

PART MODELING ASSIGNMENT 10: Assembly

Objective:

To create an assembly of Nut and Bolt as shown in Figure 1

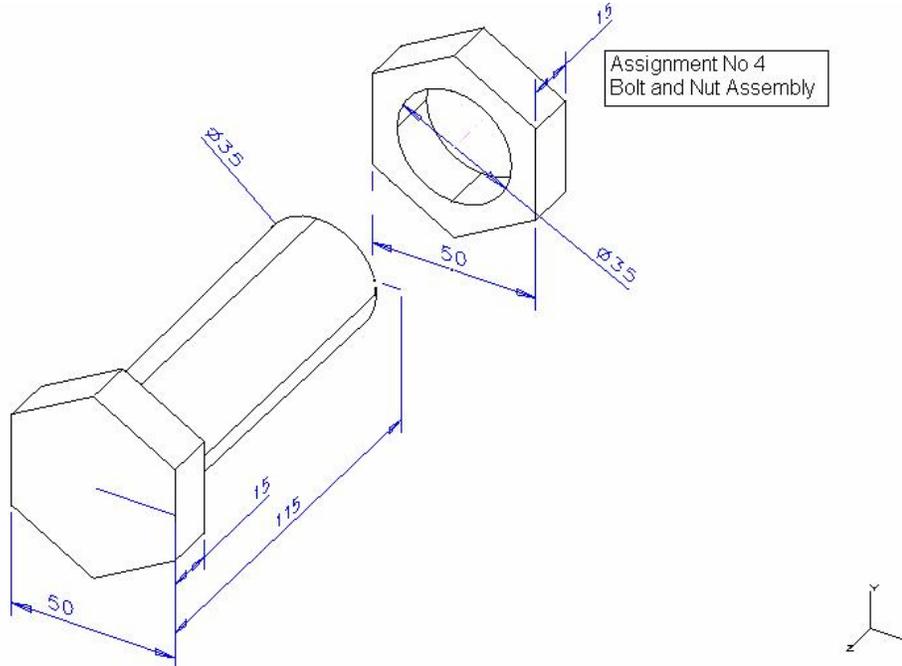


Figure 1

Introduction:

An **assembly** is a modeling entity that combines parts into a hierarchical product structure. We can assemble any collection of parts from the workbench, bins, and libraries.

An **assembly hierarchy** is a way to organize the collection of parts. A **part** contains geometry definition and other attributes such as color and mass properties. An **instance** in an assembly is not a copy of a part; it is like a “virtual image” of the part used in the assembly. An instance refers back to the part (stored in the bin) for its geometry definition and other attributes. Because an instance only displays the part in different locations in an assembly, without storing multiple copies of the geometry, it more efficiently uses data storage than if you made multiple copies of the part.

Bins are storage containers similar to drawers in a desk. They are valuable tools that help organize and manage parts.

Procedure:

The main assembly procedure involves the following steps:

- Create a bin, create parts and store in this bin
- Define assembly hierarchies
- Get instances of the stored parts

- Align the parts with axis, face edge etc
- Create dimensions and edit dimensions to move the parts along the aligned direction

1. create the bolt of given dimension as shown in figure2-3

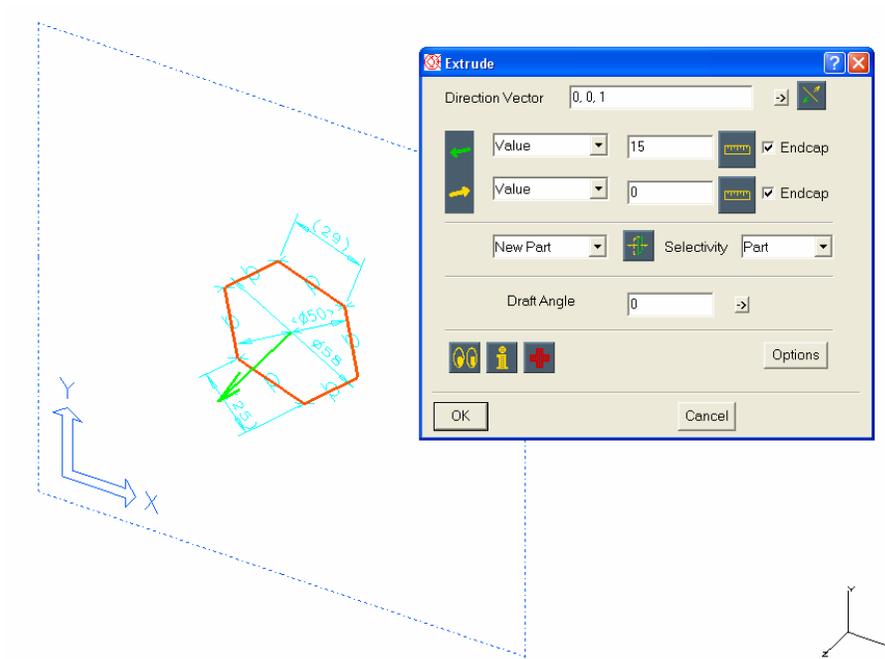


Figure 2: Create a polygon

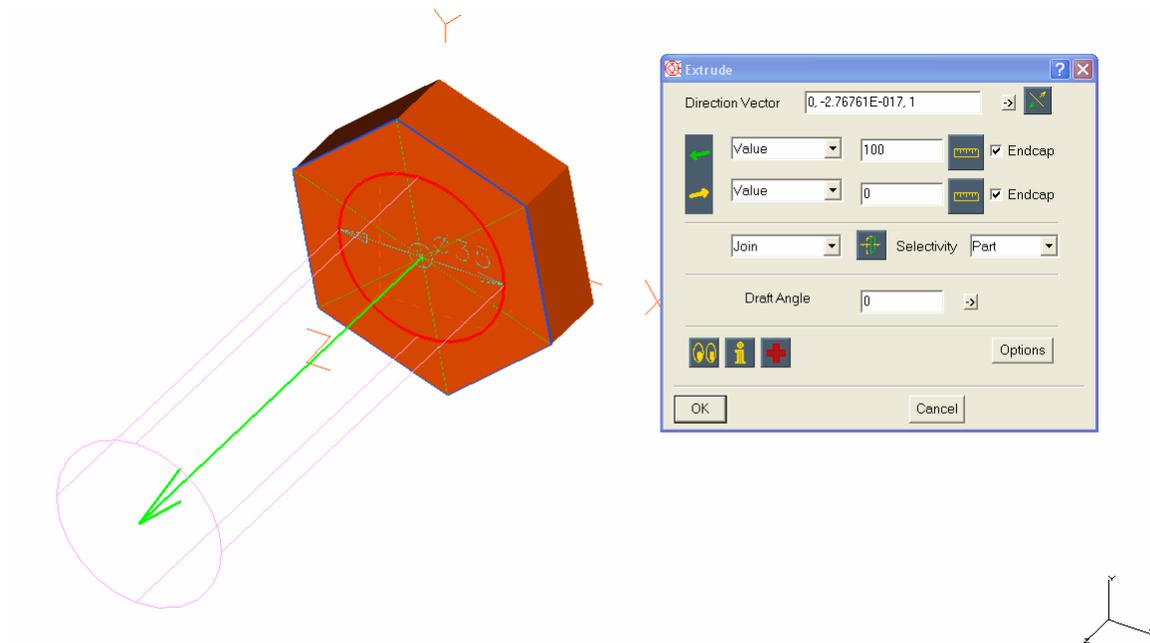


Figure 3: Extrude the polygon to make the bolt head

3. Name the part as *bolthead* as shown in figure 3.
4. Sketch a circle and extrude to make a bolt and name it as *boltbody* as shown in figure 4. (don't worry about bolt head being there)

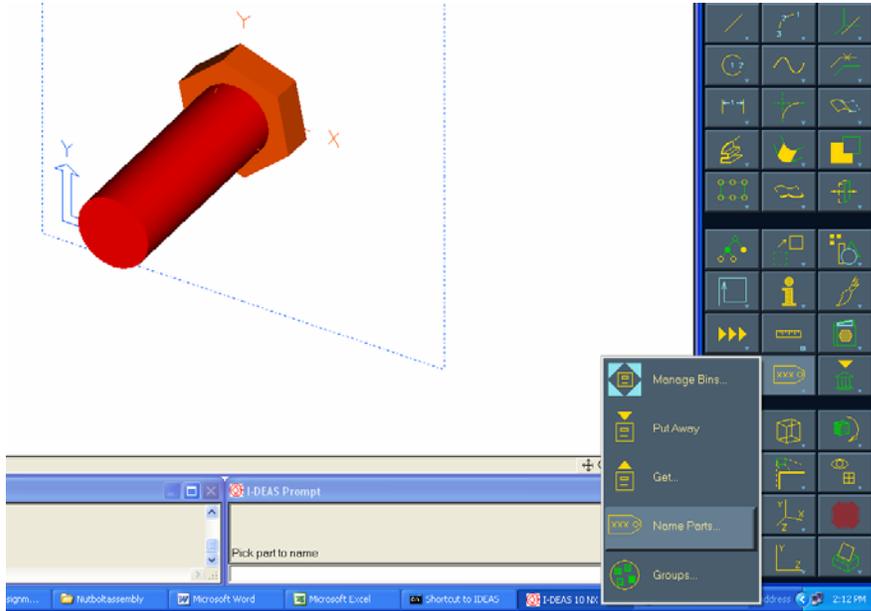


Figure 4

5. Create a bin called 'mybin' using Manage Bins icon and Put Away all the parts created in the bin by clicking on them or selecting with a window as shown in figure 5 -6.

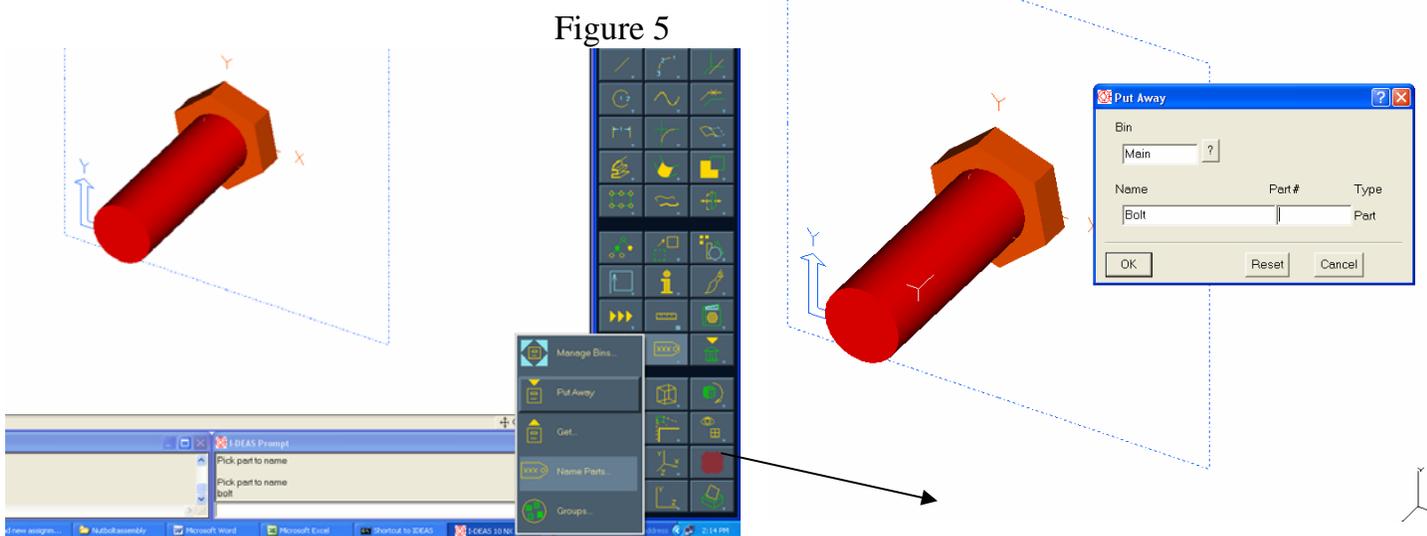
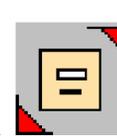


Figure 5

Figure 6. Saving the created parts in the bin

6. Model the Nut with given dimension

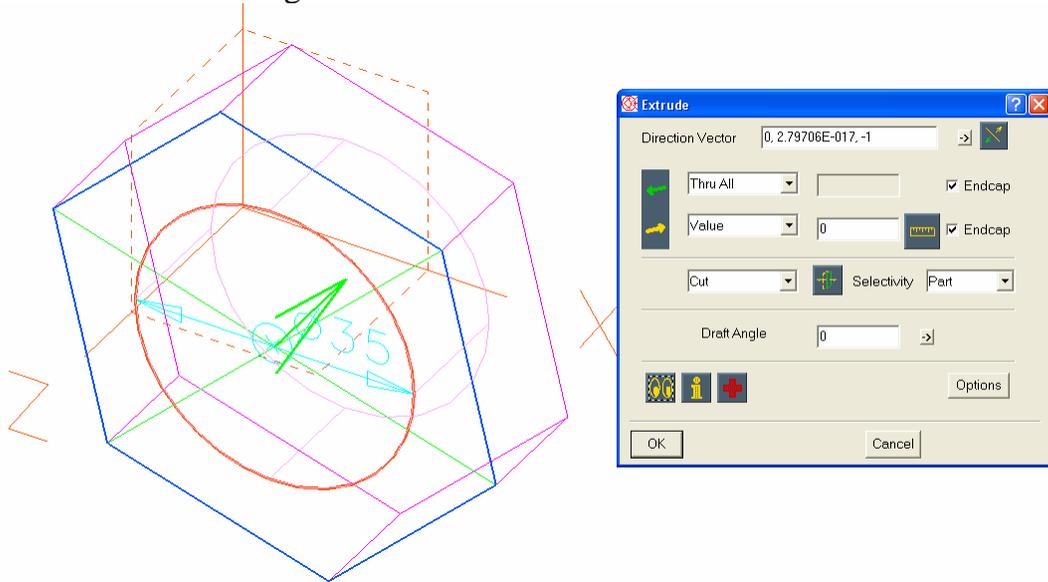


Figure 7

7. Name the part as *nut* and Put Away the same in bin as shown in Figure 8

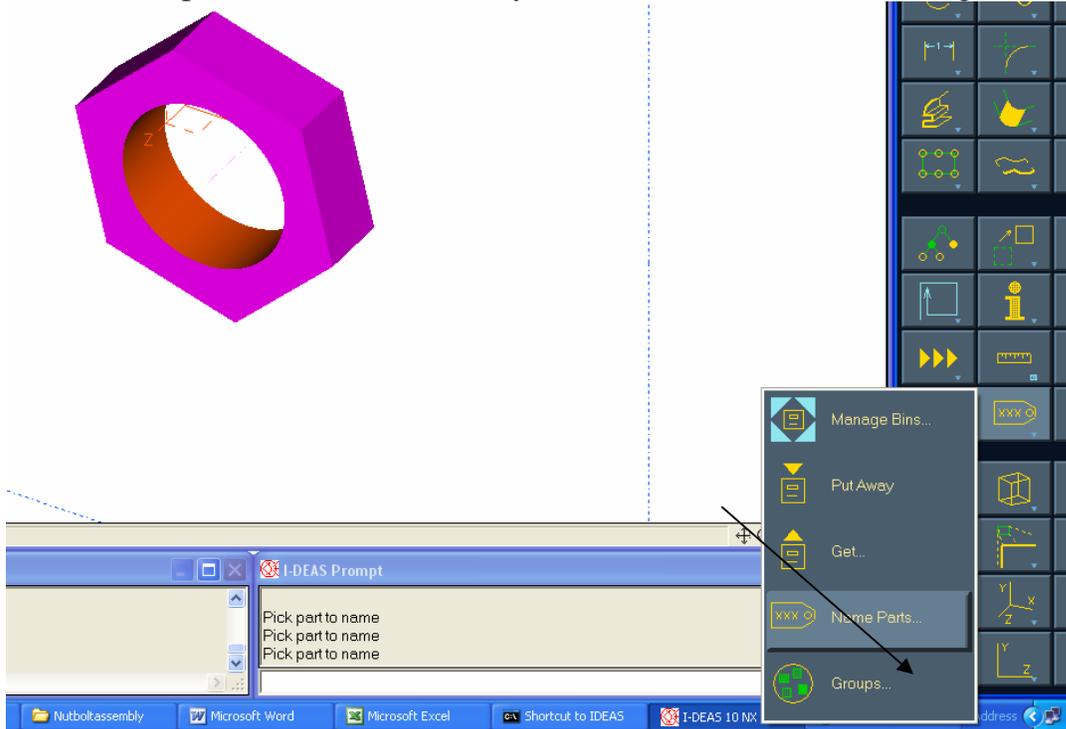


Figure 8: Creating the nut

8. Change the task to Master Assembly to create a Hierarchy called *boltassembly* and add *instances* of parts from the bin as shown in figure 9 -10

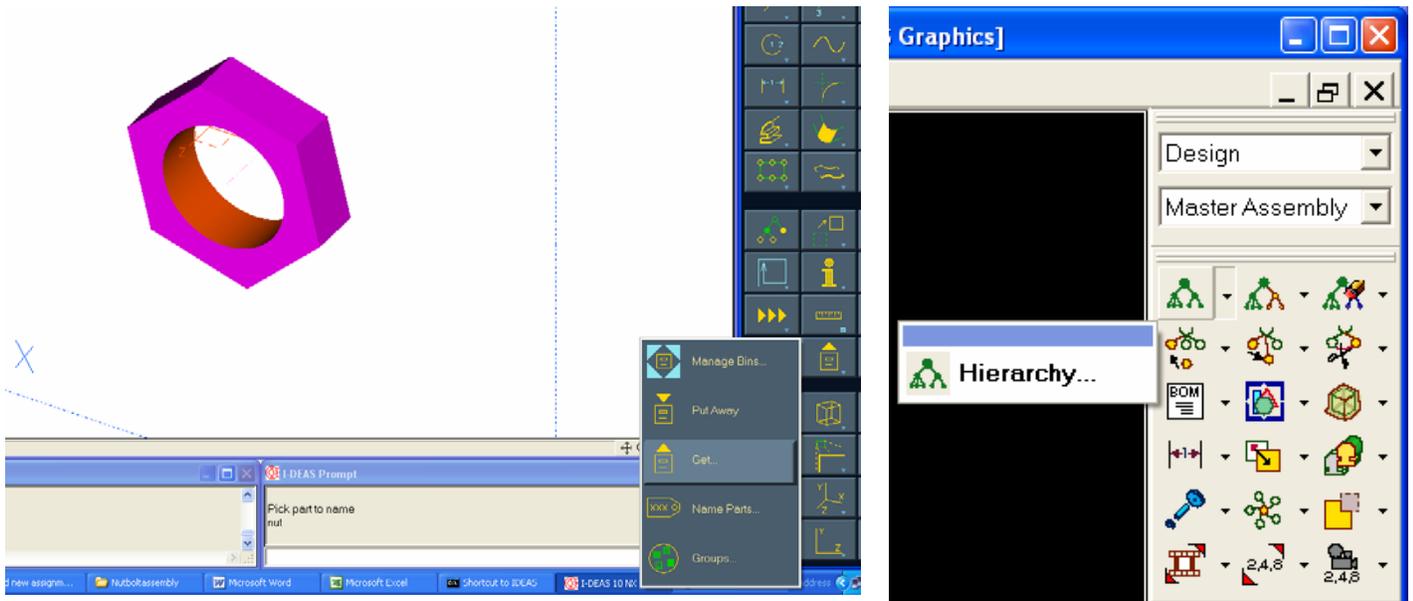


Figure 9: Hierarchy and instances

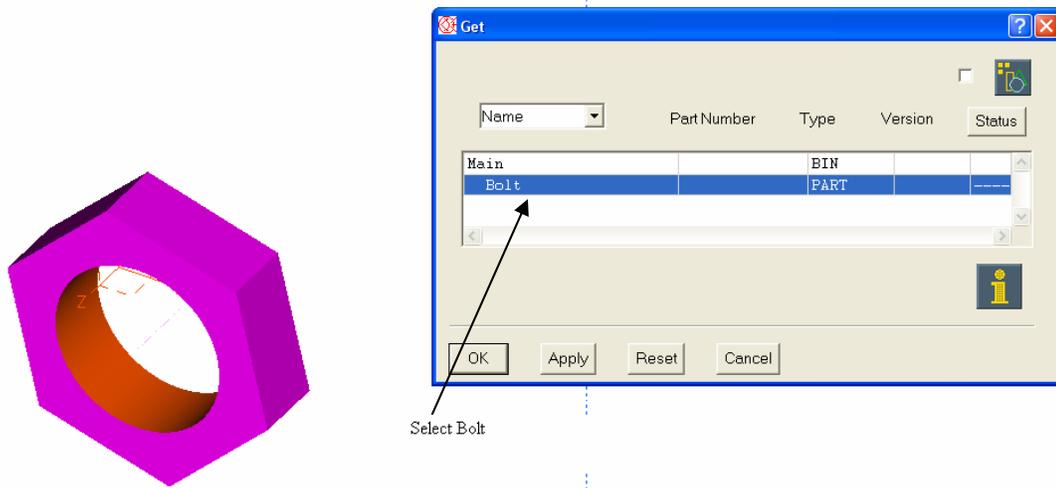


Figure 10

9 Using axis of bolt and bolt head align the part instances (See figure 11)

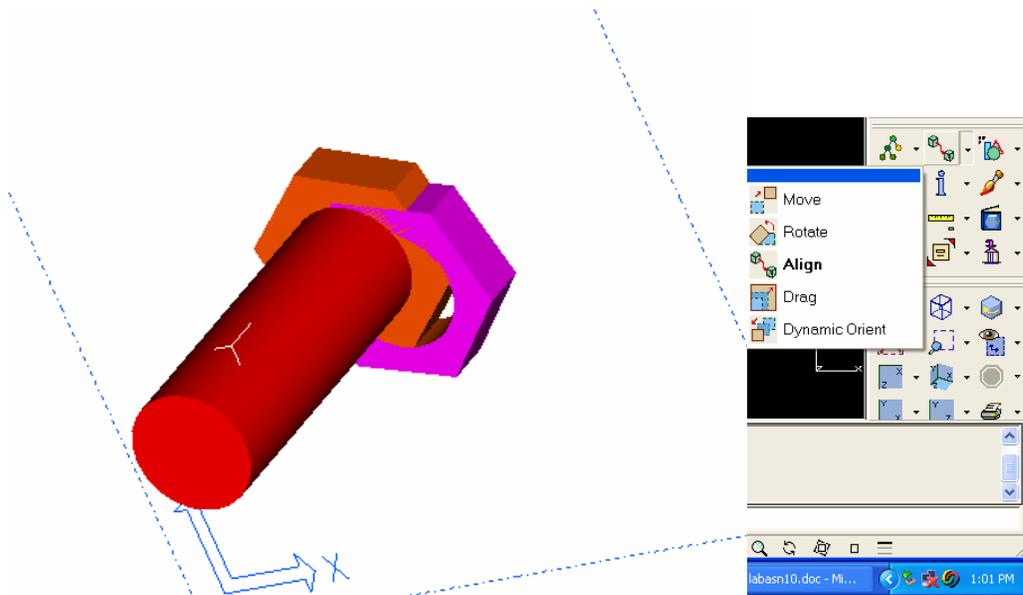


Figure.11

9a. Align both the features using “Align” as shown in figure 12.

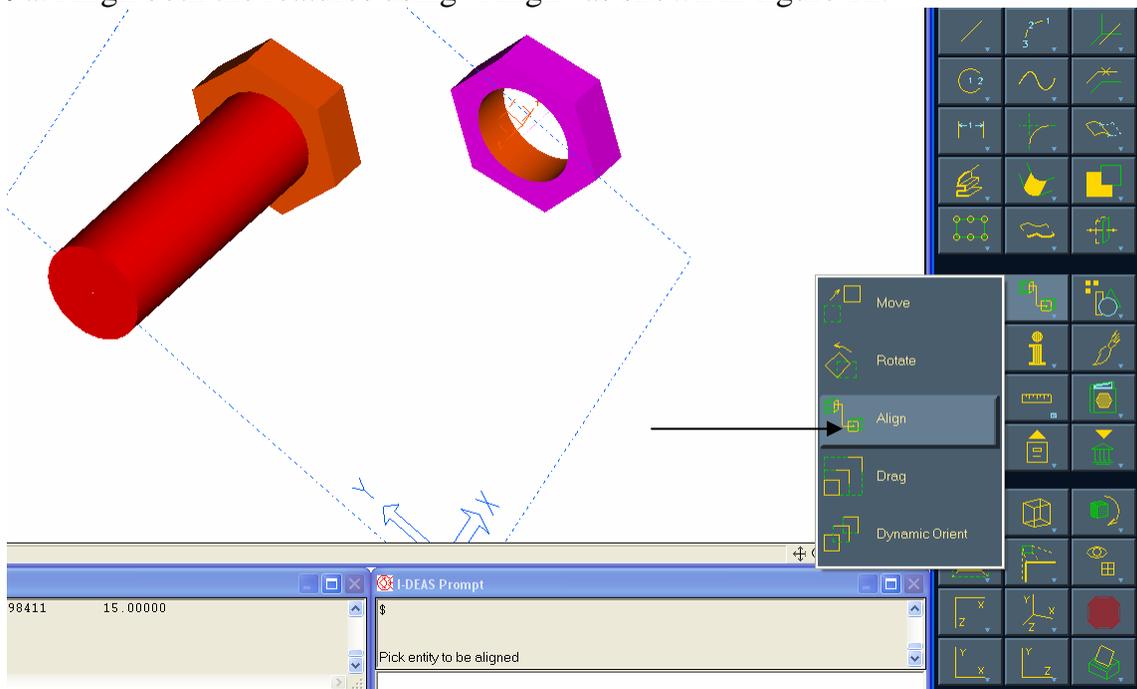


figure 12.

10. Select the movable entity as nut and the select the flat face of nut and bolt to align them.

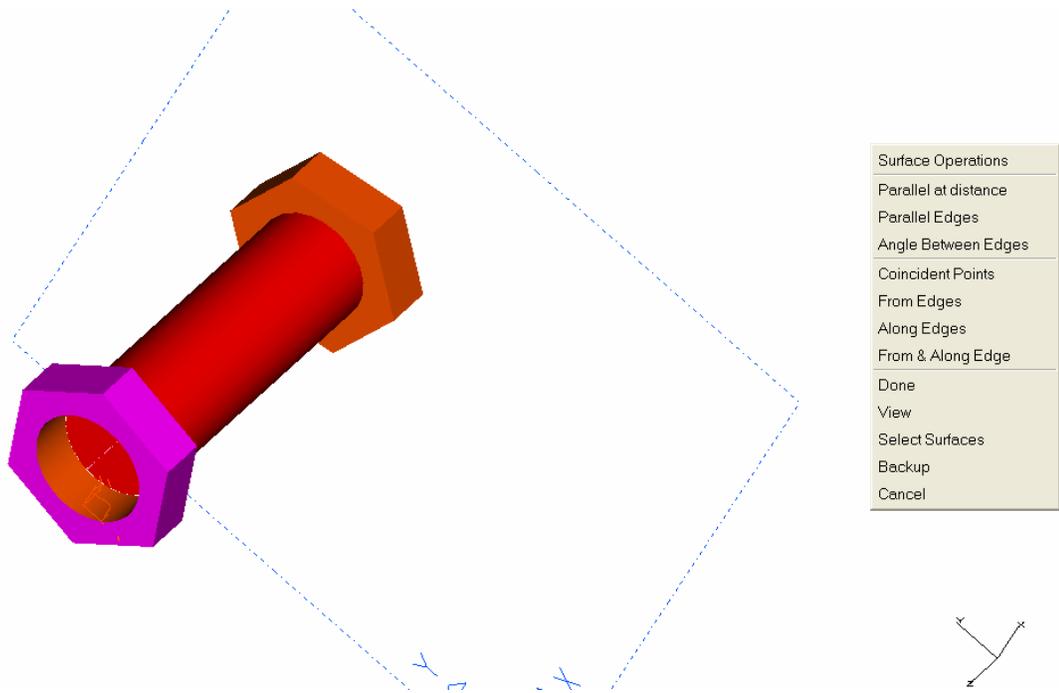


Figure 13

11. Align the nut with the bolt. Create dimension and edit it to align along the axis.

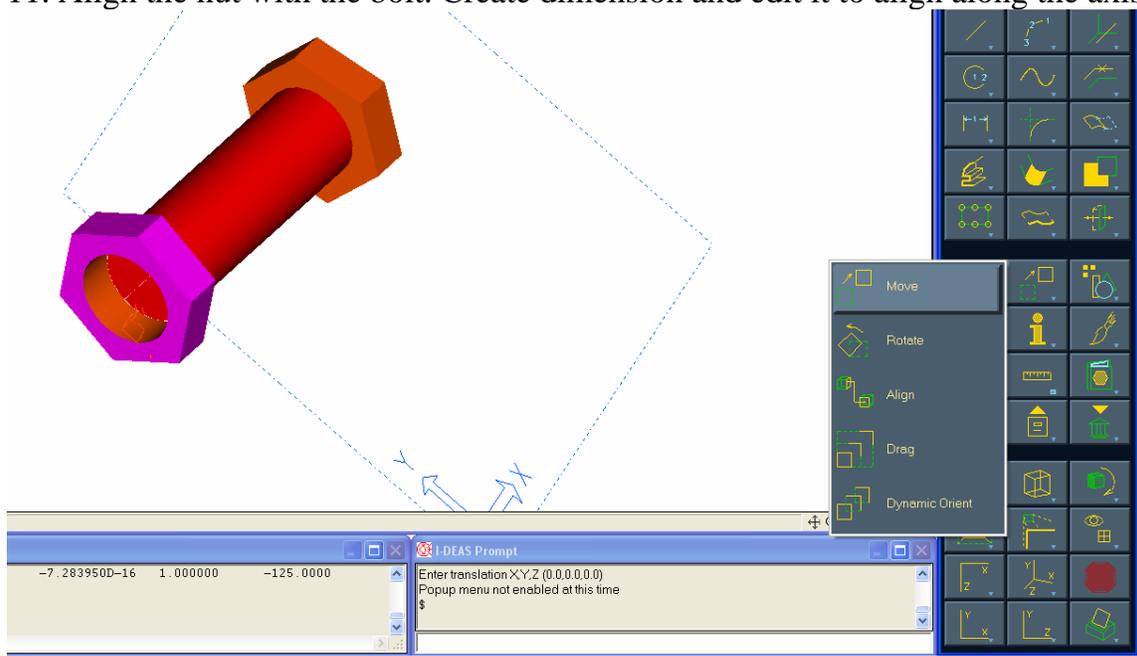
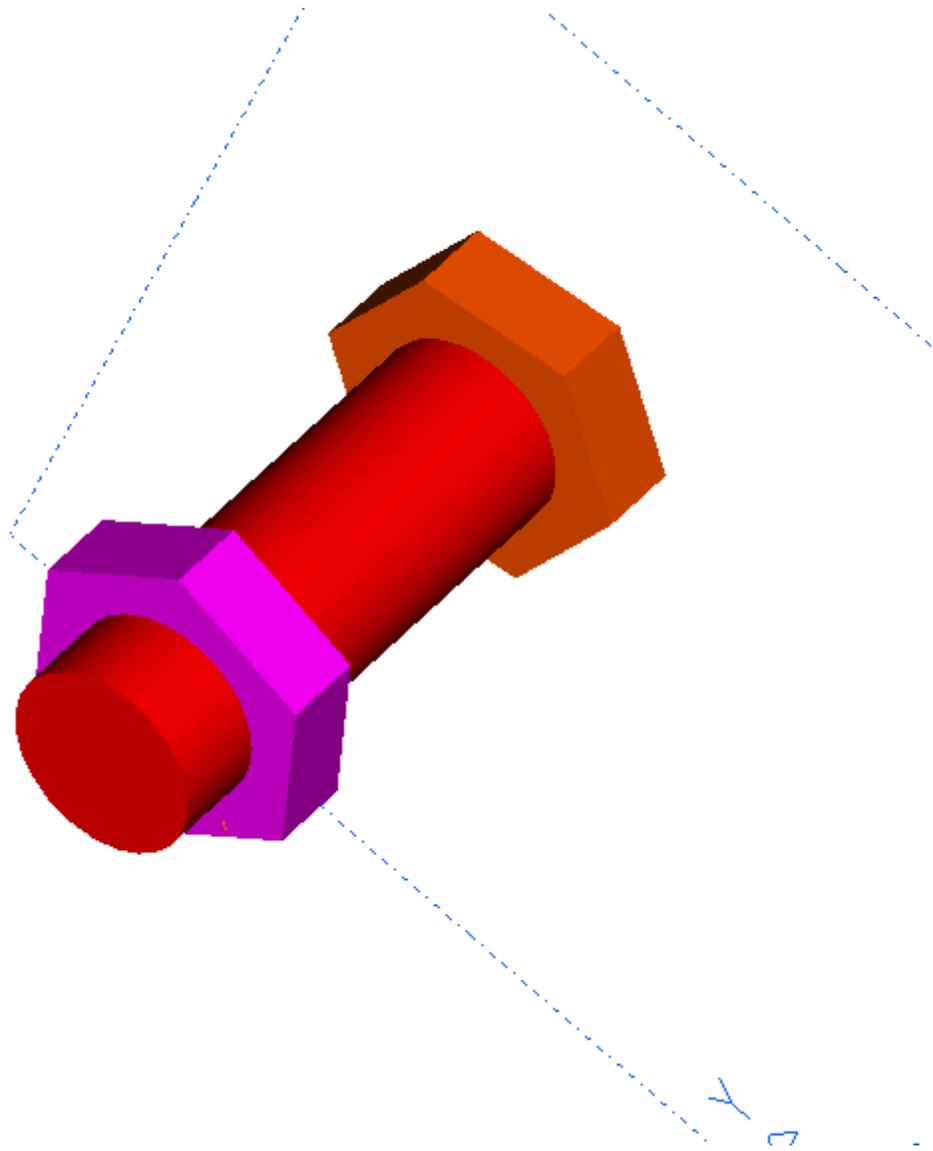


Figure 14.

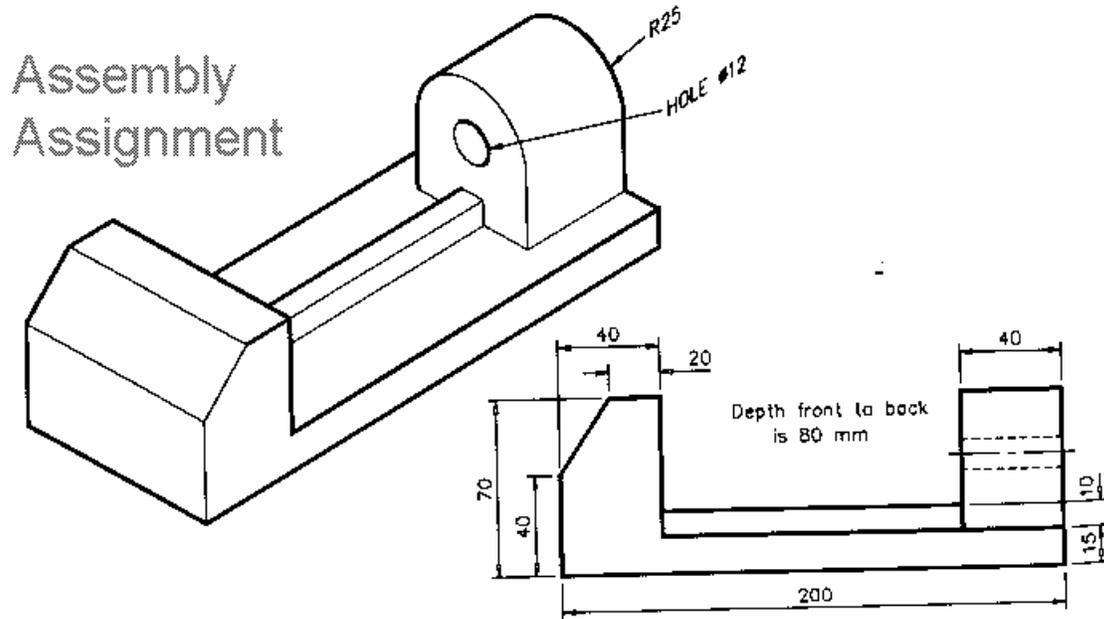
13. Final assembly is shown in figure 15



PART II: Assembly Exercises

Complete the following two assembly exercises on the lines of the assembly steps done in Part I above.

Assignment 10a



Assignment 10b.

Assignment No.8
Assembly Example 1

