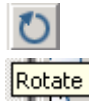
- ● The effect of the Move command is shown in **Figure 3-13**.

Figure 3-13: Effect of the Move command

(7)   The **ROTATE** command

    ⦿ Toolbar

    ⦿ Pull-down manual   Modify → Rotate

    ⦿ Command line   **rotate** or **ro**

- The effect of the Rotate command is shown in **Figure 3-14**.

- Positive angle in UCS is in counter clockwise direction.
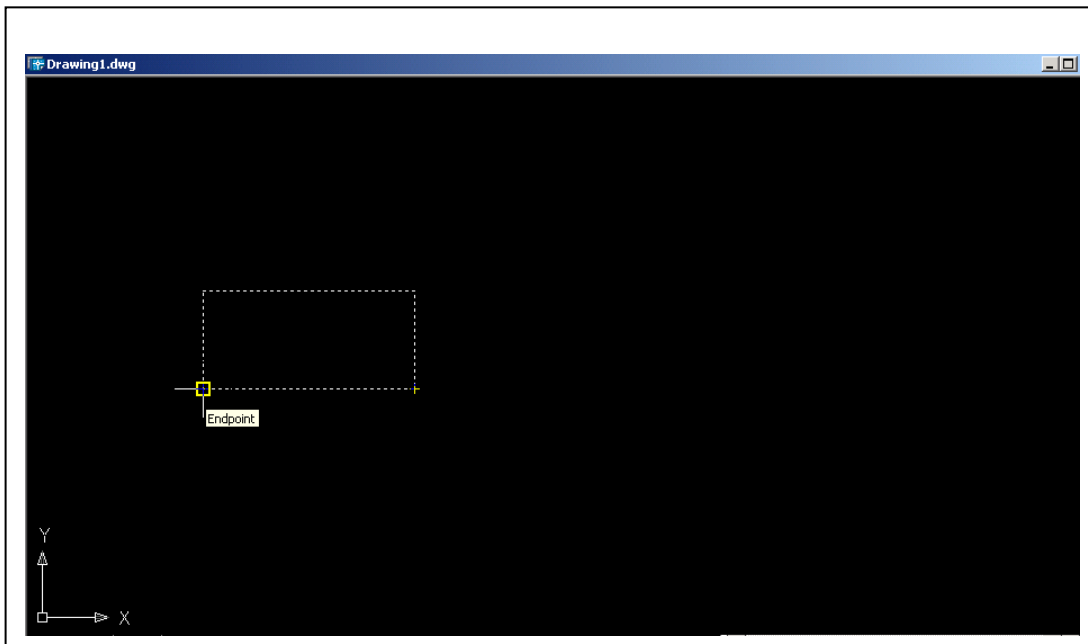
- Base point is the centre of rotation.

Figure 3-14: Effect of the Rotate command

(8)   The **SCALE** command

⊙ Toolbar

⊙ Pull-down manual   Modify → Scale

⊙ Command line   **scale** or **sc**

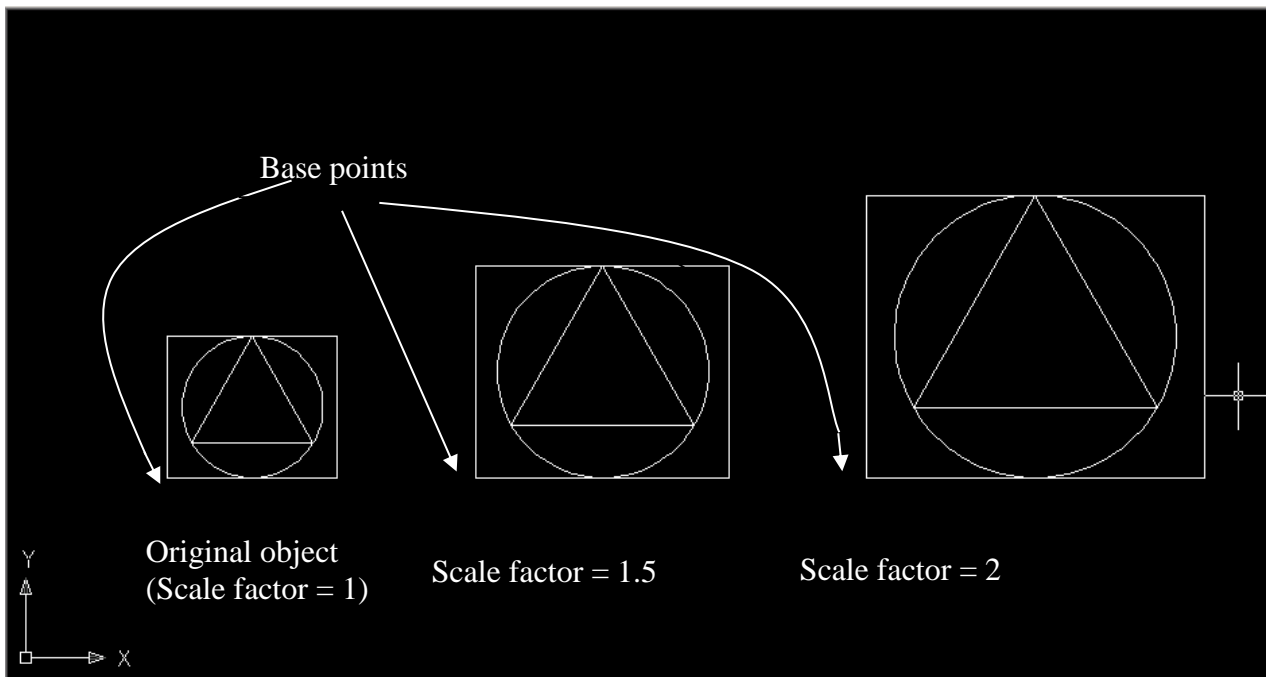● The effect of the Scale command is shown in **Figure 3-15**.

Base points

Original object
(Scale factor = 1)   Scale factor = 1.5   Scale factor = 2

Figure 3-15: Effect of the Scale command

(9)   The **STRETCH** command

    ◘ Toolbar

    ◘ Pull-down manual   Modify → Stretch

    ◘ Command line   **stretch** or **s**

    ● **Figure 3-16** shows the use of Stretch command.
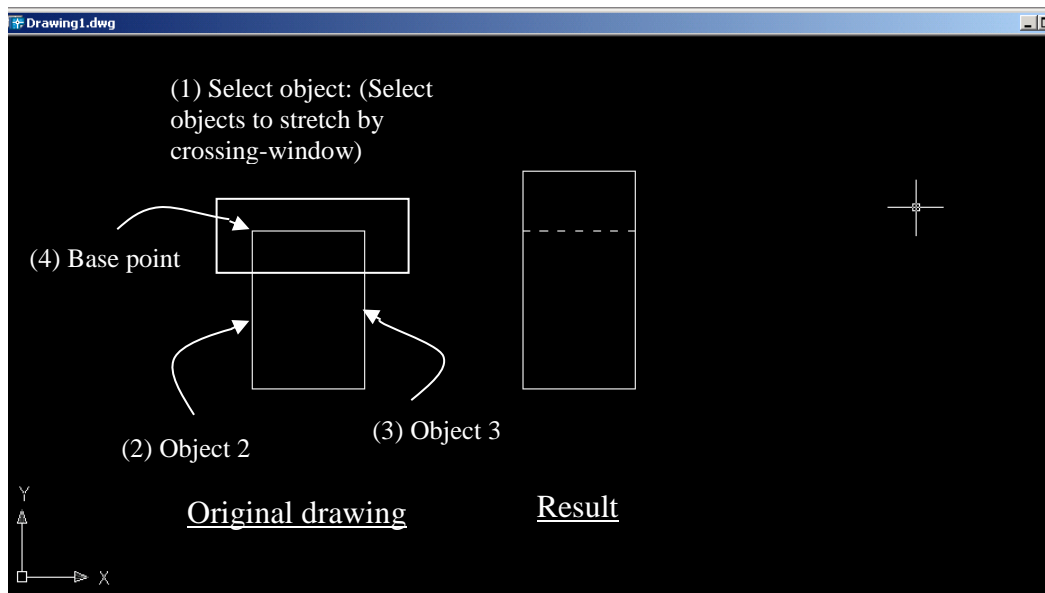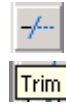
    ● Original drawing is a rectangle.

Figure 3-16: Use of Stretch command

(10)   The **TRIM** command

    ◘ Toolbar

    ◘ Pull-down manual   Modify → Trim

    ◘ Command line   **trim** or **tr**

    ● **Figure 3-17** shows the use of Trim Command.

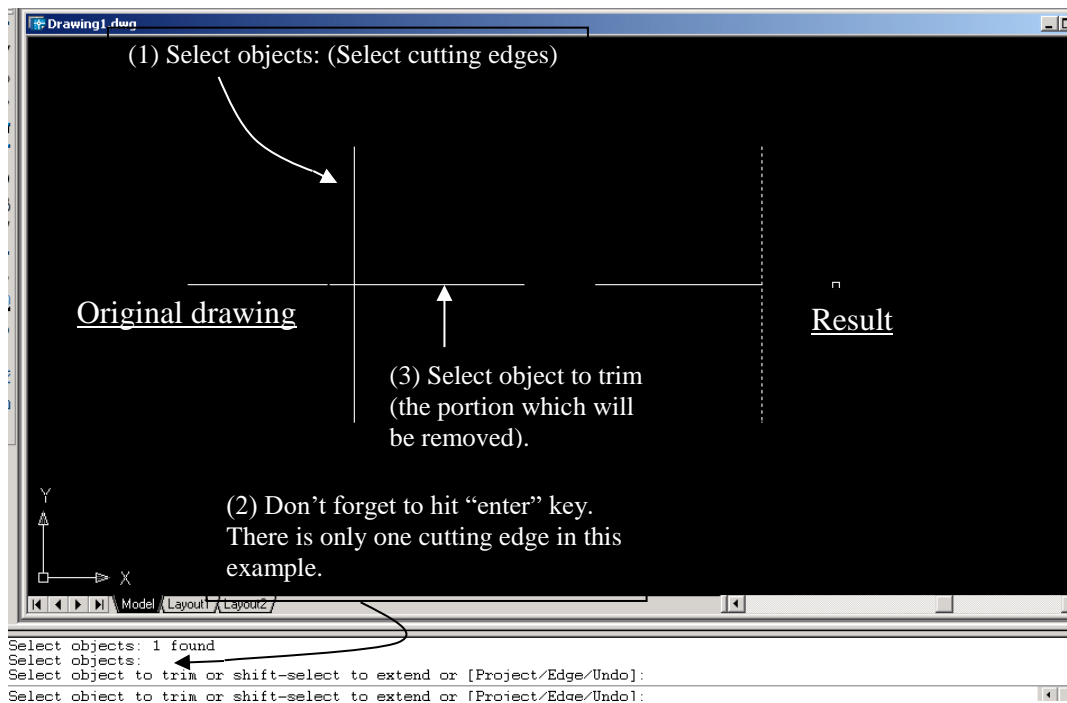**Figure 3-17:** Use of Trim Command

(11)   The **EXTEND** command

    ⭕ Toolbar

    ⭕ Pull-down manual   Modify → Extend

    ⭕ Command line   **extend** or **ex**
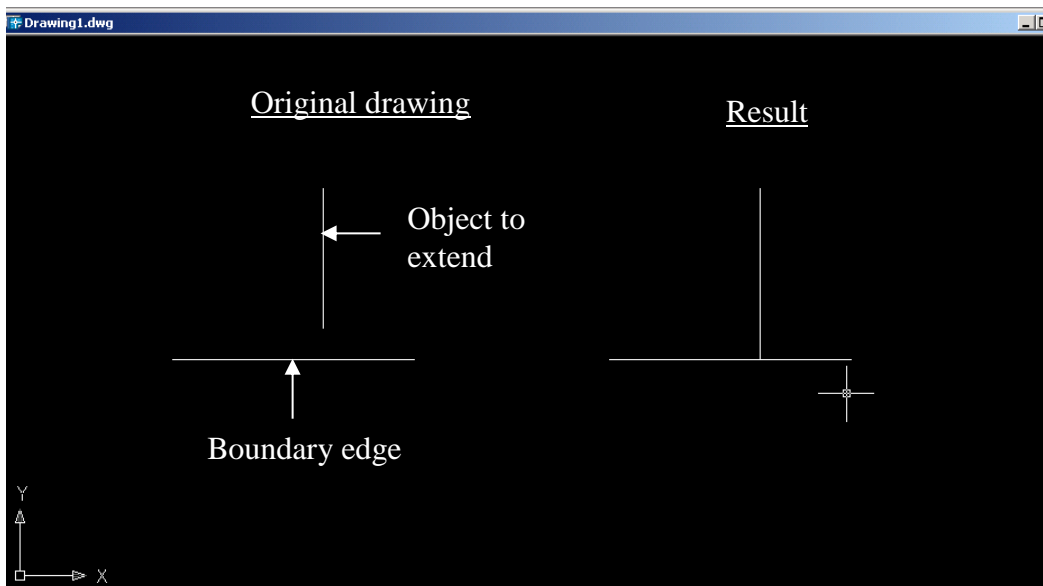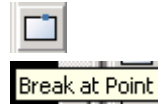
    ● **Figure 3-18** shows the use of Extend command.

Figure 3-18: Use of Extend command

(12)   The **BREAK AT POINT** command

    ◉ Toolbar

                                      Break at Point

    ◉ Pull-down manual   Not Appropriate

    ◉ Command line   Not Appropriate

- To split an object in two **without erasing a portion** as shown in **Figure 19**.

- It is a useful command when TRIM command does not work.

- Select object   // choose the line on the left

- First break point   // as shown in **Figure 3-19**
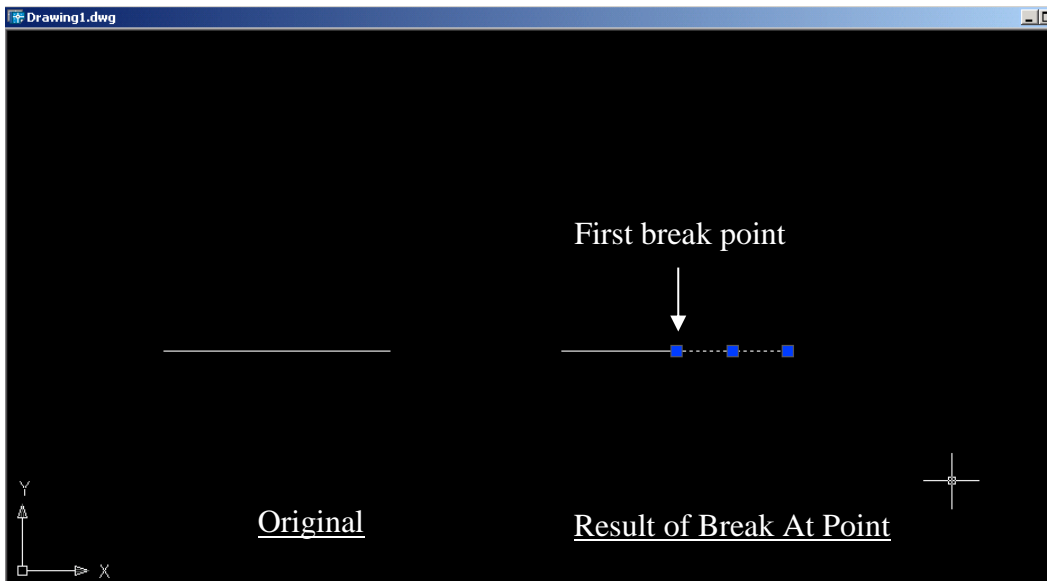- Second break point: @   // no action is required

Figure 3-19: Use of Break at Point command

(13)   The **BREAK** command

- **O** Toolbar

- **O** Pull-down manual   Modify → Break

- **O** Command line   **break** or **br**

- ● **Figure 3-20** shows the use of Break command.

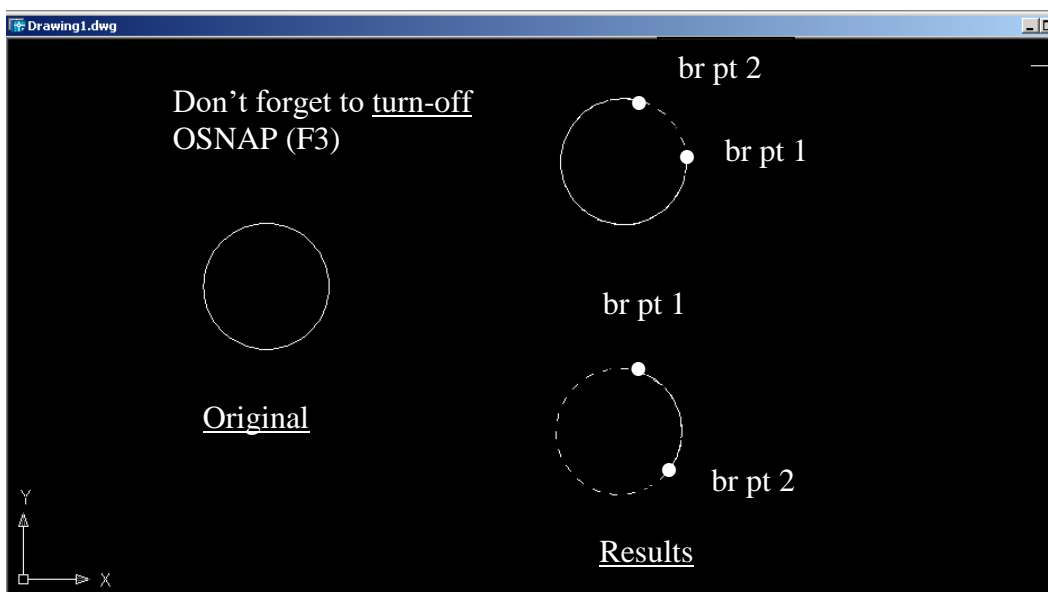**Figure 3-20:** Use of Break command

(14)   The **CHAMFER** command

- Toolbar

- Pull-down manual   Modify → Chamber

- Command line   **Chamfer** or **cha**

● Select first line or [Polyline/Distance/Angle/Trim/Method/Multiple]: **D**

// distance

● Specify first chamfer distance <0.0000>: **20**

● Specify second chamfer distance <20.0000>: enter

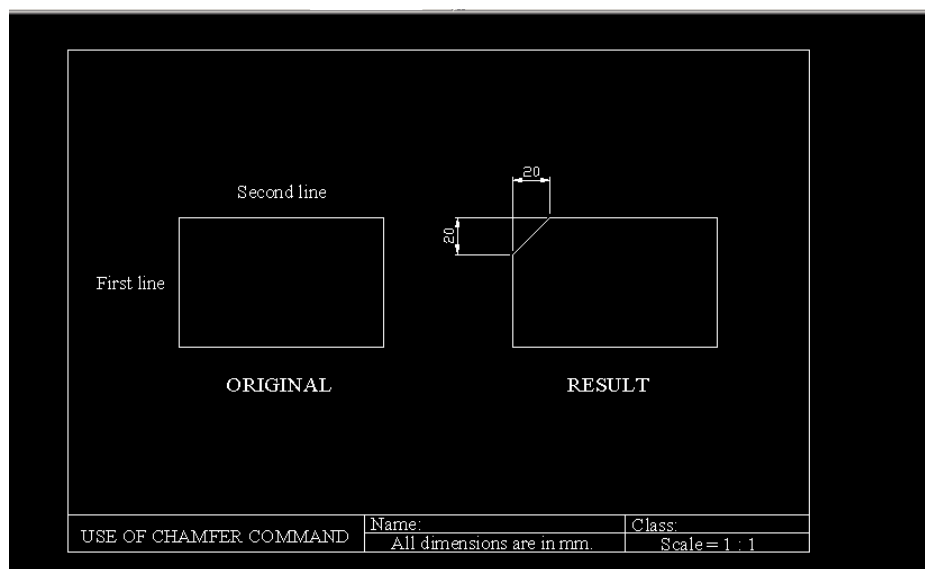● **Figure 3-21** shows the use of Chamfer command to bevel the corner.

Figure 3-21: Use of Chamfer command

(15)   The **FILLET** command

    ◉ Toolbar

    ◉ Pull-down manual   Modify → Fillet

    ◉   Command line   **fillet** or **f**

    ● Select first object or [Polyline/Radius/Trim/Multiple]: **r**   // radius

    ● Type **20**   // radius = 20
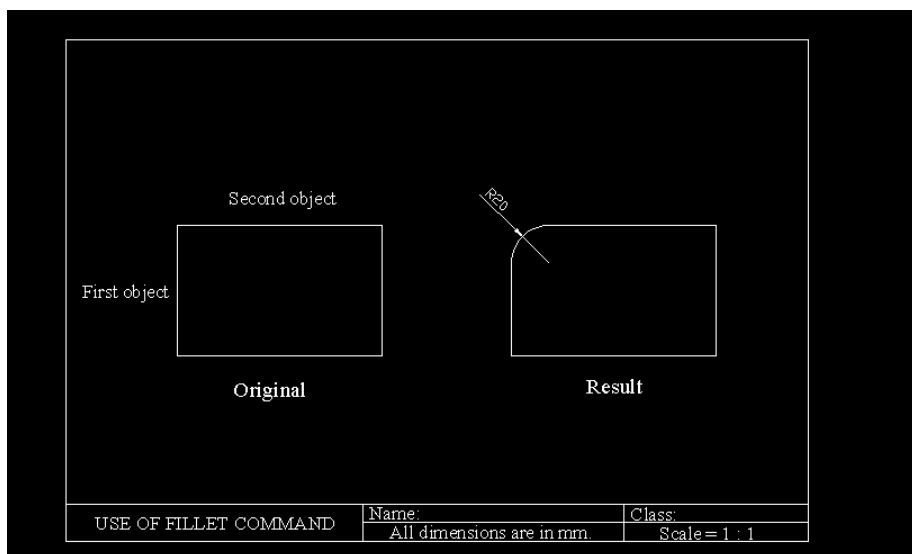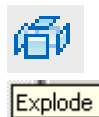
    ● **Figure 3-22** shows the use of Fillet command.

Figure 3-22: Use of Fillet command

(16)   The **EXPLODE** command

⊙ Toolbar

Explode

⊙ Pull-down manual   Modify → Explode

⊙ Command line   **explode**

● Explode can be use to break up the polyline (1 entity) to many entities. E.g. a square has 4 sides. If drawn using polyline, all the 4 lines is just 1 object or entity. However, if the polyline is exploded, then it will beak up into 4 separate entities or objects, in this case 4 separate lines.

----- END OF UNIT 3 -----