



## Are you Parametric

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With the world changing so rapidly in the area of Design and Manufacturing it's essential for every engineer to create quick 3D models without loss of time and money. This can be made realistic only by using a technique called Parametric Modeling.

Parametric in general refers to the use of numeric parameters associated with orientation and coordinates (dimensions); i.e., specifying width in terms of length, and height in terms of length or width. Parametric is derived from the word parameter—parametric modeling generally allows automatic modeling of various sizes of a component from a single set of input data.

This tutorial focuses on how to create parametric models in Autodesk Inventor® 11.0.

Consider a simple CUBE to understand the concept of parameters. Create a cube of sides 50 X 50 X 50 mm.

Step 1. Draw a square of sides 50mm by 50mm as shown below in Autodesk Inventor.

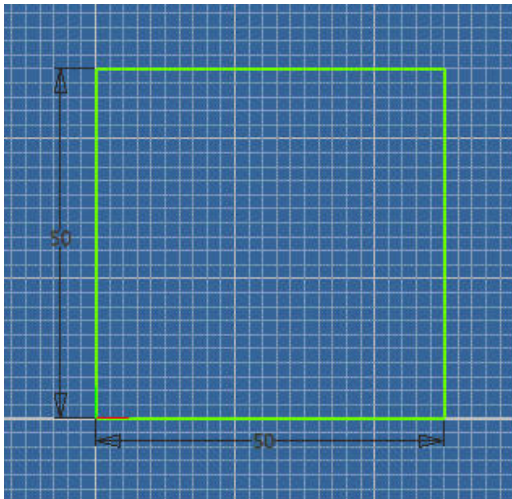


Figure 1: Square of sides 50mm

Step 2. Right-click and click on finish sketch, then select Extrude from the Part Feature Tool Bar as shown in Figure 3.

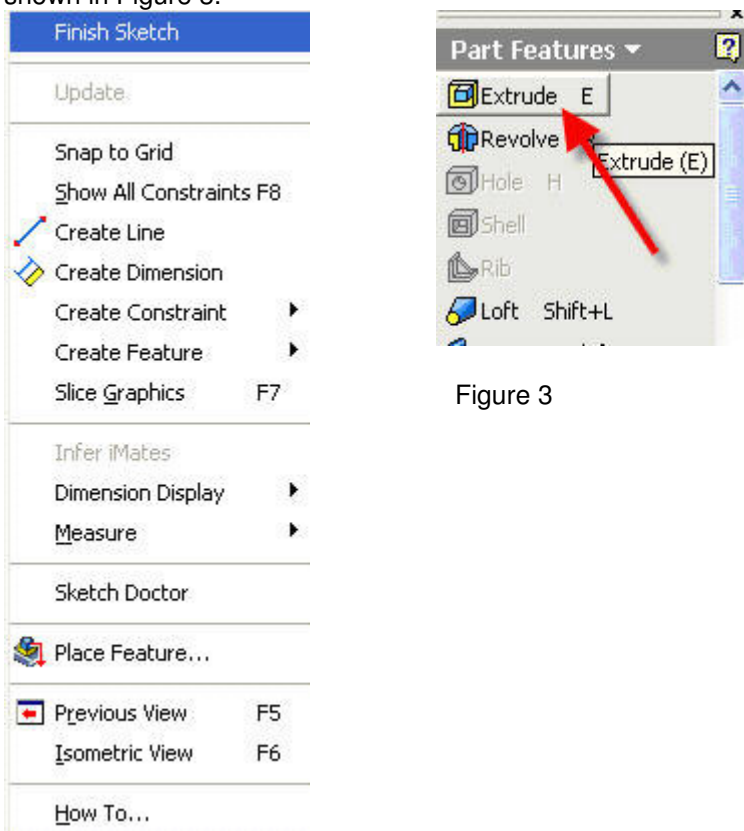


Figure 3

Figure 2

Step 3. Now enter the height as 50mm as shown in Figure 4.

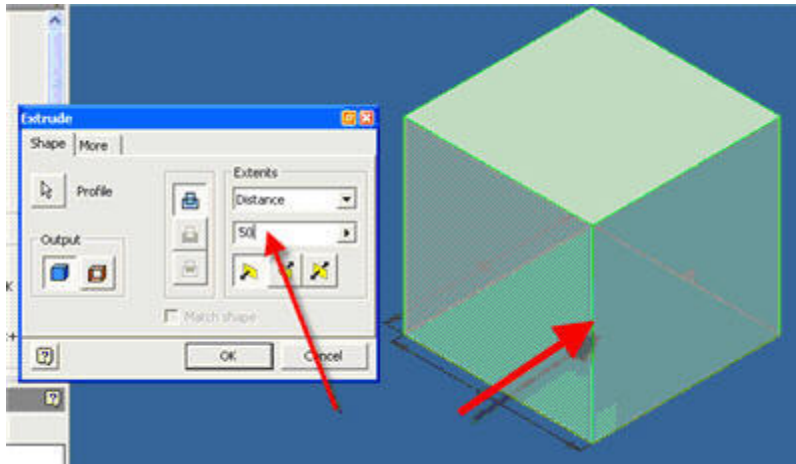


Figure 4

Step 4. Finished model of dimension 50 X 50 X 50 mm

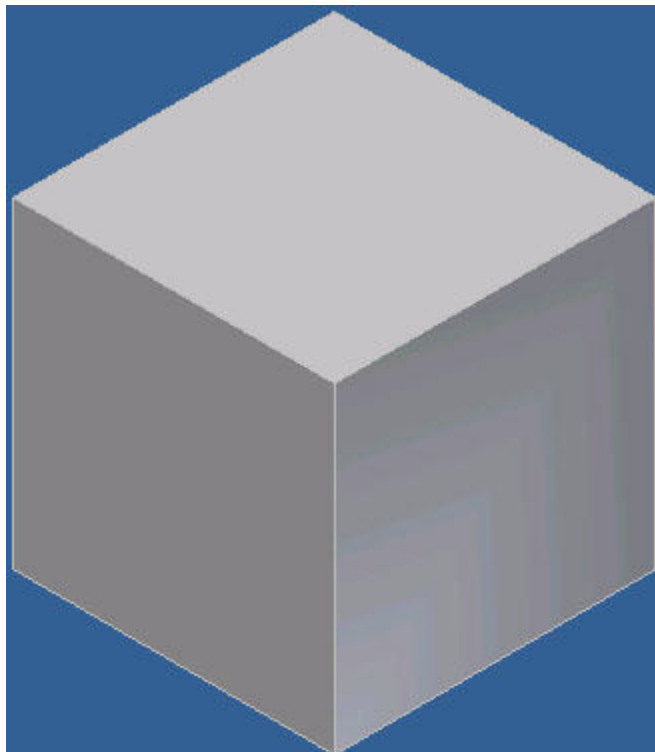


Figure 5

The method followed here is called non-parametric modeling. We shall now see how the same model can be created using parameters.

Create a square of sides 50 X 50 mm with length=width; i.e., width [d1]=length [d0] as shown in Figure 6 below.

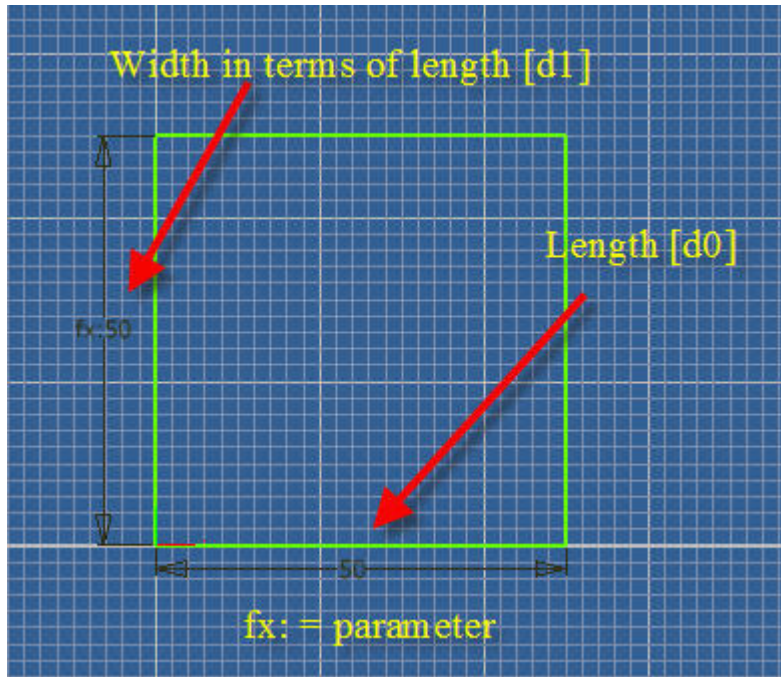


Figure 6

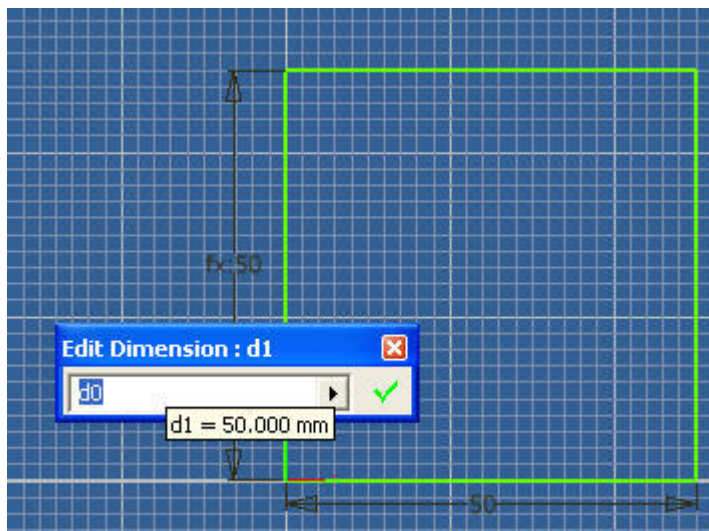


Figure 7

Note: Once the parameter is established, when you change the length to 55mm then the width also changes to 55mm because  $d1 = d0$ .

Now finish the sketch and select the extrude command from the part feature tool bar. In the distance column enter the value as  $d0$ ; i.e., the height is specified as a parameter of length. Now when you try to change the length to 35mm, the value of width [d1] and height [d2] also changes to 35mm.

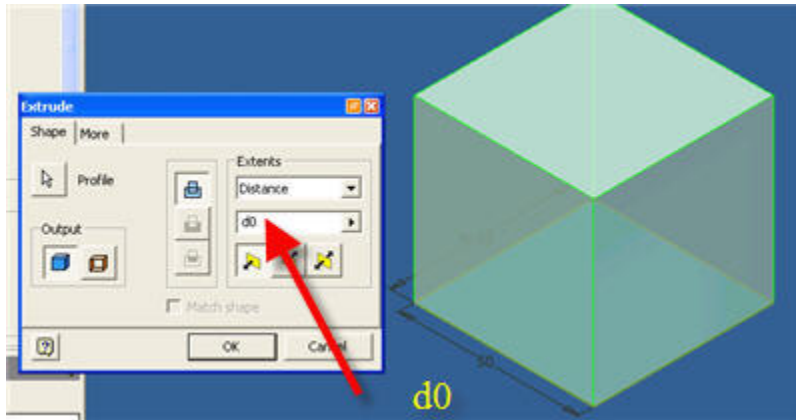


Figure 8

This type of modeling is called parametric modeling and is used when multiple components are to be created with a change in dimension for such items as bolts, nuts, washers, pins, and so on.