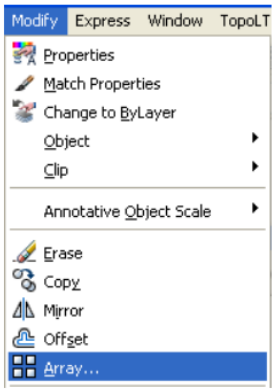
Array command: (Create an array of elements)

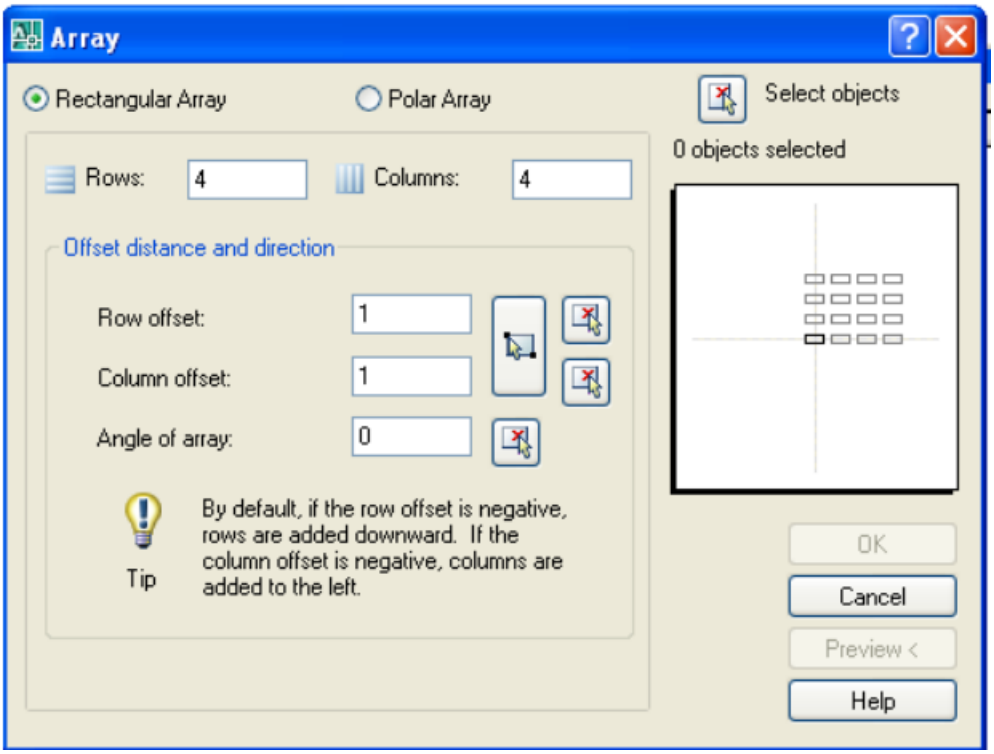
In many cases of drawing in Auto CAD, you need to repeat a specific element in a specific system, such as drawing, for example Seats around a table or a group of trees planted in a specific pattern and a lot of drawings that take a lot of time to repeat in traditional ways, and to save time and effort we resort to the Array command in repeating these elements, through this command we can form a matrix of rectangular elements consisting of a number of lines and columns or form a matrix Polarity by specifying an angle and a center point, and each element in the matrix can be another matrix.

Execution methods:

- Choose the command from the dropdown list **Modify>Array.**



- Or from the modification toolbar by clicking on the command icon 
- Or by typing the command or its abbreviation **Ar** on the command bar.
- When executing the command in one of the previously mentioned ways, the Array dialog window will open
- In the dialog window at the top, we see that there are two types of arrays
  1-(Rectangular Array)
  2-(Polar Array)

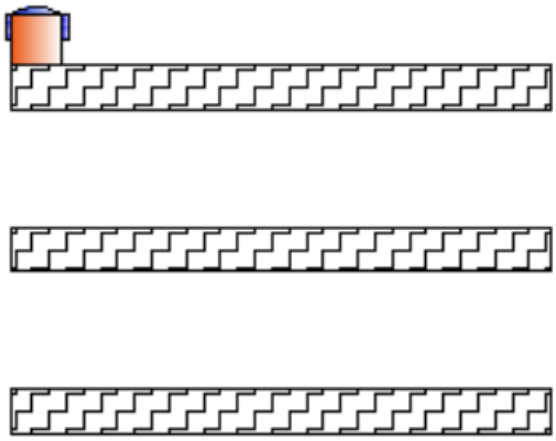


Create a rectangular array

- make the Array Rectangular option active by clicking on the circle to the left of the option, so it appears in green, indicating its activation.

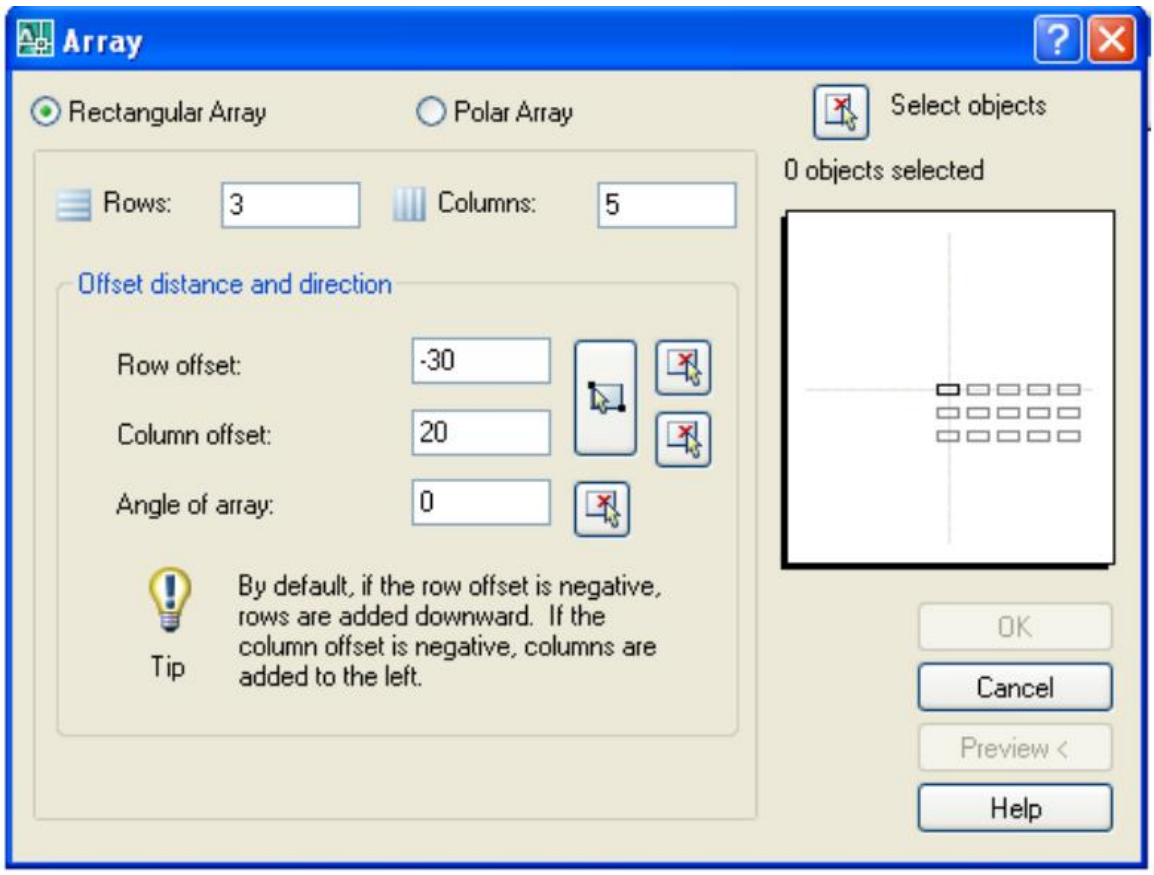
- Enter the number of rows or lines (horizontal iterations) of the matrix in the box **Rows** Let it be 3 rows.
- Enter the number of columns required for the matrix in the **Columns** box, let it be 5
- Enter the distance between the rows in the **Offset Row** box by typing the value in the box. In the default case, the program adds the line to the top of the element to be repeated, and in the case of wanting to add the line below the element, the space is entered in a negative (-) in case you do not know the distance and want to specify the space between Lines on the drawing Press the button to the right of the square, and the dialog window temporarily disappears The drawing screen appears and the program asks you to specify the distance between the line through two points that you specify by clicking on the drawing or in any other way of specifying points.
- Enter the space between the columns in the **Offset Column** box by typing the value inside the box. In the default case, the program adds the columns to the right of the

element to be repeated, and if you want the columns to be to the left, enter the value in the negative (-). As we have seen in the rows, you can also enter the distance between the columns on the drawing by selecting two points in the same way that was explained in the rows.

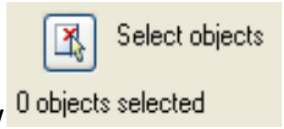


In this example, we will create a matrix of the element shown in the drawing, with 3 lines and 5 columns, and since we want the rows below the element, we will enter a value of 30 and for the columns 20, because we want to repeat the columns to the right.

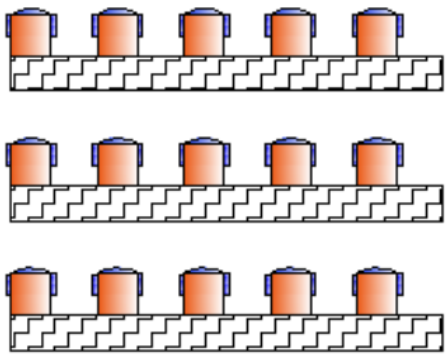
To specify an inclination angle for the elements of the array, enter the value of the angle in the **Angle of Array** box. Where we do not want the inclination of the matrix, we make the value **zero**. The settings window becomes as shown below, with a preview of the matrix structure on the right of the window



Now select the element to be repeated by pressing the **Select object** button on the

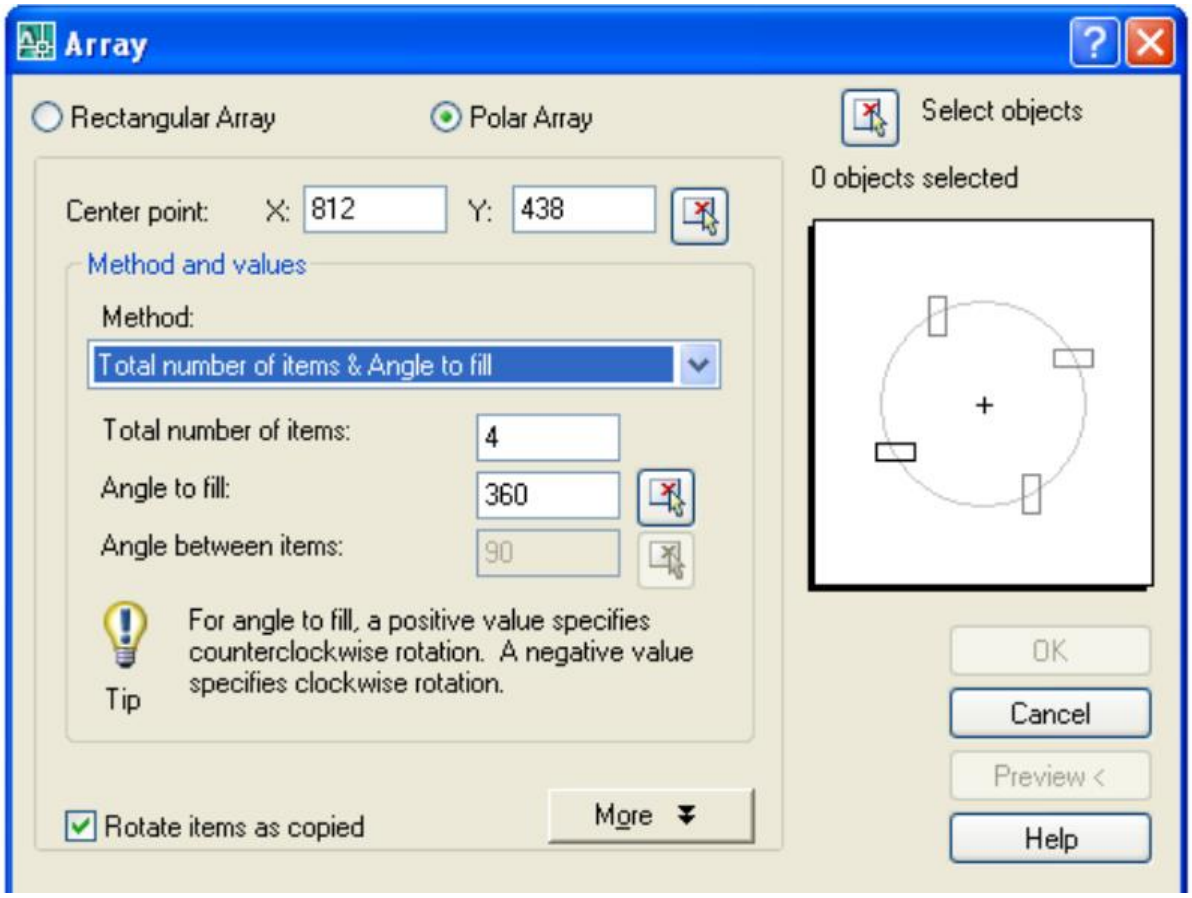


right of the window . The screen will temporarily disappear to show the drawing screen. Choose the element in any of the selection methods. Then Enter, after which the dialogue window will return to appear, and it has loaded the number of objects constituting the element or elements that have been selected. Press **OK**, you will get the required matrix.

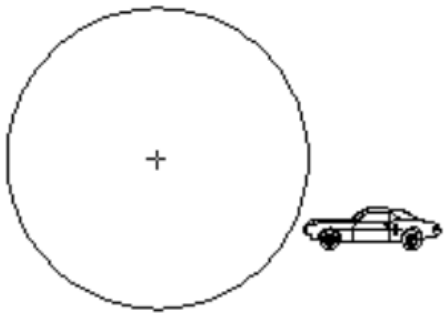


Create a Polar Array

- make the Array Polar option active by clicking on the circle to the left of the option, so it appears green, indicating its activation.



-Determine the center point of the array by entering the absolute coordinates of the point in the Center point box and entering the Y & X values, or press the button to the right of the box to select the center point by grabbing it from the drawing screen, where the dialog window closes temporarily and the drawing area appears where you can select the point on the drawing.



-Specify the method and input values to determine the final form of the matrix from the square: **Method and values**

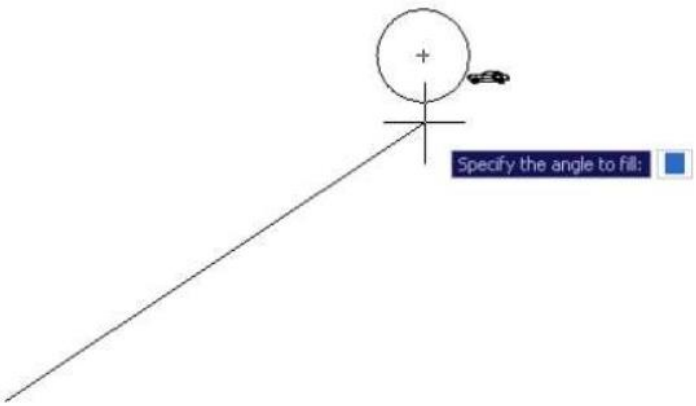
- ❖ if you choose the **Total number of items & angle to fill** method, there is no need to enter the value of the angle between the elements that make up the matrix, as the program will draw the matrix in terms of the number of its elements and the total angle that contains the array.
- ❖ If you choose the **Angle to fill& angle between items** method, there is no need to enter the total number of elements, as the program will find them through the total angle of the array and the angle between the elements of the array.

-Enter the values needed to define the matrix:

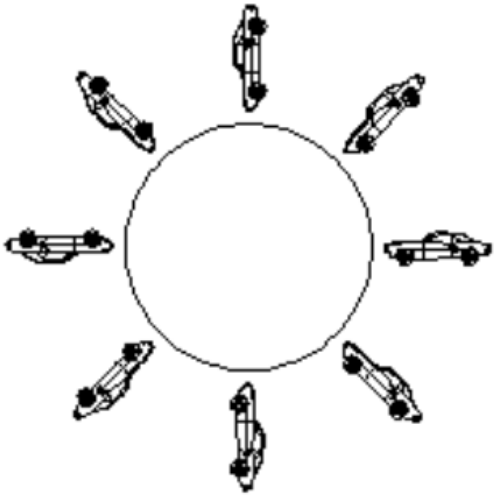
Total number of items: enter the number of elements of the array, the number in the default case is 4.

Angle to fill : enter the angle that defines the size of the array, which is the angle that contains the array and is confined between the base point of the first element and the base point of the last element in the array. If the value of the entered angle is positive, the program will draw the elements in a counterclockwise direction, and vice versa.

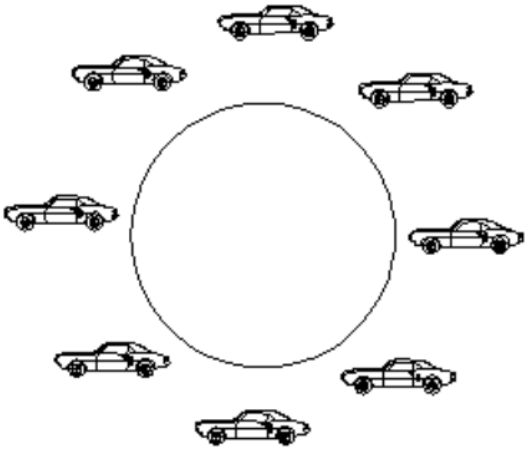
Angle between items: enter the angle between the base point of the array element and the center of the array itself. You can define the above two angles without entering the value, but by defining them on the drawing screen by pressing the button  next to the angle in question, so the dialogue window disappears temporarily to return to the drawing screen and define the angle by selecting a point attributed to a known point that the program defines for you.



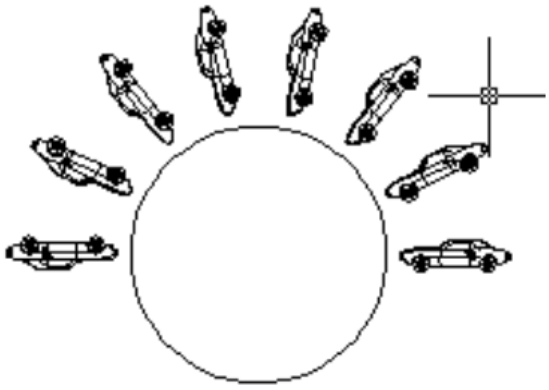
Rotate items as copied: When this option is activated, the items will be rotated according to what is seen in the preview window.



Rotate items are activated, and the total angle = 360

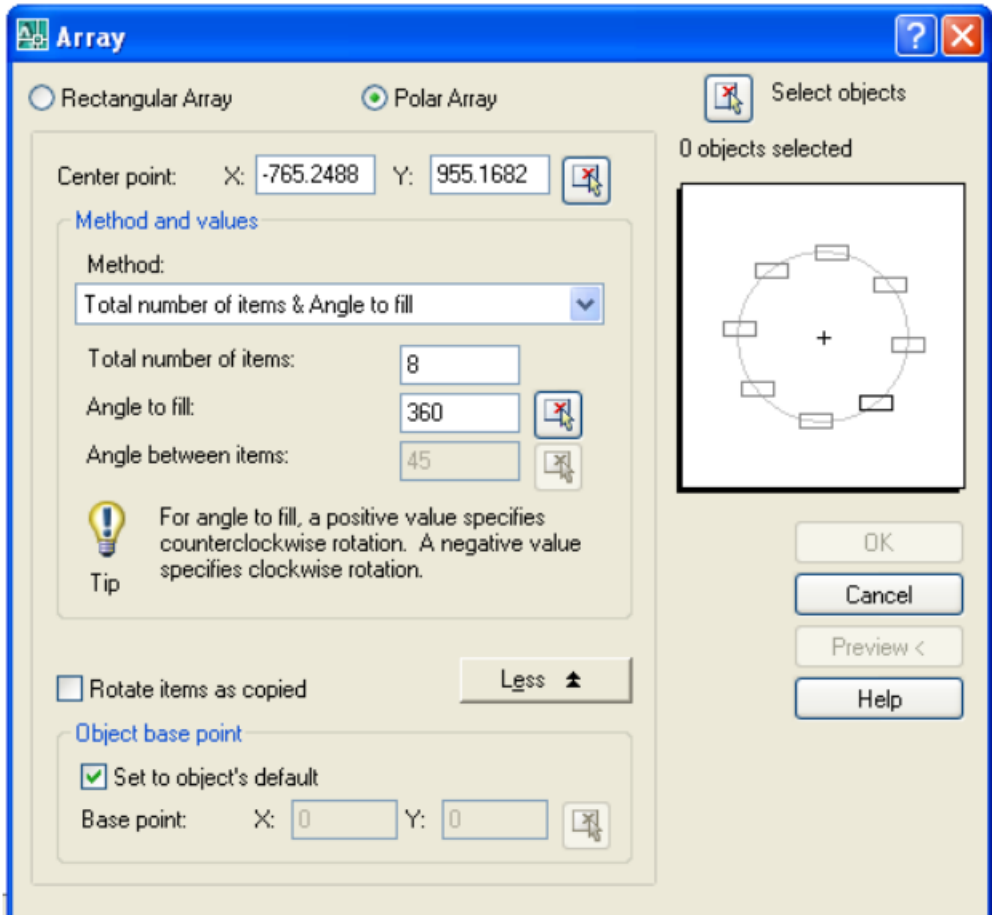


Rotate items are not activated, and the total angle = 360



Rotate items are activated, and the total angle = 180

More: At the bottom of the window, you will find the More button. By clicking on it, a part of the window will appear it was hidden and this part contains the settings for the base point of the element.



Set to objects default: If you activate this option, the program will adopt the default base point, and in the default case, the program will adopt different base points that depend on the shape of the element to be repeated, which are as follows:

Element	Default base point
arc, circle	Center point for these elements
Polygon and rectangle	The first corner
Line, polyline	starting point when drawing it

If the option is not activated, you will have to select a new base point, either by entering the coordinates in the base point box by entering the Y & X value, or by selecting them on the drawing by pressing the capture button.

- After completing the necessary settings for the array, press the **Select object** button on the right of the window, the window temporarily disappears, and the drawing screen appears, so that the element is selected in the known ways, then press **Enter**, and you return to the Array settings window, press **OK** at the bottom of the window, and you get the drawing.

Break command:(Split items)

With this command, you can split an element into two parts, leaving a space between them, or just separate them without leaving a space.

❖ To split an element into two elements, leaving a space, do the following:

-Choose the command from the drop-down menu bar Modify < Break.

- Or from the modify toolbar by clicking on the command icon  .

- Or by typing the command or its abbreviation BR on the command bar.

The program will ask you to select the element to be split or divided **Select object** select the item by left-clicking on it**.**

The program will ask you to select the second point to separate the element or th first point.

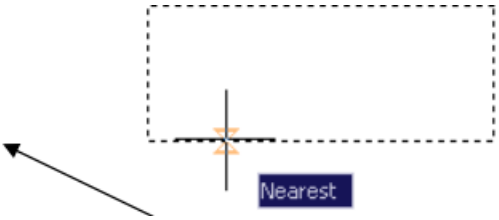
Specify second break point or [first point]

If you choose the second point by clicking on its location in the element, the program will consider that the first point is the place you clicked on the element when you selected it the first time, and the resulting shape will be as follows:

But if you want to specify a first point, then enter the letter F, the program will ask you to enter the first point. Enter the first point by clicking on its place on the element.

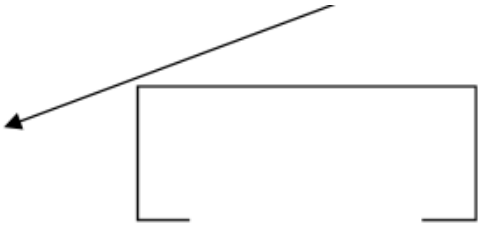
Enter the first point

The program will ask you to enter the second point for the end of the space that will separate the element Enter the second point



Enter the second point

So the resulting form:



❖ To split an element into two elements, **without** leaving a space:
after you choose the first point, and the program asks you to select the second point, select the second point in the location of the first point, or in a short and accurate way, enter the relative coordinates @0,0, so the element will be divided into two parts The dividing line is the first point.

The program allows you to execute this command directly by pressing the Break at point command icon located on the modify toolbar  , then the program asks you to **select only one point**.

Stretch command:

This command is used to shorten or lengthen graphic elements by stretching them on one side. And most of the graphic elements can be affected by this, lines, polyline , arcs.

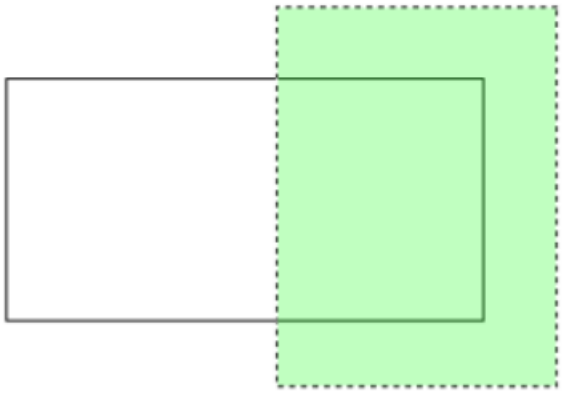
Execution method:

- from the drop down menu bar **Modify< stretch**
- Or from the modify toolbar by clicking on the command icon 
- Or by typing the command or its abbreviation, the letter S, on the command bar

When executing the command in one of the ways shown above, the program's usual message will appear**, Select object**. Select the item and press **Enter.**

taking into consideration:

The element is selected for this matter in a way that crosses the window, which was previously explained in the methods for selecting the element, and that any other method will not be useful for this matter. The least is one of the ends of the element, the end point, because the stretching process takes place from the ends and the vertices of the elements. Elements that are partially selected by the intersection are stretched, but those that are fully contained by the intersection move from their place.

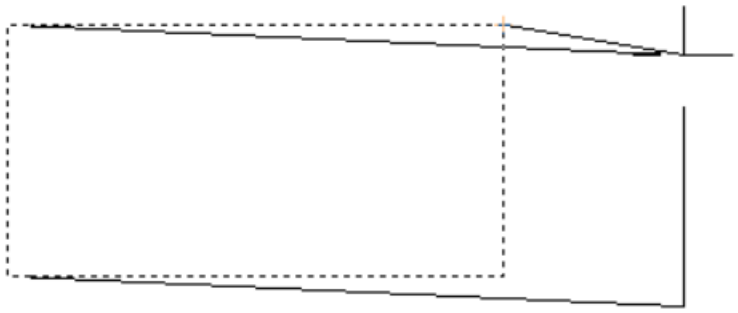


Item selection

After the item is selected, the program will ask you to specify the basis point

It will be lengthened or shortened **Specify base point**

Choose the base point by clicking on it or by typing the letter **d** on the command bar to activate the accompanying option **Displacement** and enter the coordinates of the point, you will notice that the base point is stuck to the cursor pending the selection of the second point to which you want to extend the element.



Select the base point

Select the second point in one of the known ways, such as directing the cursor specific direction clicking on the screen or typing the space you want on the command line, you will find that the element has been lengthened to this point.