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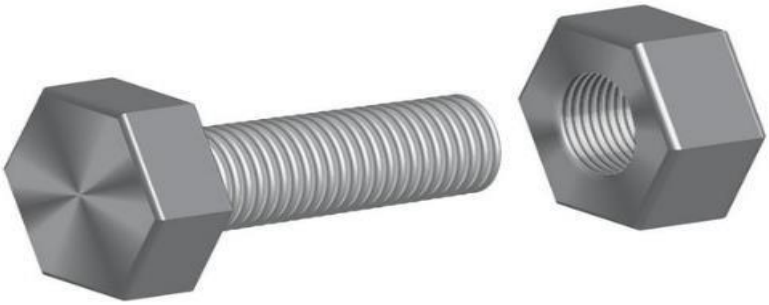
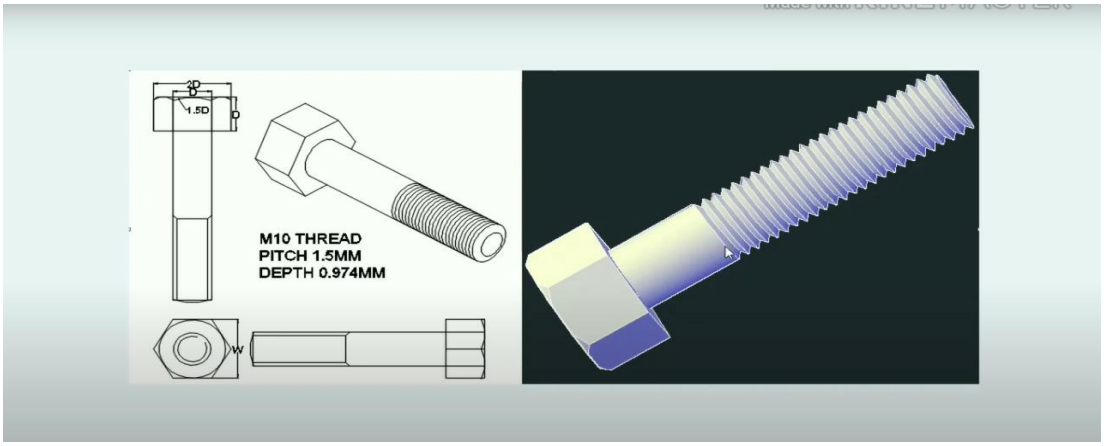
3-D BOLT AND NUT WITH THREADS

1. INTRODUCTION:

A bolt is a cylindrical fastener with a threaded shaft and a head at one end. The head is typically hexagonal or squared-shaped and it provides a gripping surface for a wrench or a socket . The threaded shaft is the part of the bolt that screws into a matching threaded hole to secure two or more objects together .A nut is a small, hexagonal or squared-shaped fastener with a threaded hole in the center it is used in combination with a bolt to fasten two or more objects together The nut is placed on the threaded shaft of the bolt and tightened with a wrench or a socket to secure the objects in place .The threads on a bolt and a nut are a series of grooves or ridges that are cut into the surface of the shaft or the hole . The threads are designed to interlock with each other when the bolt is screwed into the nut, creating a tight , secure fit .To create a 3D model of a bolt and nut with threads . You would need to use a 3D modelling software or a CAD program These tool allow you to create and manipulate 3D objects and add such as threads to your model.





2. AIM: To create the 2 D / 3 D drawing for SCREW AND BOLTS by using AutoCAD commands.

3. OBJECTIVES: Easy to draw the given object.

4. SOFTWARE REQUIRED: Auto CAD 2024

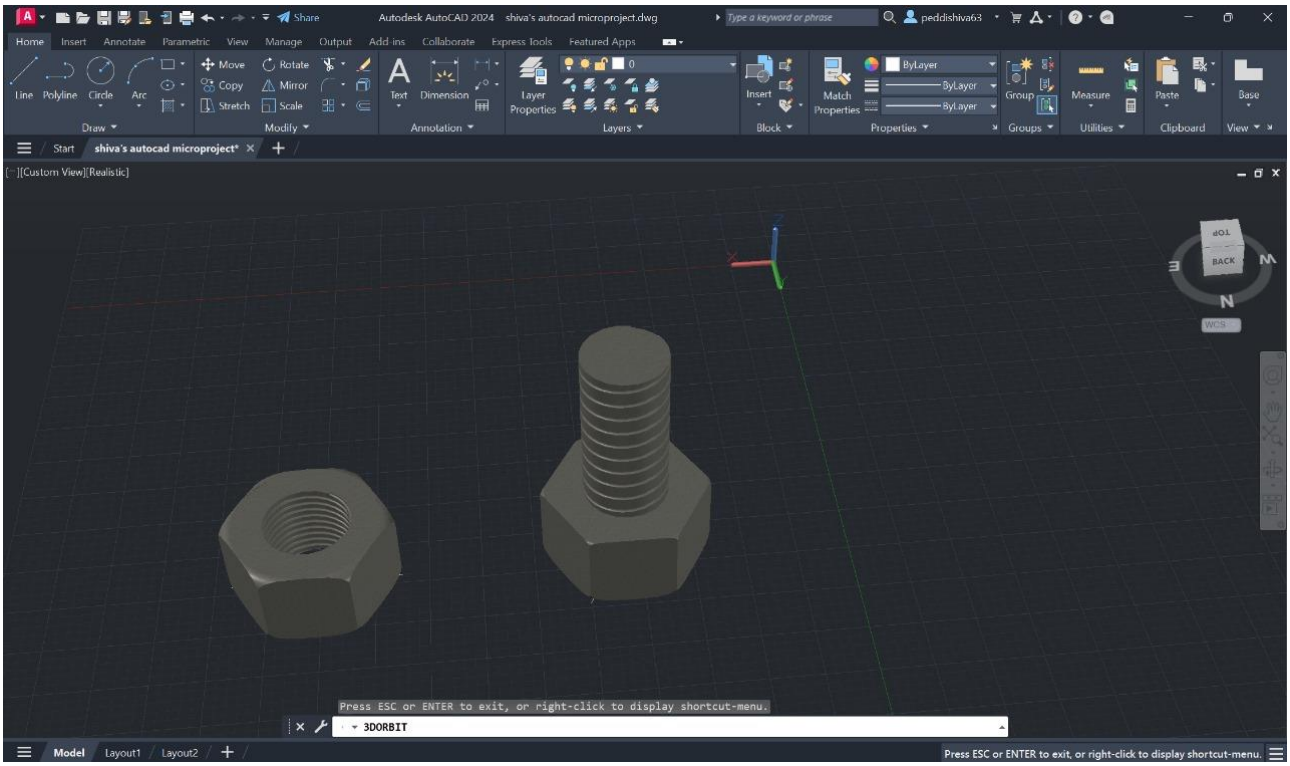
5. COMMANDS USED:

1. LIMITS
2. UNITS (LIN)
3. DIM STYLE (D)
4. ZOOM (Z) + ALL (A)
5. PTYPE
6. POINT (PO)
7. LINE (L)
8. OFFSET (0)
9. DTEXT (DT)
10. MTEXT (MT)
11. TRIM (TR)
12. CIRCLE (C)
13. COPY (C0 or CP)
14. MOVE (M)
15. POLYLINE CPL)
16. POLIGON (PO)
17. EXTRUDE (EX)
18. SUBSTRACT (SUB)
19. INTERSECT
20. HELIX
21. SWEEP
22. UNION (UN)
23. MAT

6. PROCEDURE:

- Open the Auto CAD window.
- Set the required limits and grids.
- By using the F3 key (OSNAP command), the dialog box will be open and select the end point, midpoint etc.
- By using the F8 key, the ortho is ON.
- By using DD CUPS command, the UCS (User Coordinate System) dialog box will be open and select the required view.
- Draw the different parts of the detailed drawing for the SCREW AND BOLTS by using draw and edit commands.
- By using line command, join all parts of detailed drawing.
- By using hatch command, the required portion of drawing was hatched

7. RESULT:



Auto CAD Diagram

Thus, the given SCREW AND BOLTS is drawn by using Auto CAD commands as per Sketch.

8. PRECAUTIONS FOR PERSONAL AND SYSTEM SAFETY:

- Students are not allowed to move, change or replace any computer peripheral.
- Students should exit all programs and return to the window desktop before leaving the computer UPS is used.

9. APPLICATION OF THE SKILL IN PROFESSIONAL LIFE:

- Engineering Design
- Construction
- DIY project
- Aerospace Industry
- Maintenance and Repair
- Educational Purpose

10. CONCLUSION:

The 3D model of the nut and bolt in AutoCAD is a precise representation with realistic threads and features, ensuring interchange ability and compatibility .It allows visualization, collaborative design , and easy modifications. This accurate model serves as a valuable blueprint for manufacturing considering mechanical properties and optimizing for specific applications . In 100 words, the conclusion highlights the model's reliability, efficiency, and effectiveness in aiding the development and implementation of these essential mechanical components.

11. REFERENCES :

- An introduction to the classic paper "Structural Steel Design" which was written by Jack McCormac and Stephen F.Csernako of Nut and Bolt and cover a board range of mechanical Design including drawings and engineering documentation.
- "Bolted Joint Engineering"by John H.Bickford and Sayed Nassar of Nut and Bolt delves into the engineering principles and pratices related to bolted joints.
- "Design of Steel Structures" of Nut and Bolt by Edwin H. Gaylord, Charles N. Gaylords, and James E.Stallmeyer.
- "Use and application of high-performance steels for steel structures" of Nut and Bolt ,structural engineering Documents No 8 Published by IABSE Oct 2005.