Assignment 2

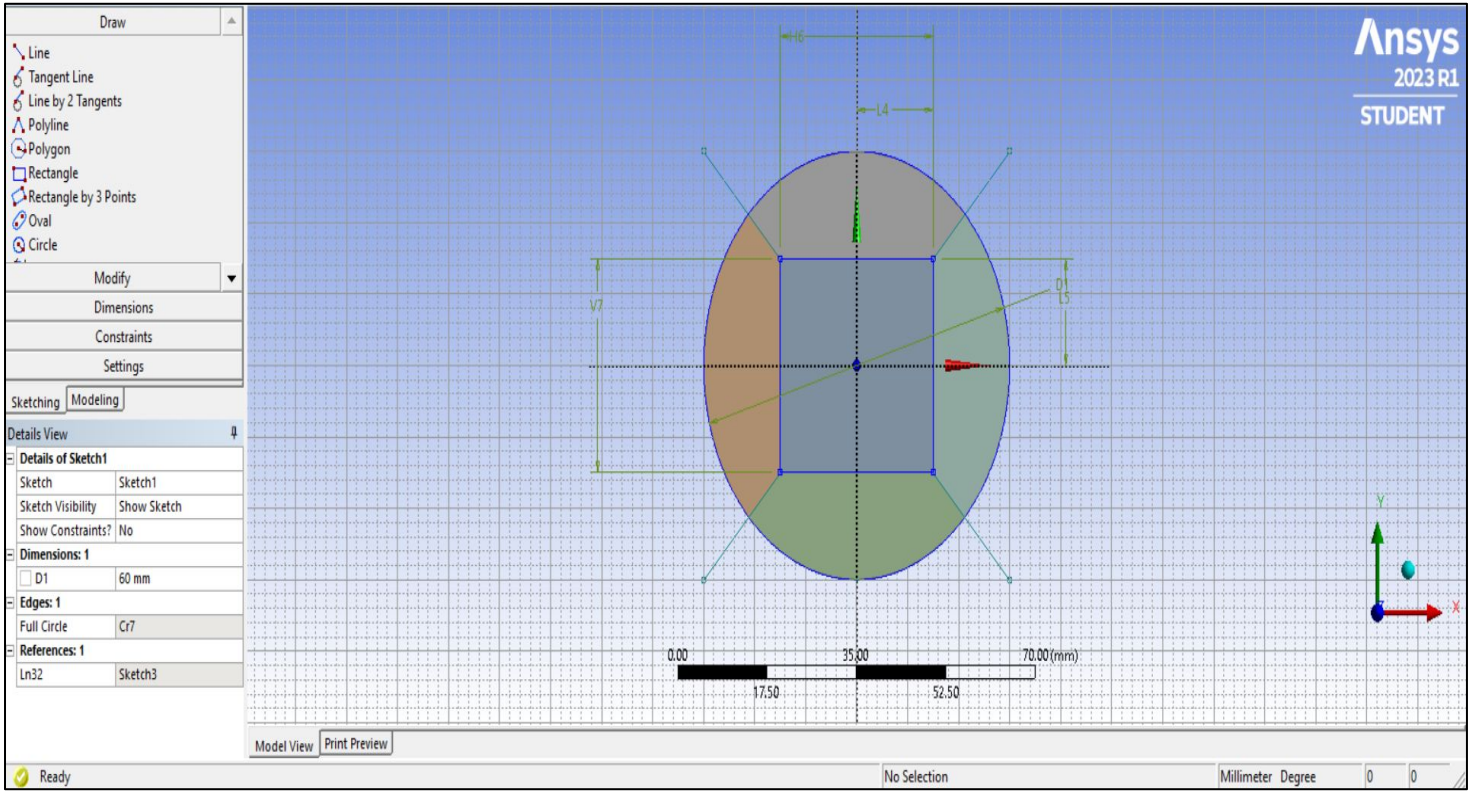
-Keshav Kothari

Questions 1 - Mesh the Geometry

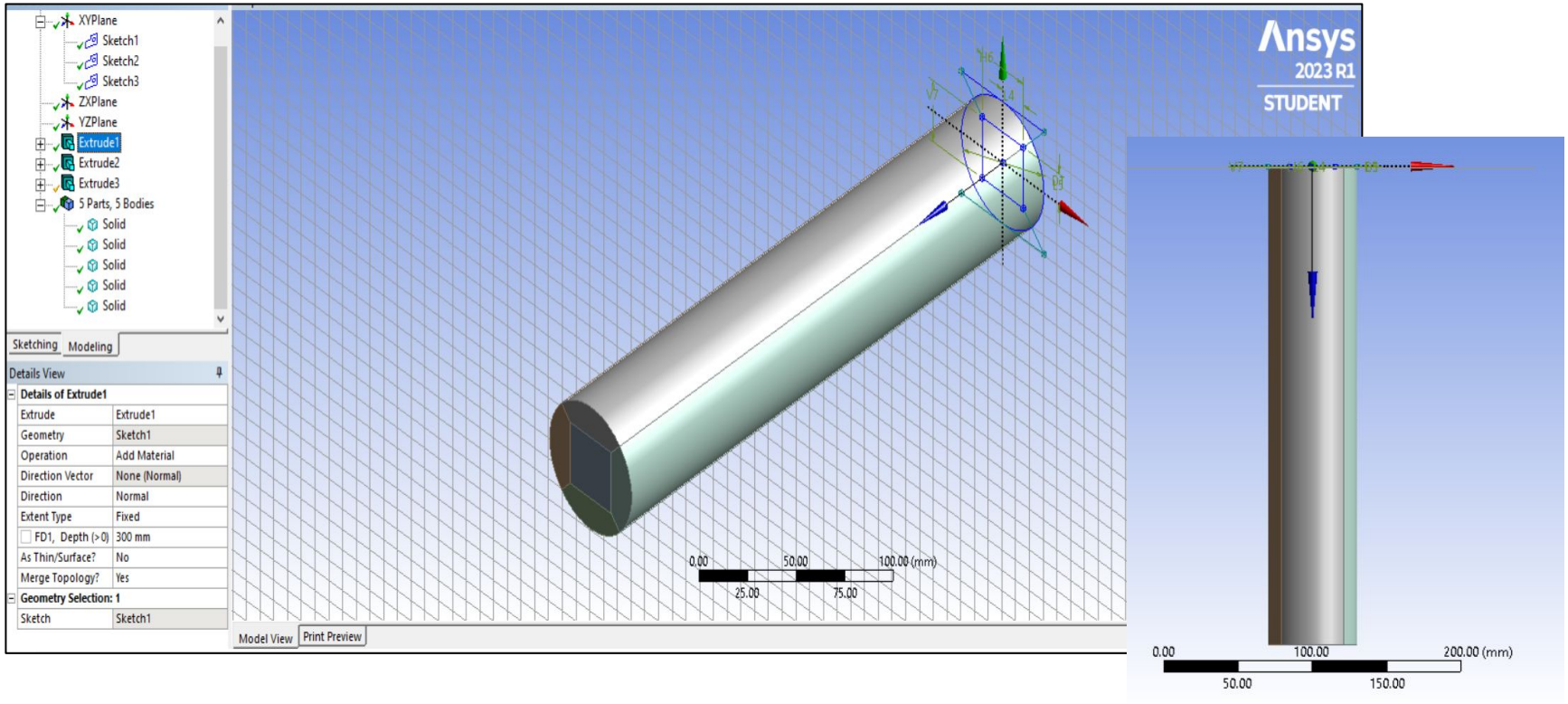
Geometry Detail’s • Mesh the cylindrical PIPE as per the given instructions

- Dimension for PIPE 1. Diameter of pipe= 60mm 2. Length of pipe= 300mm
- Meshing Details
  1. Meshing Methods= Tetrahedrons (Patch Conforming)
  2. Body Sizing
  3. Element Size= 2mm
- Inflation layer
  1. Max layer=10
  2. Growth-rate=1.2
-

Front view

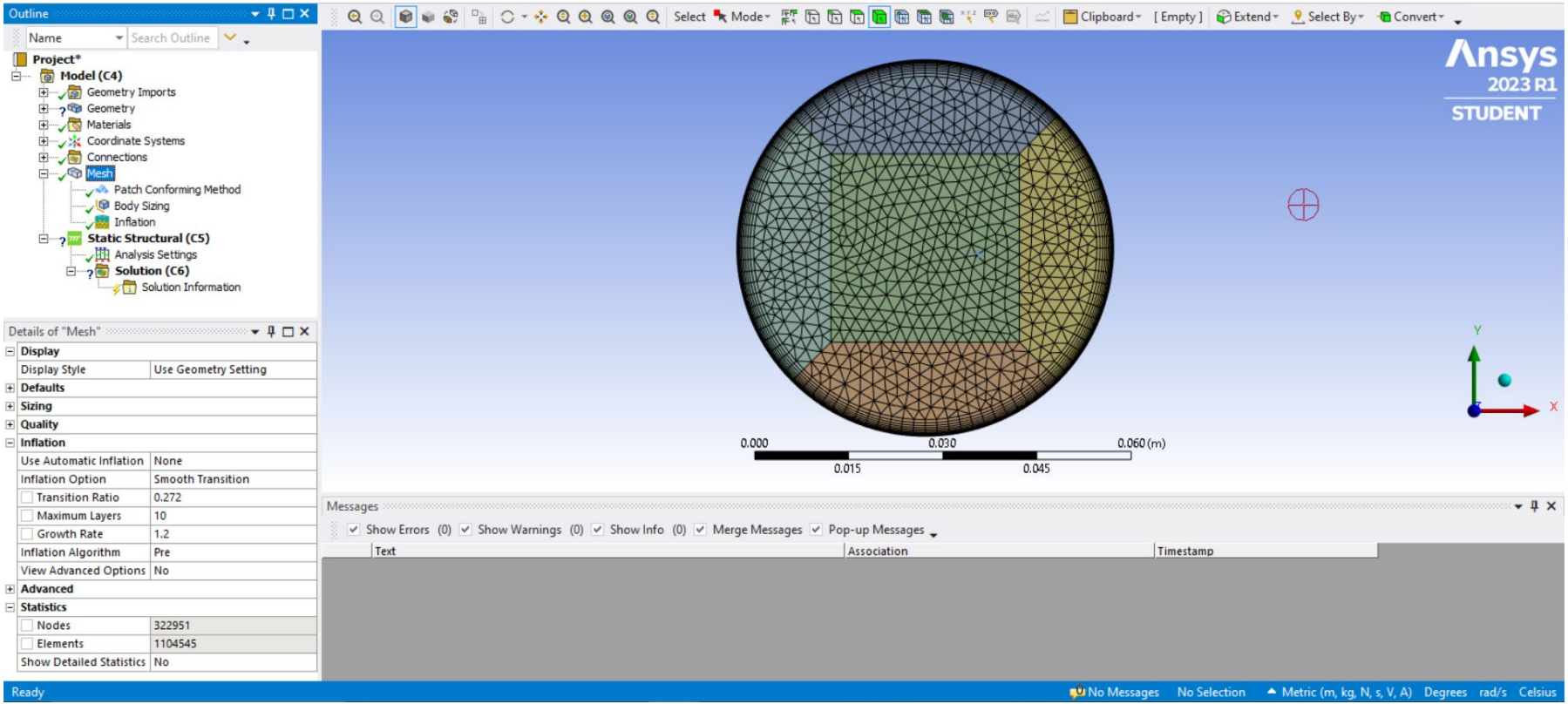

Draw
Line
Tangent Line
Line by 2 Tangents
Polyline
Polygon
Rectangle
Rectangle by 3 Points
Oval
Circle
Modify
Dimensions
Constraints
Settings
Sketching
Modeling
Details View
Details of Sketch1
Sketch
Sketch1
Sketch Visibility
Show Sketch
Show Constraints?
No
Dimensions: 1
D1
60 mm
Edges: 1
Full Circle
Cr7
References: 1
Ln32
Sketch3
H6
L4
V7
D1
L5
0.00
35.00
70.00 (mm)
17.50
52.50
Ansys
2023 R1
STUDENT
Model View
Print Preview
Ready
No Selection
Millimeter
Degree
0
0

Isometric view and top view (Extruded 300mm)

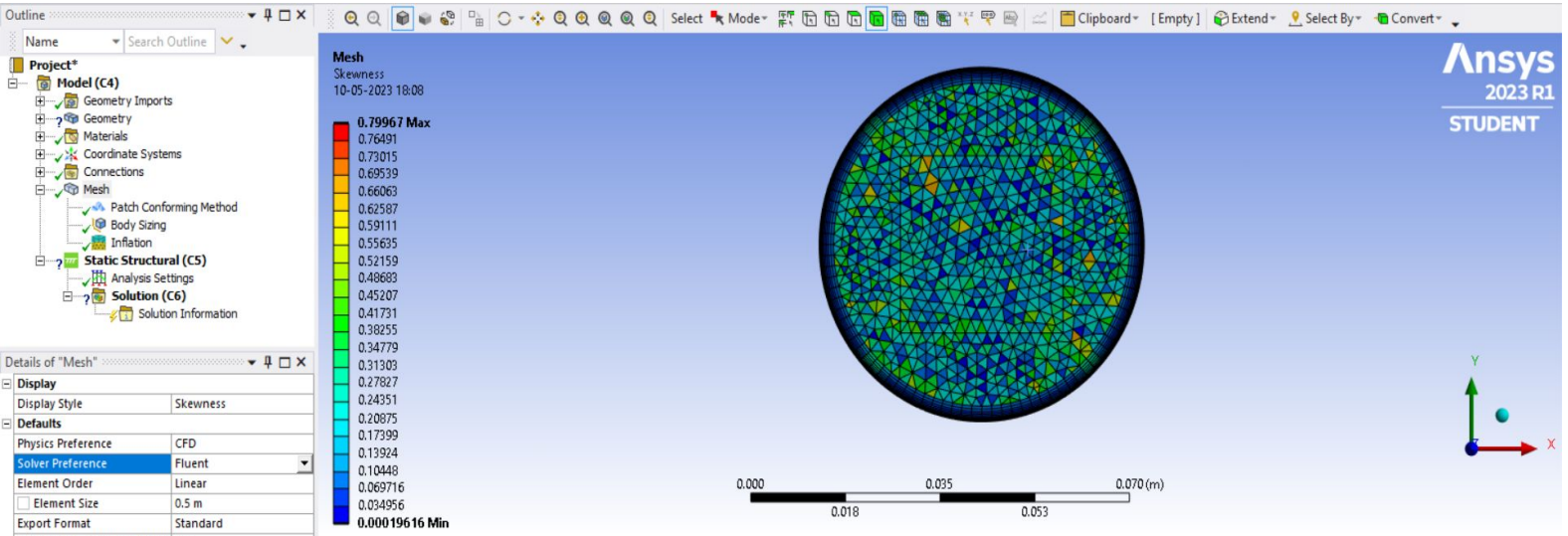


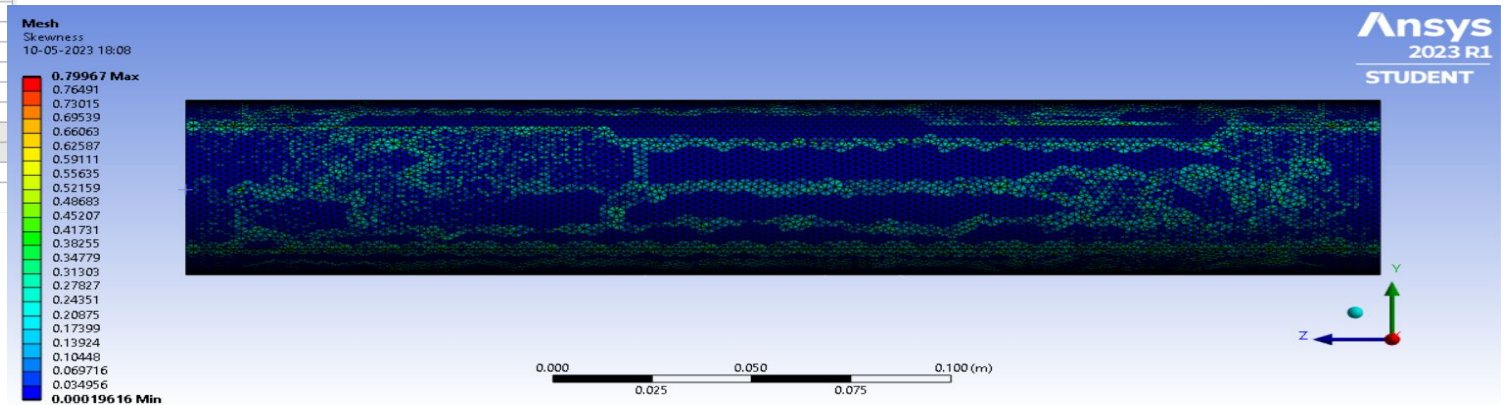
Meshing

Crossection with inflation

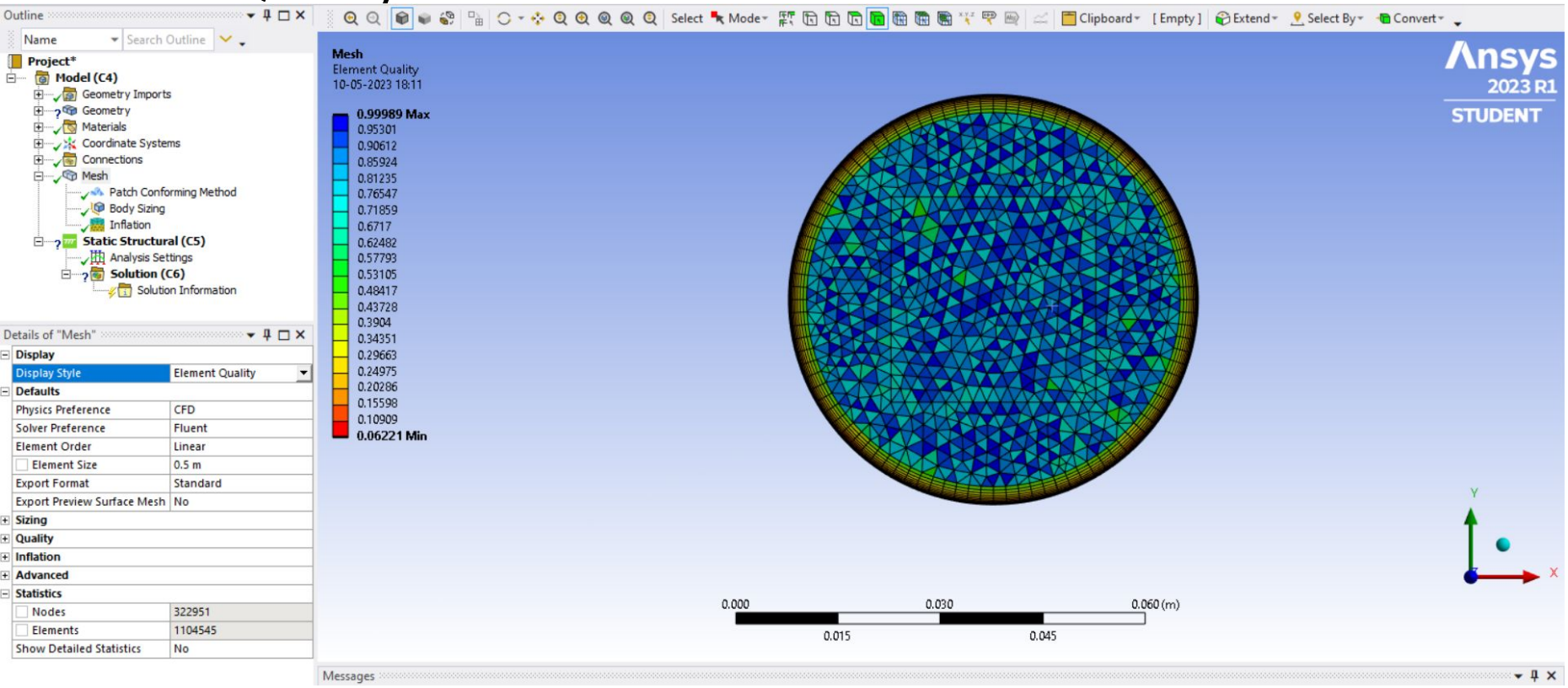


Skewness

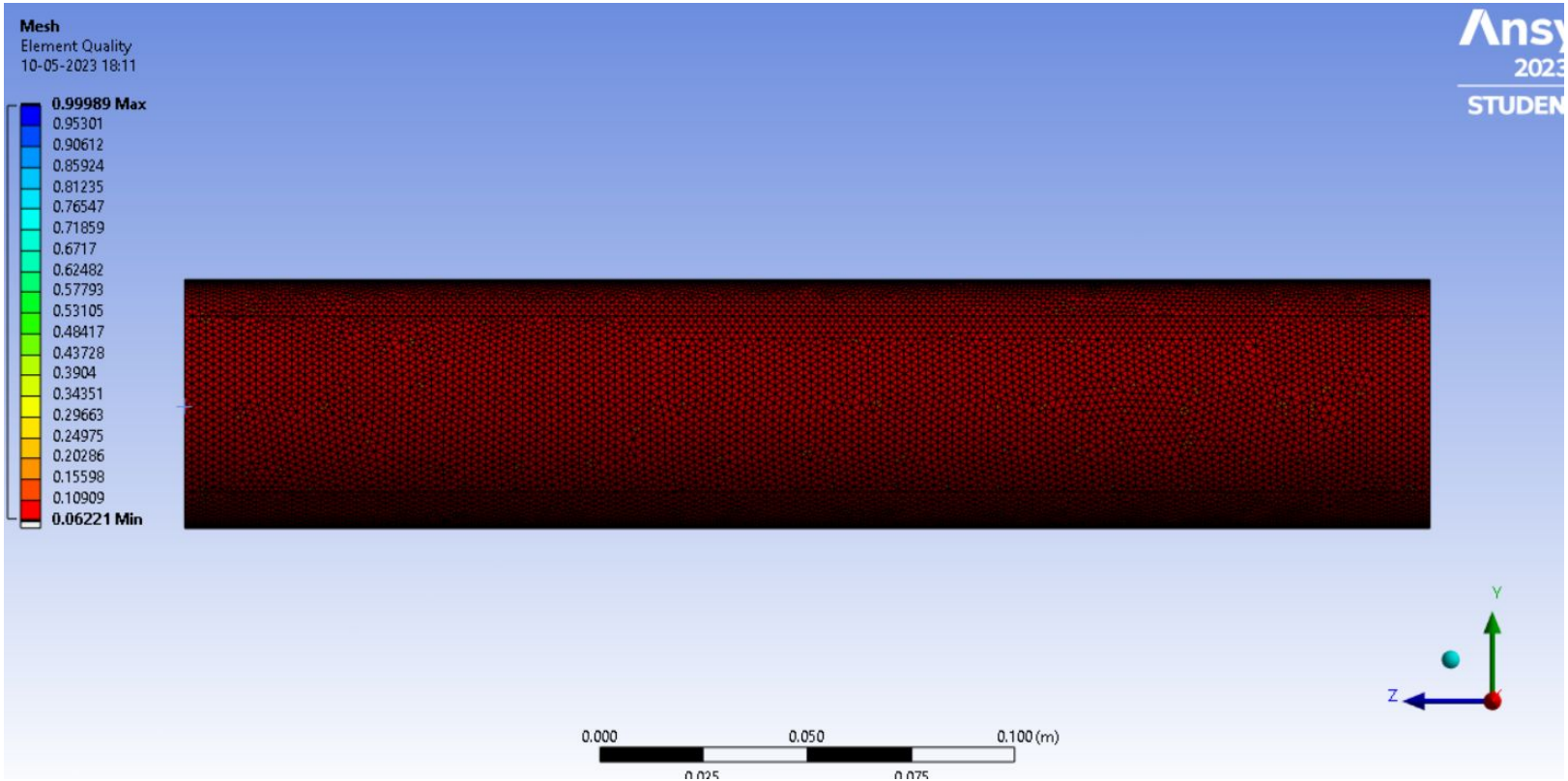

Outline
Name
Search Outline
Project*
Model (C4)
Geometry Imports
Geometry
Materials
Coordinate Systems
Connections
Mesh
Patch Conforming Method
Body Sizing
Inflation
Static Structural (C5)
Analysis Settings
Solution (C6)
Solution Information
Details of "Mesh"
Display
Display Style: Skewness
Defaults
Physics Preference: CFD
Solver Preference: Fluent
Element Order: Linear
Element Size: 0.5 m
Export Format: Standard
Export Preview Surface Mesh: No
Sizing
Quality
Inflation
Advanced
Statistics
Nodes: 322951
Elements: 1104545
Show Detailed Statistics: No
Select
Mode
Clipboard
[Empty]
Extend
Select By
Convert
Mesh
Skewness
10-05-2023 18:08
0.79967 Max
0.76491
0.73015
0.69539
0.66063
0.62587
0.59111
0.55635
0.52159
0.48683
0.45207
0.41731
0.38255
0.34779
0.31303
0.27827
0.24351
0.20875
0.17399
0.13924
0.10448
0.069716
0.034956
0.00019616 Min
Ansys
2023 R1
STUDENT
0.000
0.035
0.070 (m)
0.018
0.053
Y
X


Mesh
Skewness
10-05-2023 18:08
0.79967 Max
0.76491
0.73015
0.69539
0.66063
0.62587
0.59111
0.55635
0.52159
0.48683
0.45207
0.41731
0.38255
0.34779
0.31303
0.27827
0.24351
0.20875
0.17399
0.13924
0.10448
0.069716
0.034956
0.00019616 Min
Ansys
2023 R1
STUDENT
0.000
0.050
0.100 (m)
0.025
0.075
Y
Z

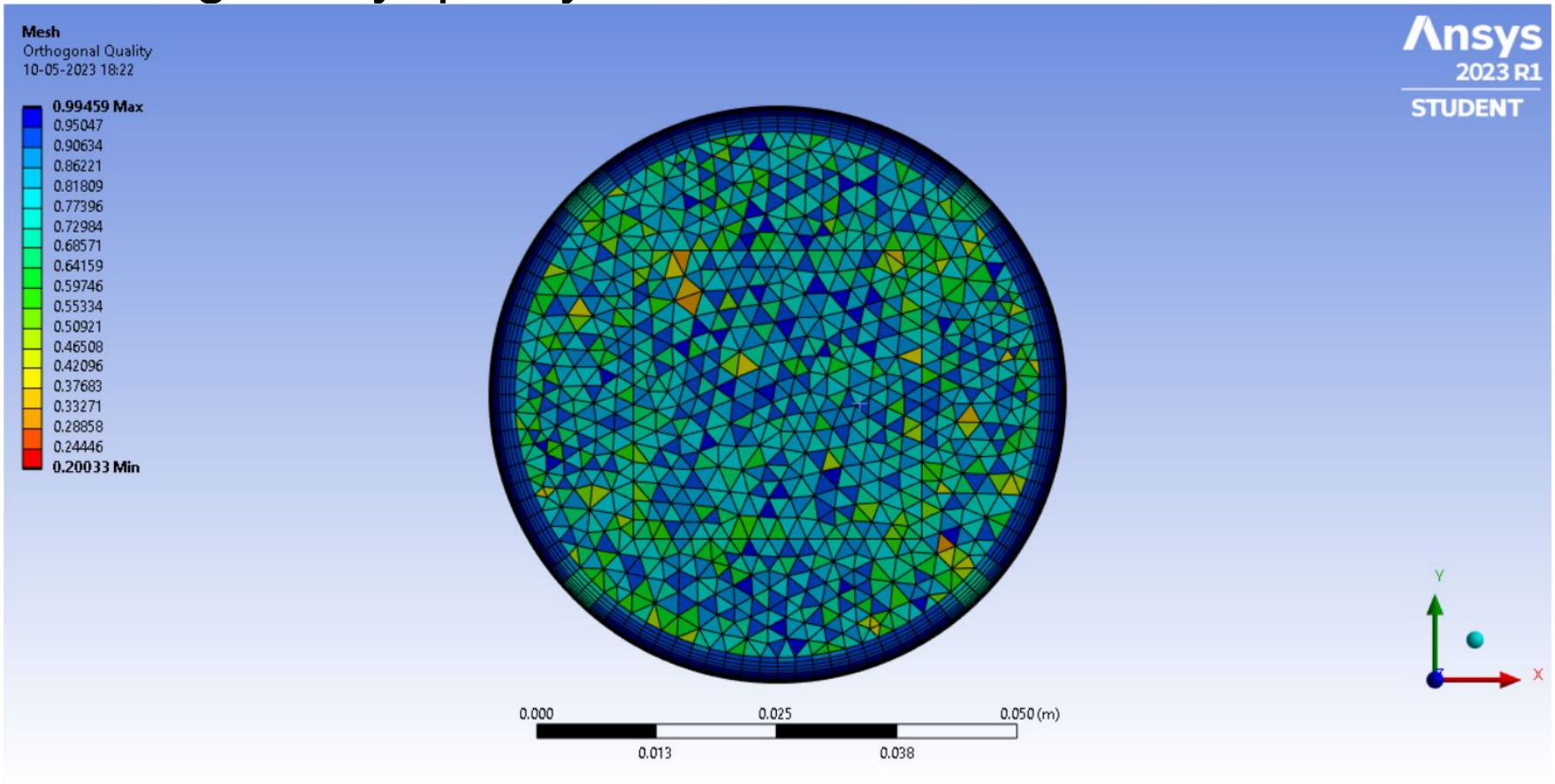
Mesh Quality



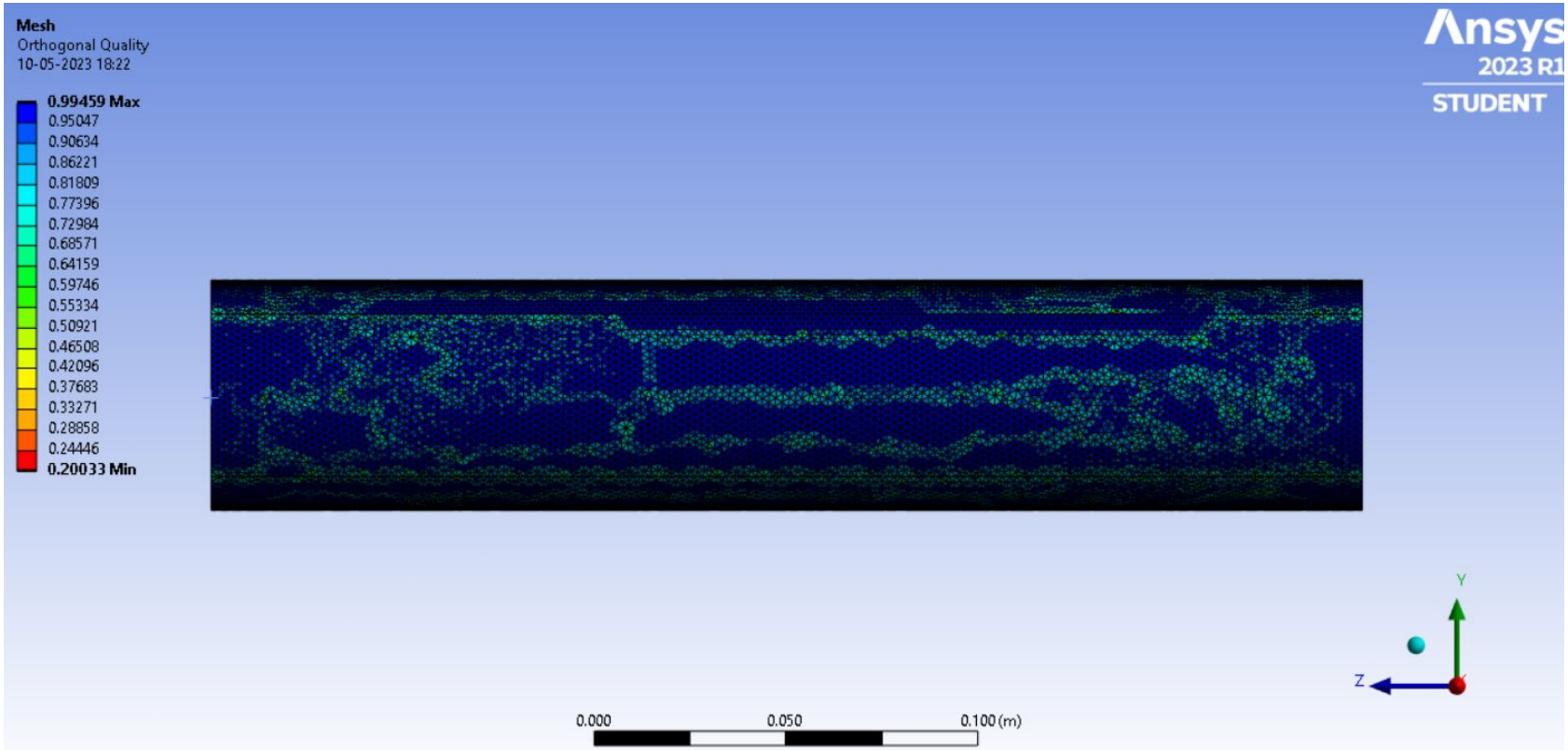
Mesh Quality



Orthogonality quality

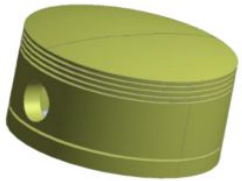


Orthogonality quality



Question 2

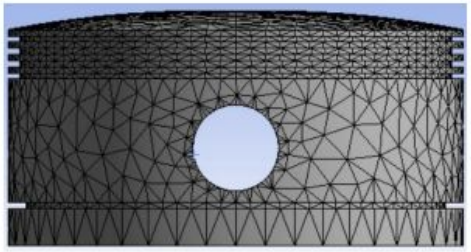
Geometry Detail's



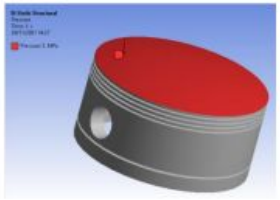
[*To get the geometry File*

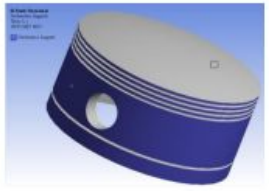
https://drive.google.com/file/d/1VLJqNQmGcD398NX9Lgy1V-7UaxRMQJZD/view?usp=sharing]

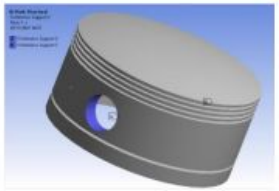
- **Meshing Details**
  4. Meshing Methods= Automatic
  5. Body Sizing
  6. Element Size= 3mm



- **Boundary Condition**
  3. Material – Structural Steel
  4. Pressure 5Mpa
  5. Frictionless support

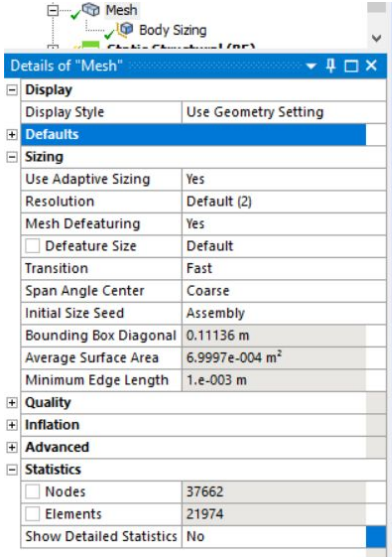






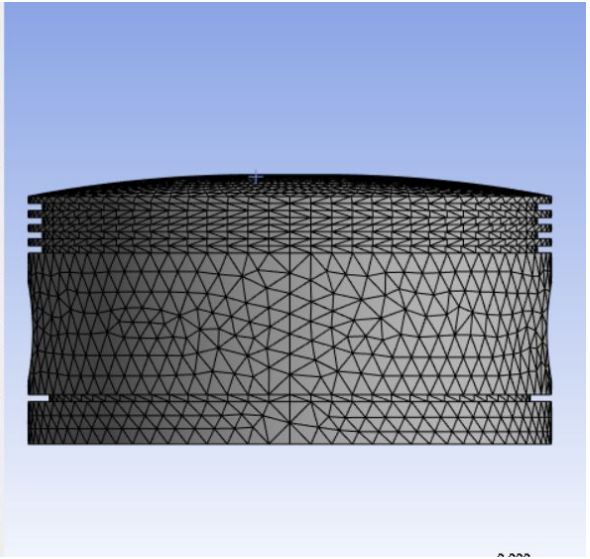
- **Results to find**
  6. Total Deformation
  7. Directional Deformation

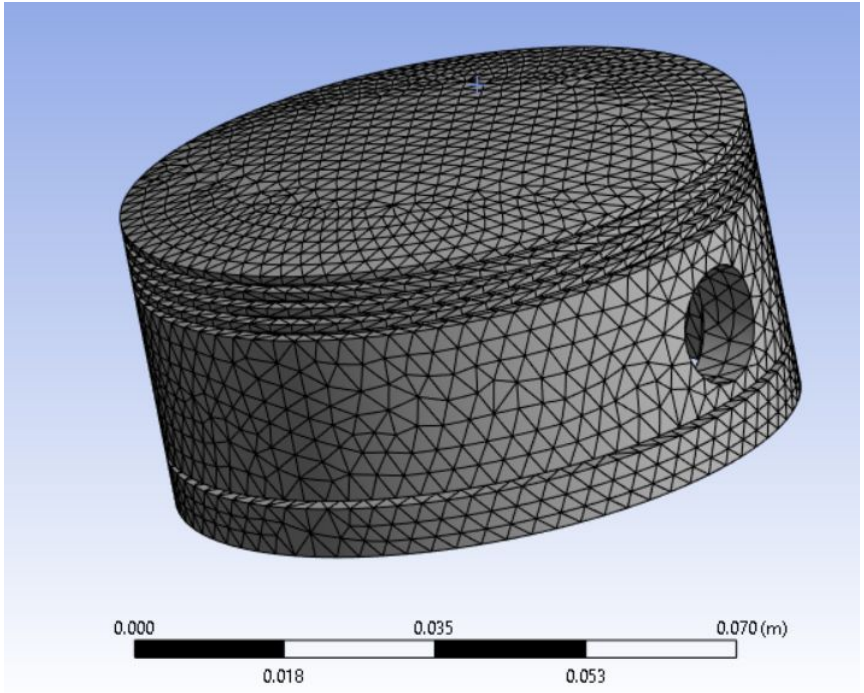
MEsh (Body Size= 3mm)



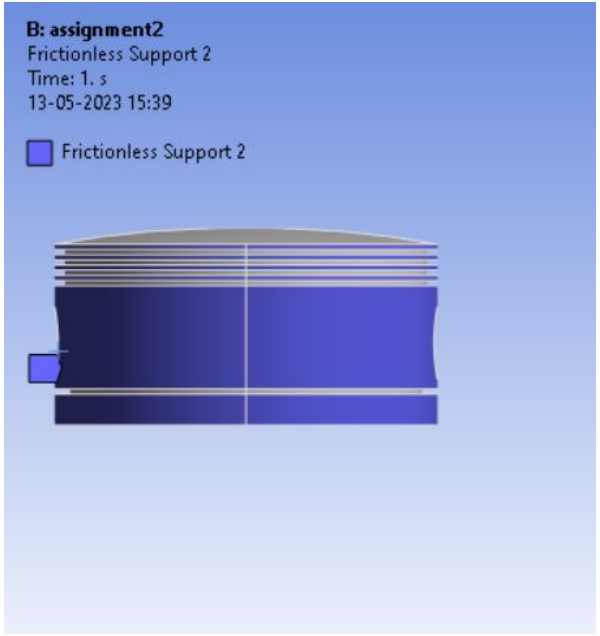
Details of "Mesh"

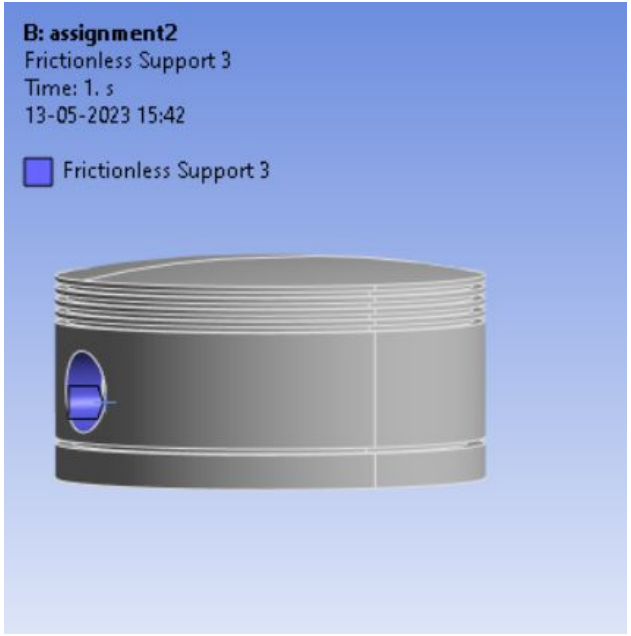
Display	
Display Style	Use Geometry Setting
Defaults	
Sizing	
Use Adaptive Sizing	Yes
Resolution	Default (2)
Mesh Defeaturing	Yes
Defeature Size	Default
Transition	Fast
Span Angle Center	Coarse
Initial Size Seed	Assembly
Bounding Box Diagonal	0.11136 m
Average Surface Area	6.9997e-004 m^2
Minimum Edge Length	1.e-003 m
Quality	
Inflation	
Advanced	
Statistics	
Nodes	37662
Elements	21974
Show Detailed Statistics	No

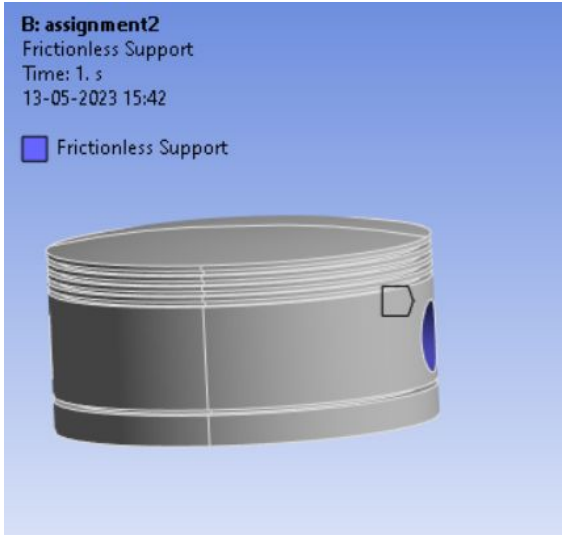




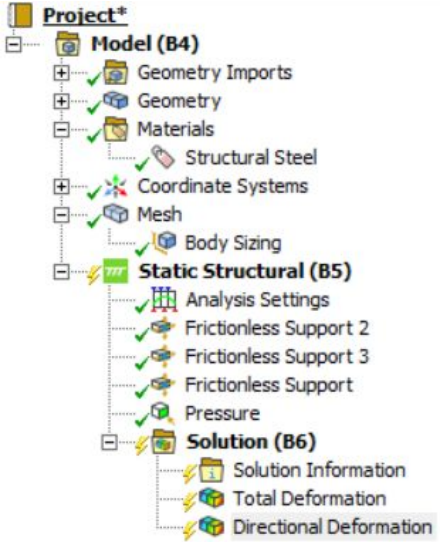
Friction support

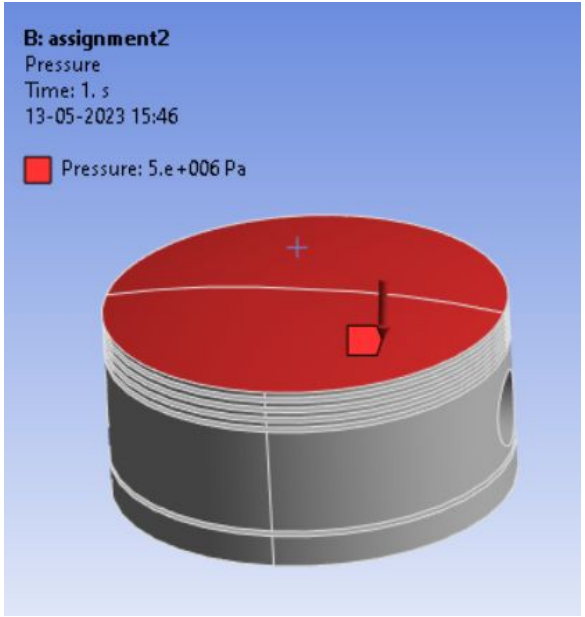




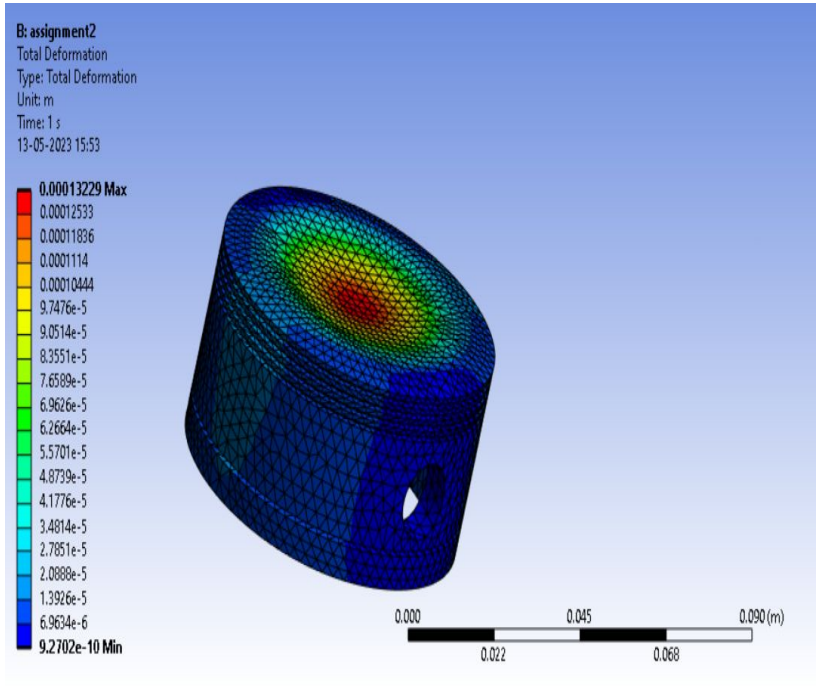


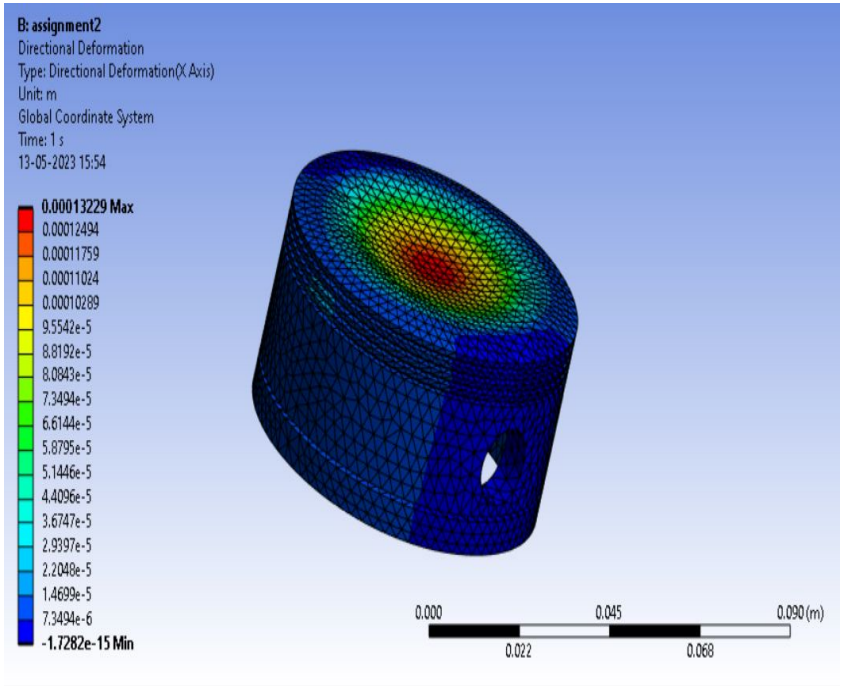
Pressure (5000000 Pa = 5Mpa)





Result


B: assignment2
Total Deformation
Type: Total Deformation
Unit: m
Time: 1 s
13-05-2023 15:53
0.00013229 Max
0.00012533
0.00011836
0.0001114
0.00010444
9.7476e-5
9.0514e-5
8.3551e-5
7.6589e-5
6.9626e-5
6.2664e-5
5.5701e-5
4.8739e-5
4.1776e-5
3.4814e-5
2.7851e-5
2.0888e-5
1.3926e-5
6.9634e-6
9.2702e-10 Min
0.000
0.045
0.090 (m)
0.022
0.068


B: assignment2
Directional Deformation
Type: Directional Deformation(X Axis)
Unit: m
Global Coordinate System
Time: 1 s
13-05-2023 15:54
0.00013229 Max
0.00012494
0.00011759
0.00011024
0.00010289
9.5542e-5
8.8192e-5
8.0843e-5
7.3494e-5
6.6144e-5
5.8795e-5
5.1446e-5
4.4096e-5
3.6747e-5
2.9397e-5
2.2048e-5
1.4699e-5
7.3494e-6
-1.7282e-15 Min
0.000
0.045
0.090 (m)
0.022
0.068