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Sem/Year: 6th/ 3rd	Roll no: 29
Date of Performance:	Date of Submission:
Examined by: Prof. B.R Pujari	Expt No:3

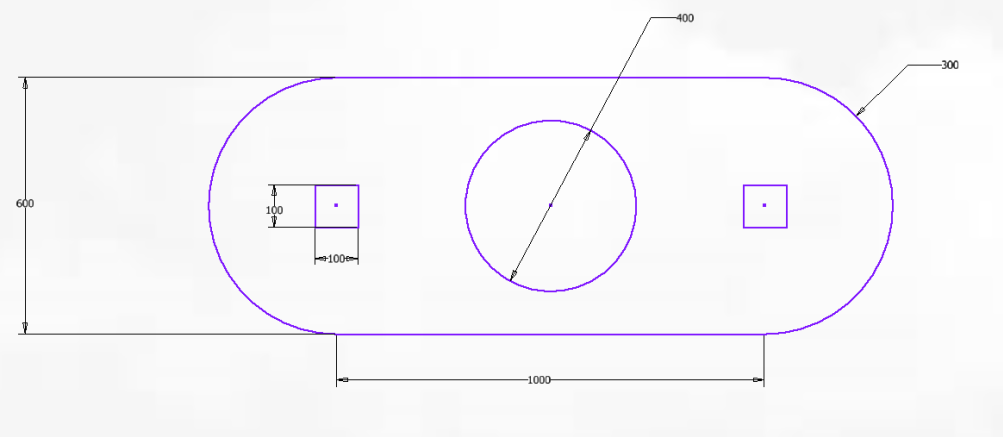
Experiment 3: Plate/Shell Element – Structural Linear and Non-Linear Analysis

Aim: To perform analysis of Plate/Shell Element

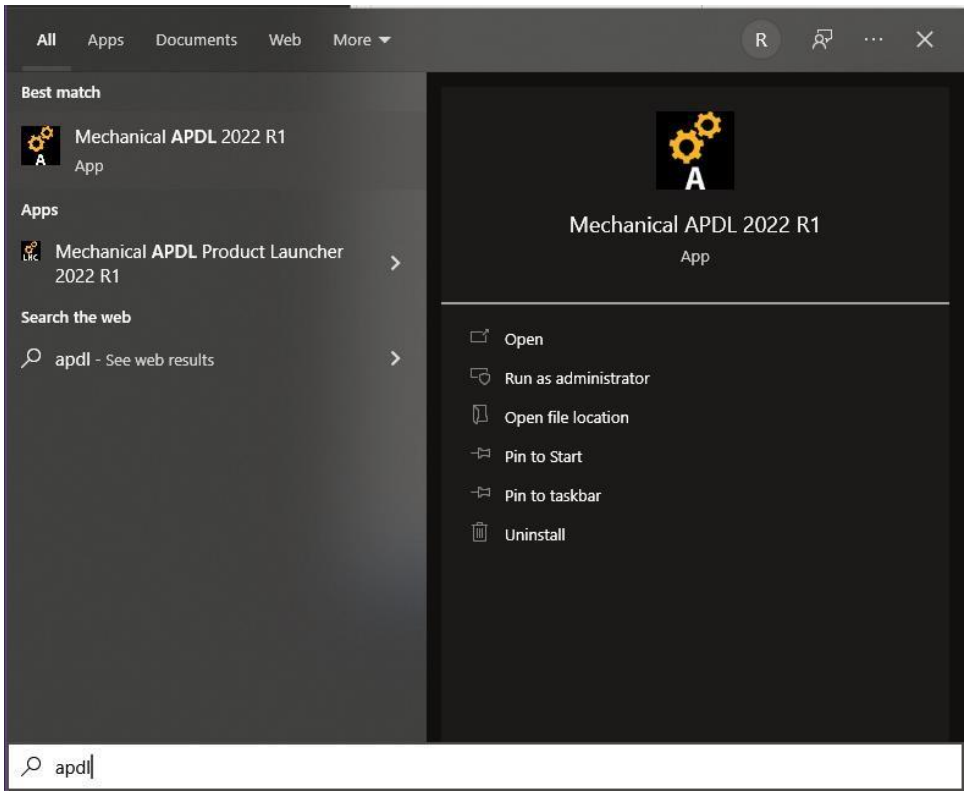
Objectives: Perform the simulation using Ansys 2022 R1

Package: Ansys 2022 R1

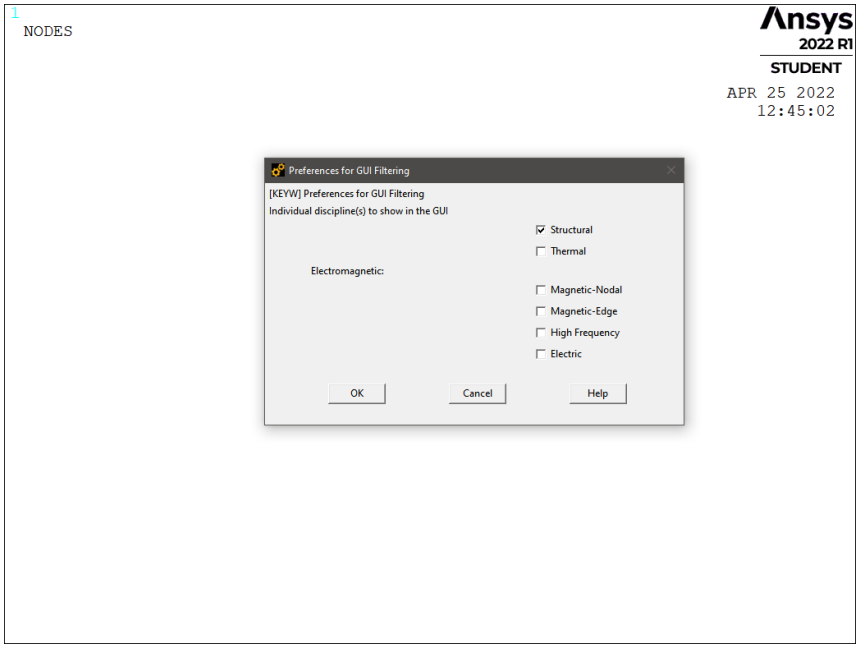
Problem:



Step 1: Run Ansys Mechanical APDL 2022 R1:



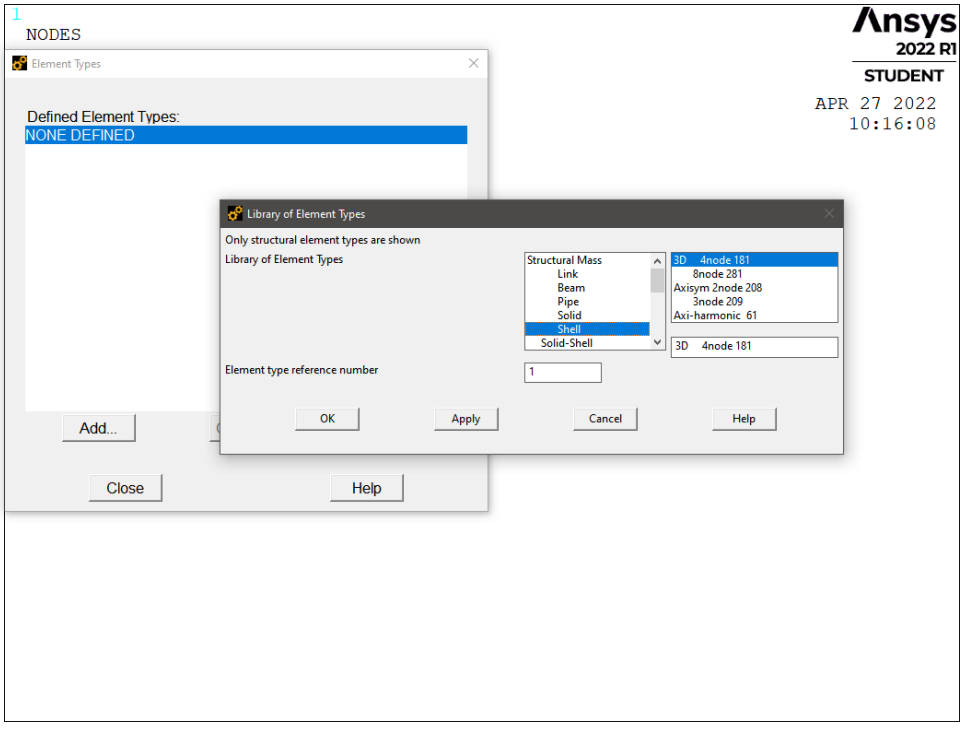
Step 2: Selecting Preference, Preferences → Structural



Preprocessor

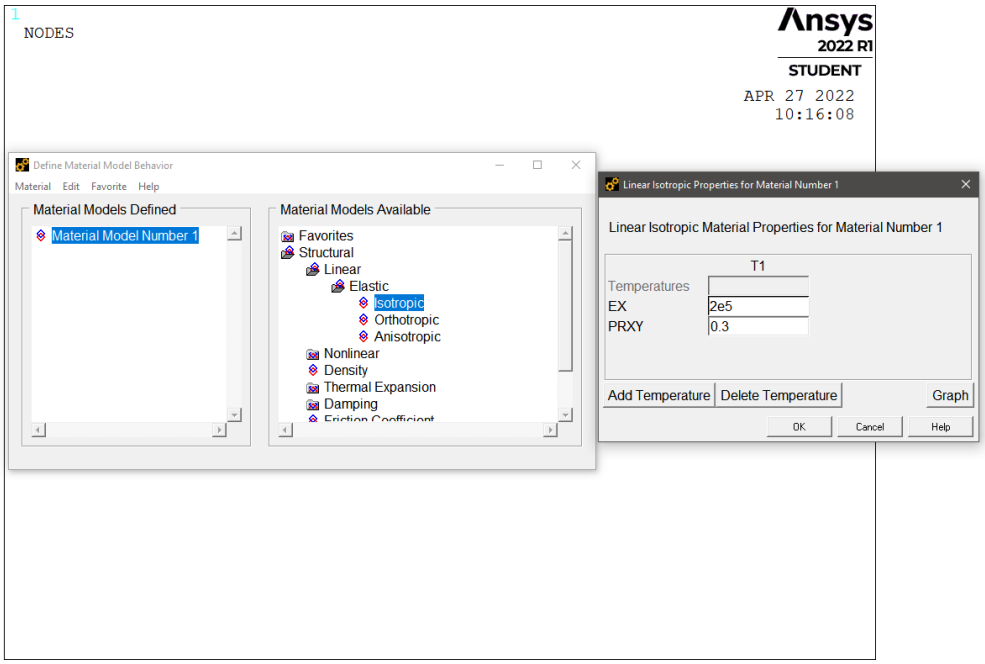
Step 3: Defining the Element Type

Pre-processor → Element Type → Add/Delete Element → Add → Shell → 3D 4 Node 181 → OK



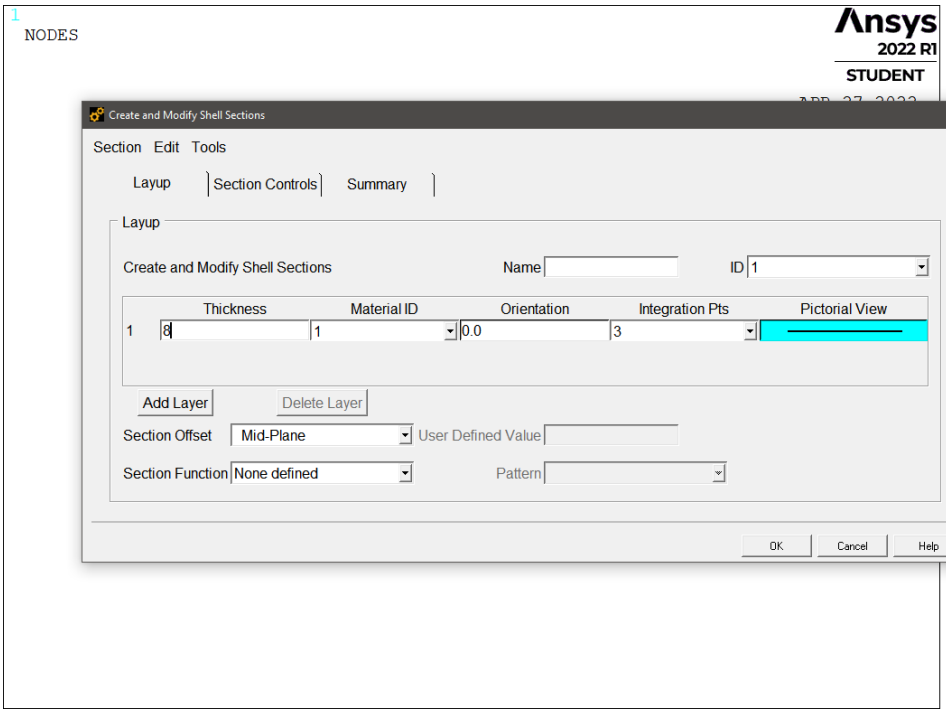
Step 4: Defining Material Properties

Material Props → Material Models → Material Models Available → Structural → Linear → Elastic → Isotropic



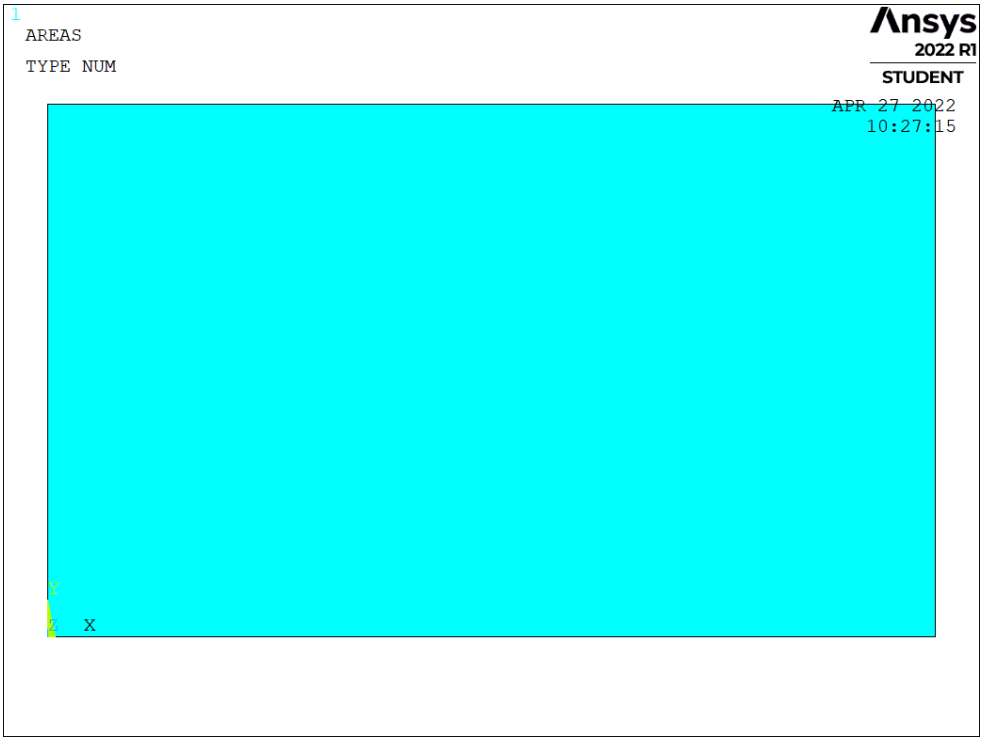
Step 5: Defining Section Of our Shell

Section → Shell → Lay up → Add/edit → Thickness → Material ID if present → OK

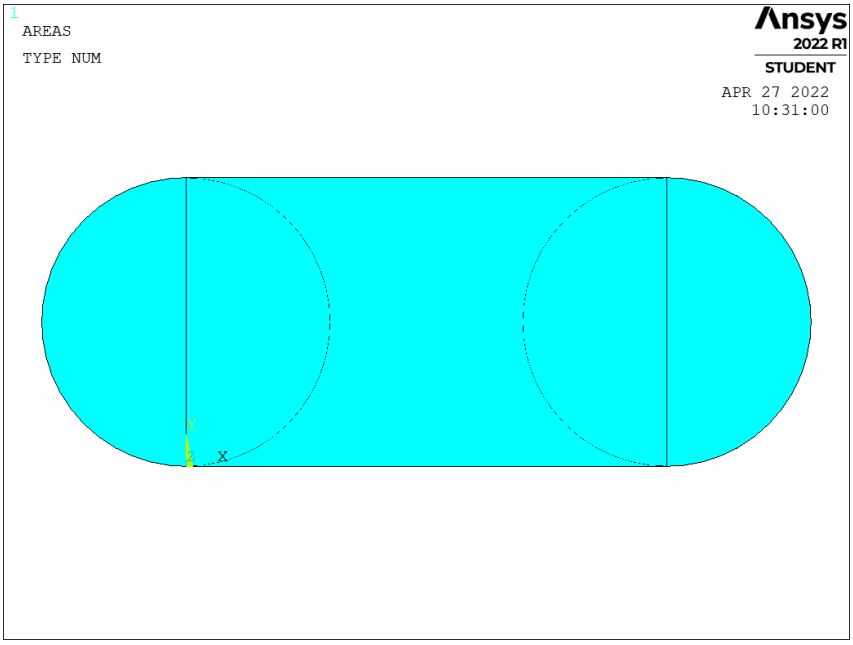


Step 6: Modelling the problem

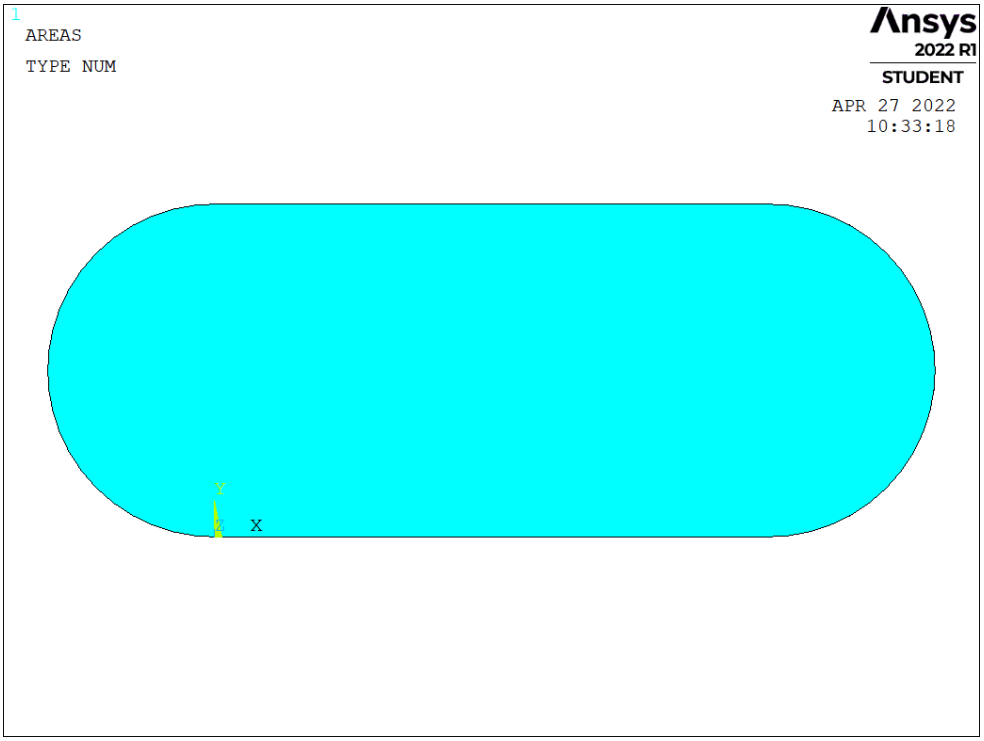
Modeling → Create → Areas → Rectangle → By Two Corners → OK → WPX, WPY, Width, Height.



Modeling→create→Areas→Circle→solid circle→ WPX, WPY, radius. Repeat this step 2 times for getting the result below.

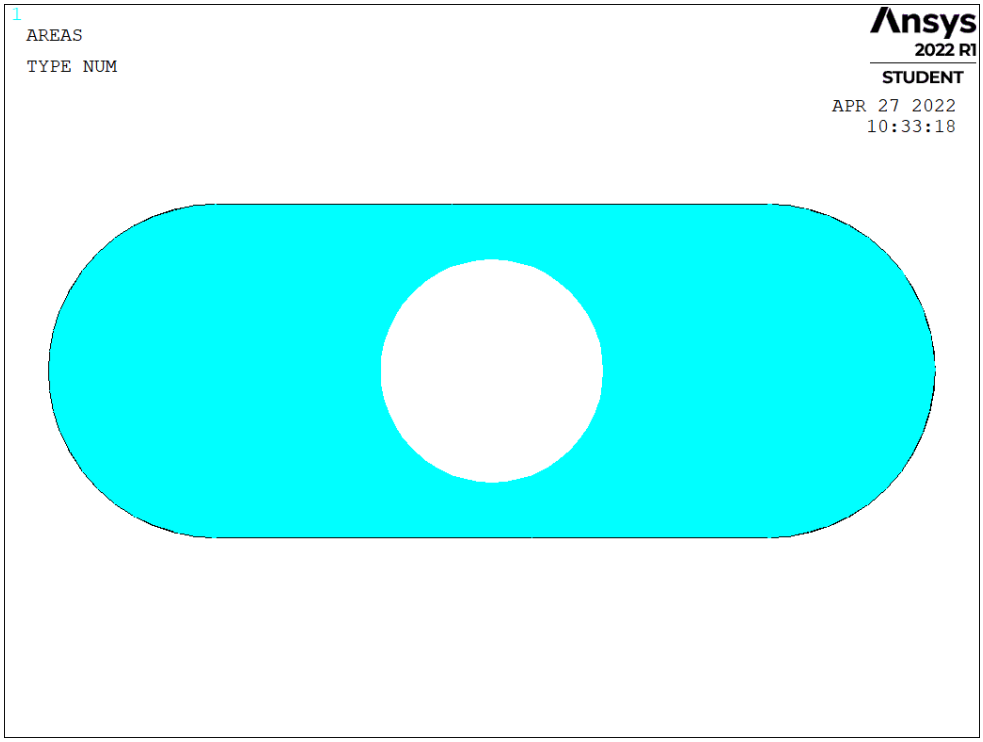


Operate : Operate → Booleans → Add → Areas → add the two new circles to the existing rectangle to make one continuous shape.

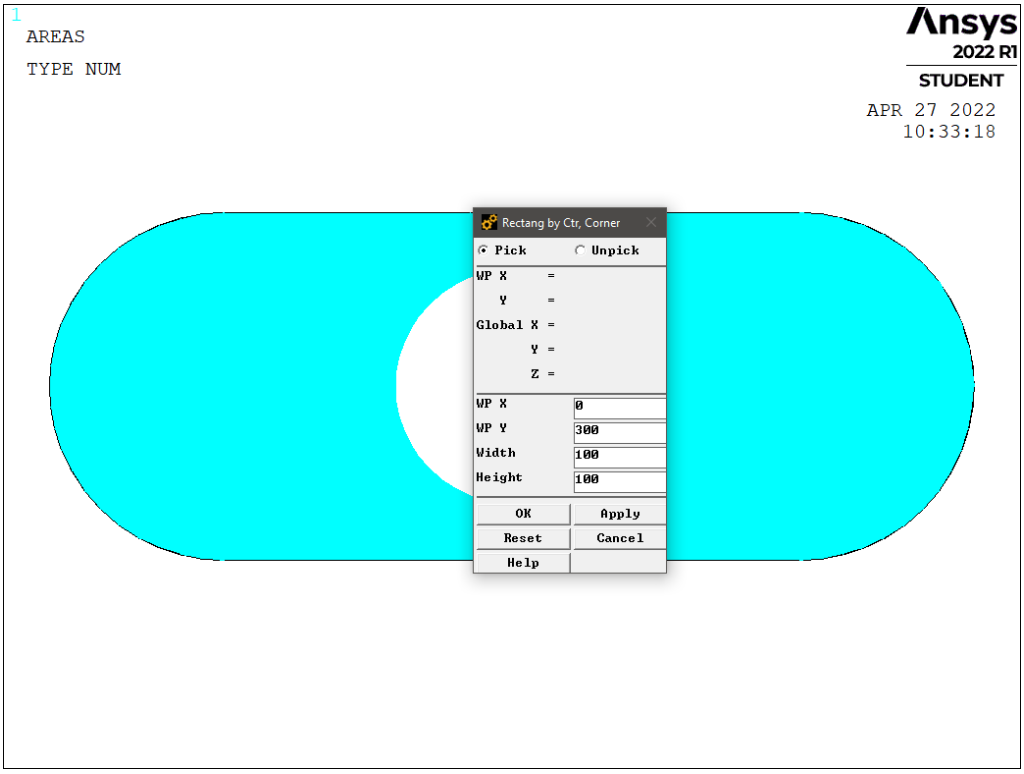


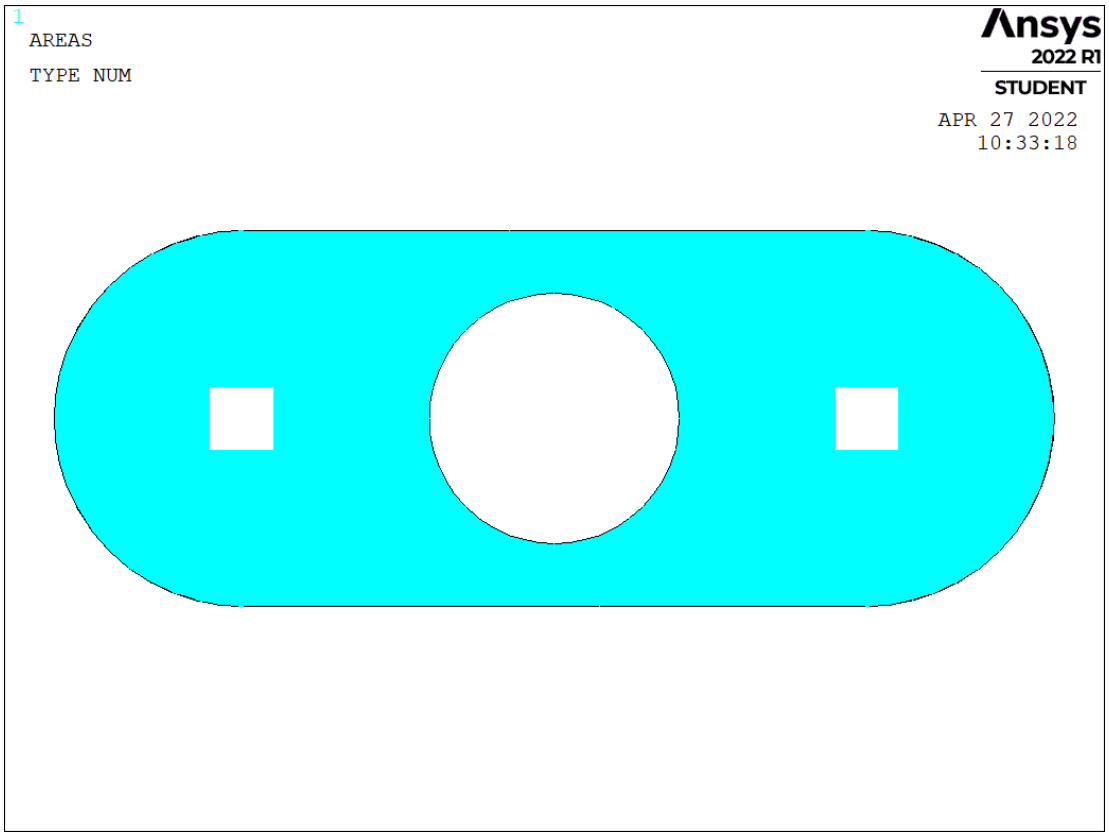
Create→Areas→Circle→solid circle→ WPX, WPY, radius

Operate → Booleans → Subtract→ Areas

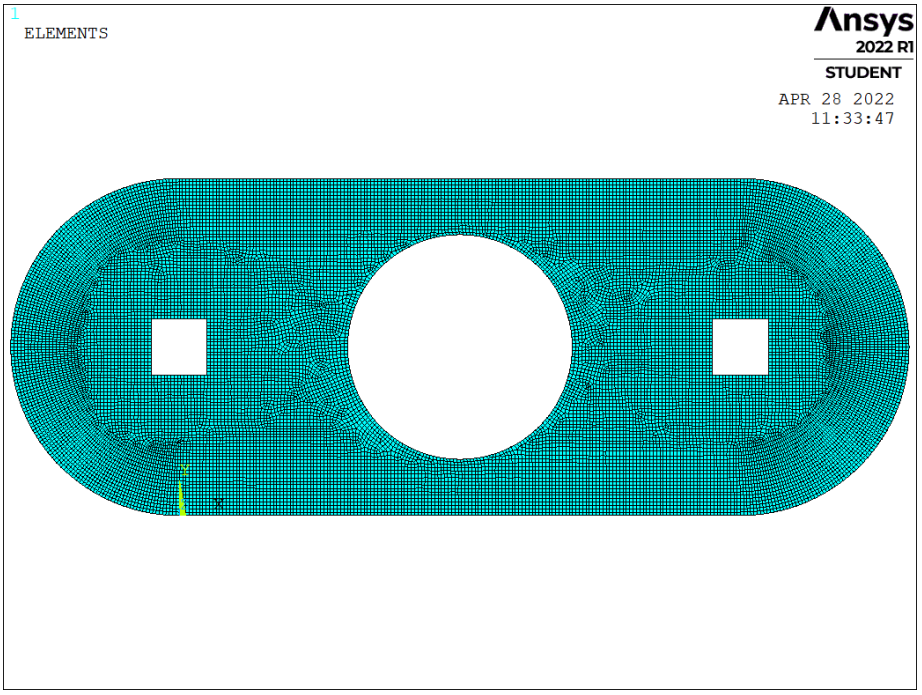


Modeling → Create → Areas → Rectangle → By Centre. And Corners → OK → WPX, WPY, Width, Height. Repeat twice, then subtract the rectangles.

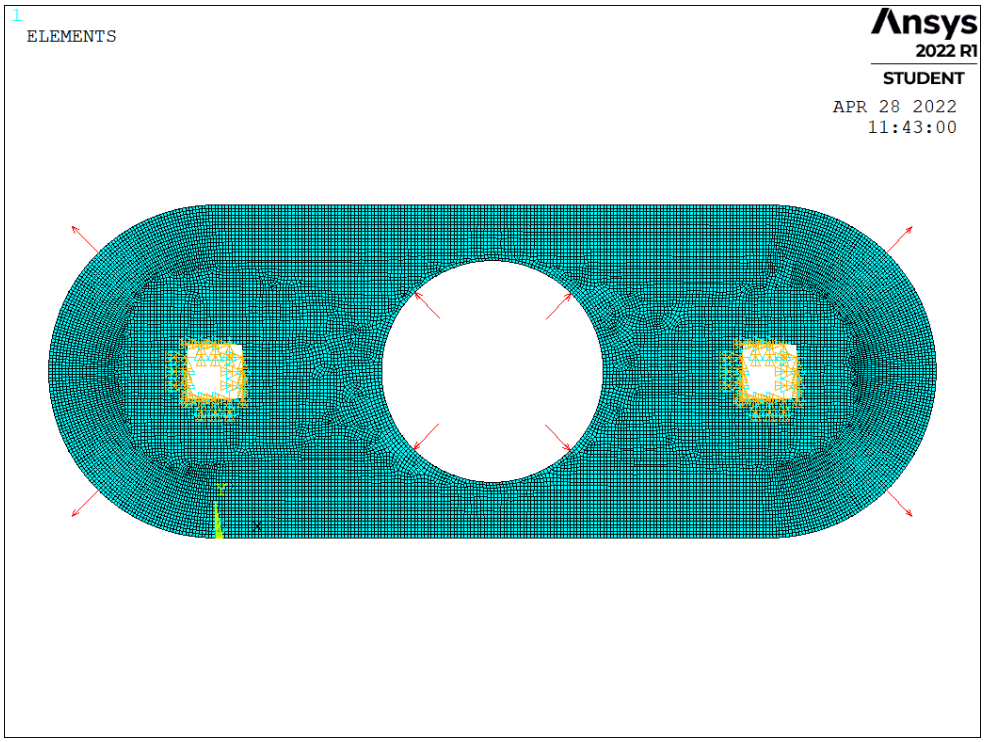




Step 7: Generating Mesh | Meshing → Mesh tool → Areas → Set → Select the shape → OK → element edge length 6 → OK →Mesh tool → Mesh → select shape → Mesh

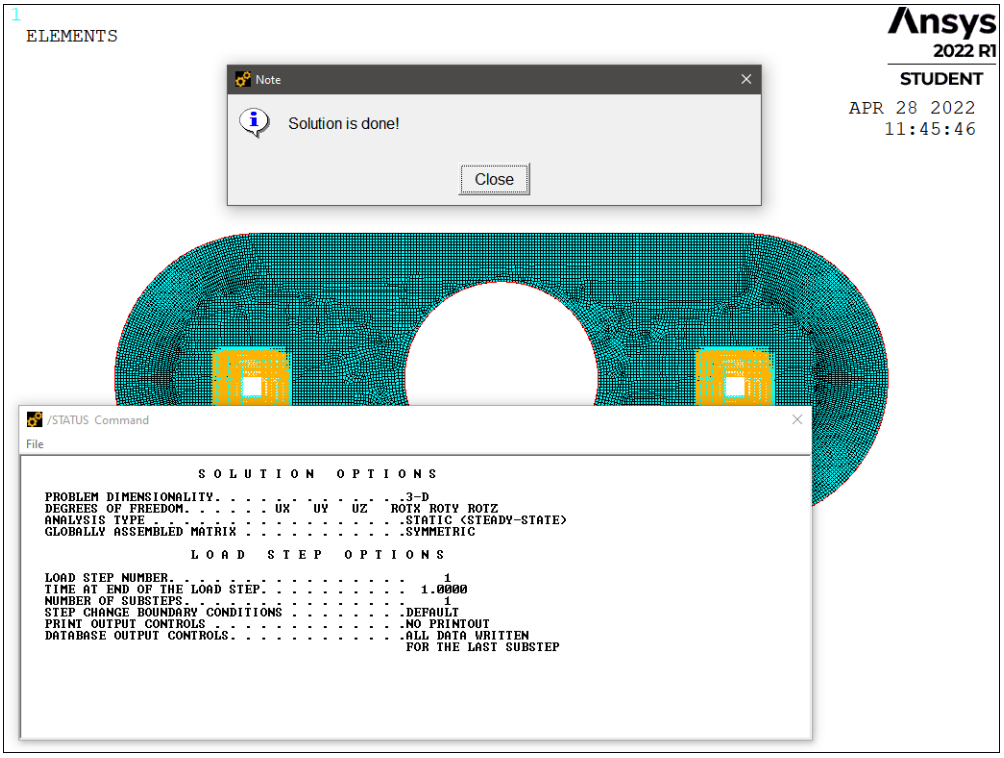


Step 8: Applying constraints and Loads | Loads → Define loads → Apply → Structural → on Line → Select the squares → **All DOF**| Loads → Define loads → Apply → Pressure → Select the end-semicircles and enter -700 | Pressure → On line →



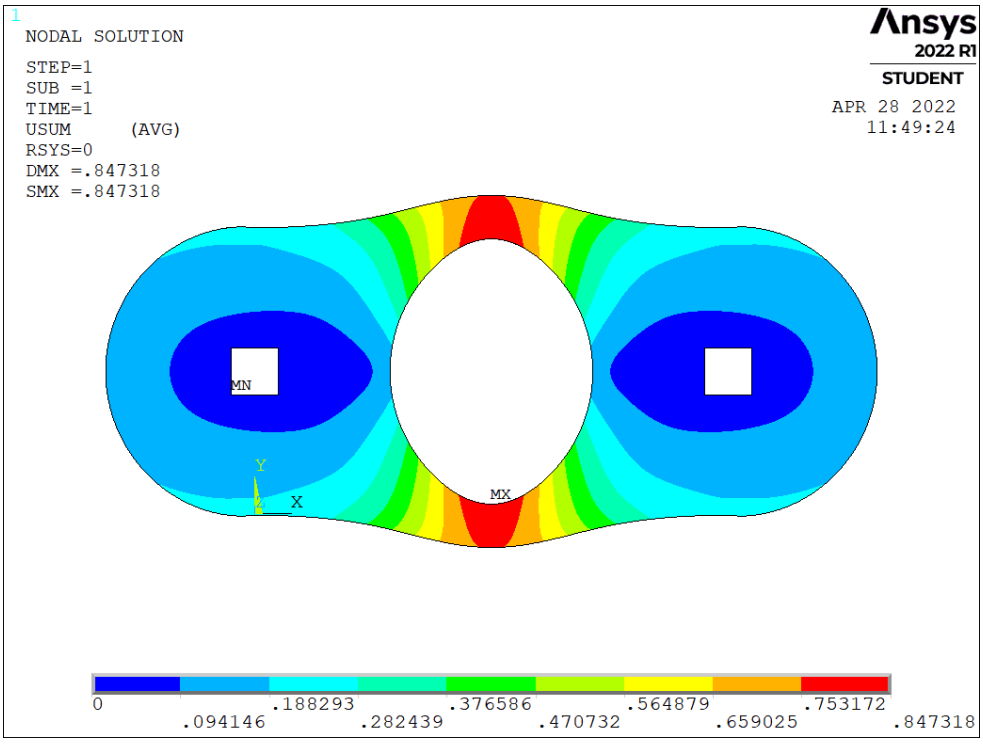
select the quadrants of the inner circle → 1500 → OK

Step 9 : <u>Solution</u> | Solution → Solve → Current LS → OK → Close



General Postproc

Step 10 : Plotting Results | General PostProc →Plot Results →Contour plot → Nodal Solution → DOF Solution → Displacement Vector Sum.



Step 11: For Stress Intensity go to General PostPro →Plot Results →Contour plot → Nodal Solution → Stress → Von Mises Stress → Apply → OK