DESIGN OF STEEL STRUCTURE

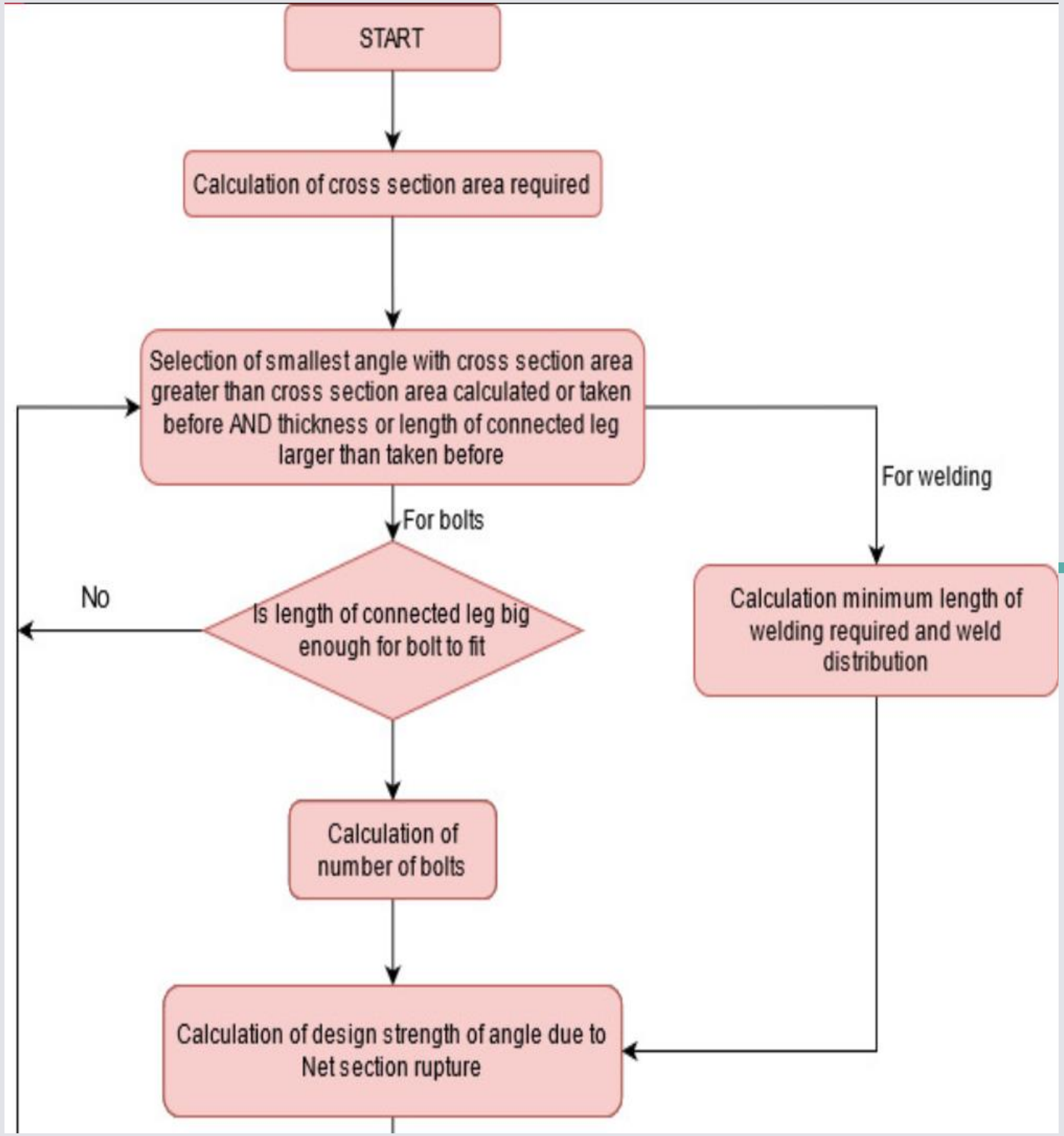
GUI PROJECT

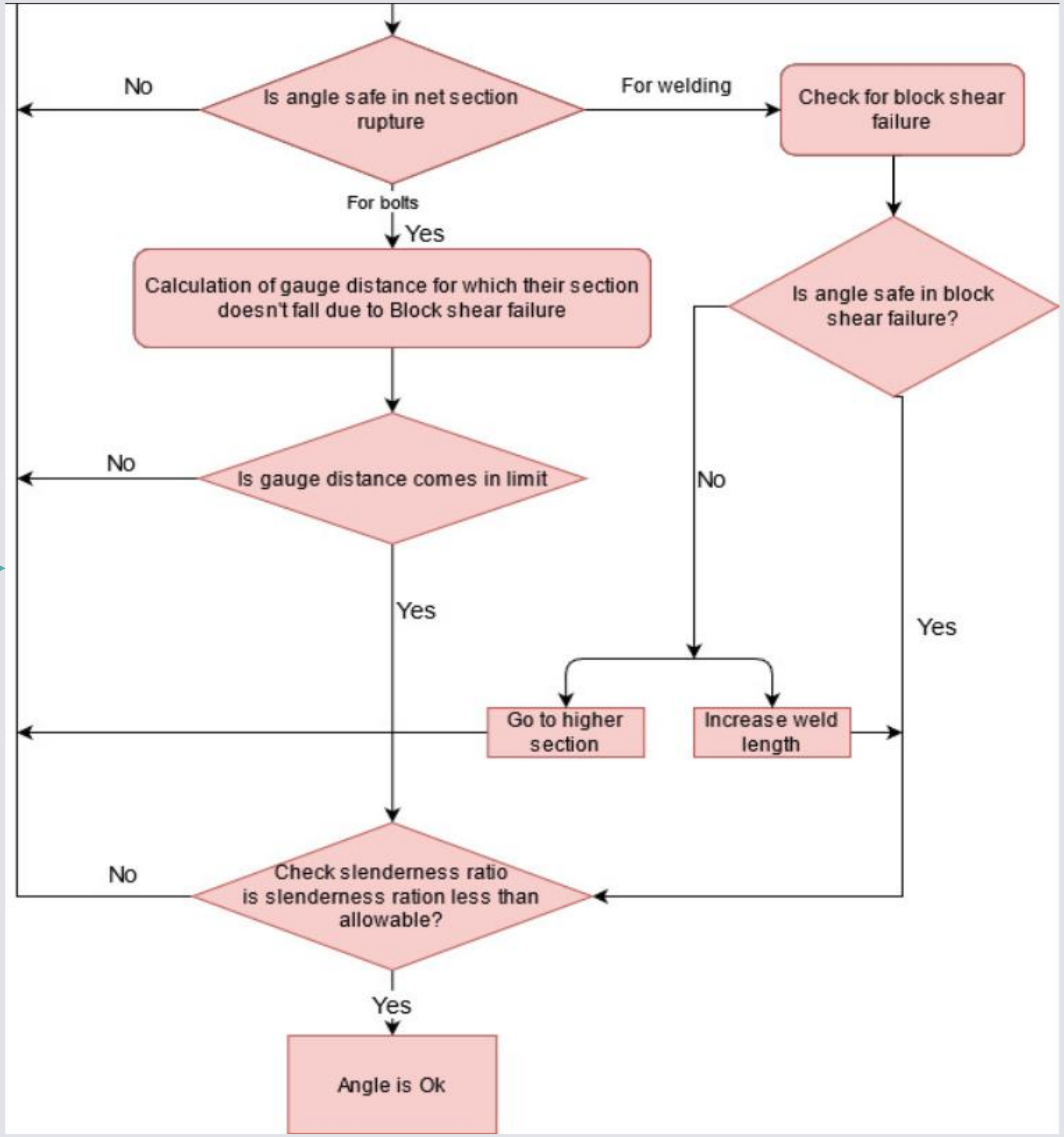
SHIKHAR MISHRA (18CE10053)

ADITI RAJ (18CE10002)

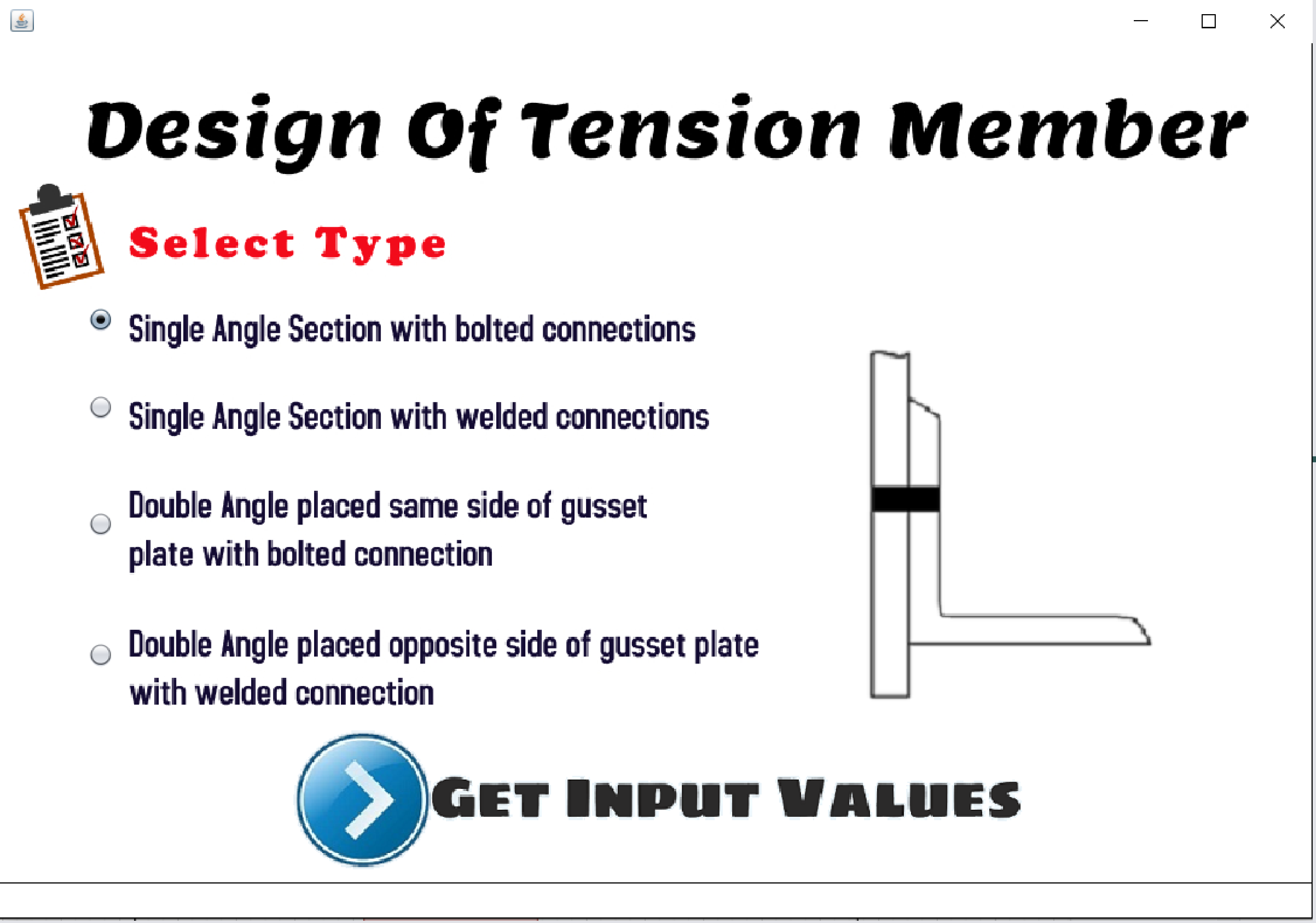
SIDDHANT SAMARTH (18CE10055)

WORKFLOW OF THE CODE



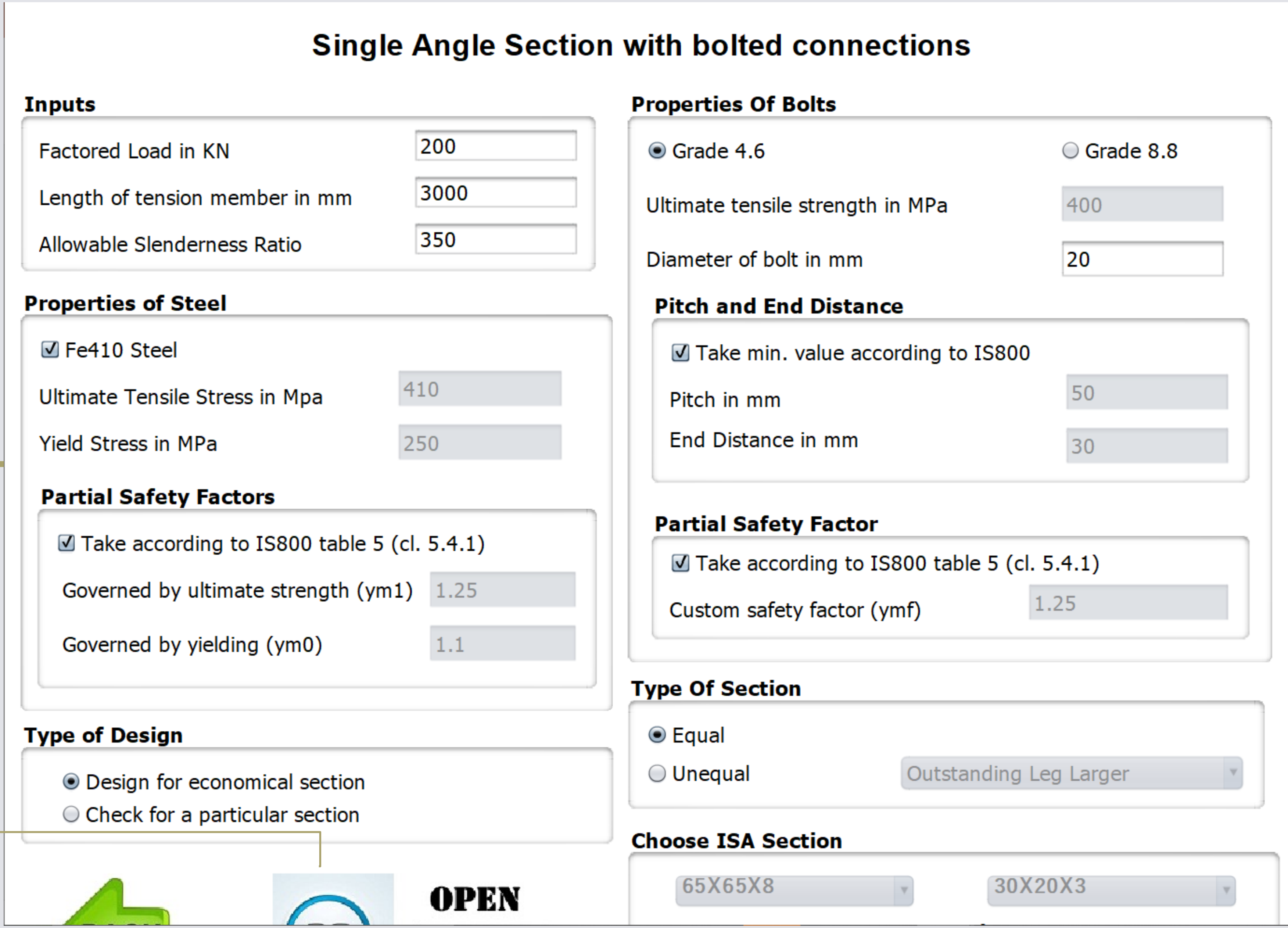


Test Case- Screen 1



SLECETING A TENSION MEMBER OUT OF THE OPTIONS GIVEN IN THE SCREEN NUMBER 1

Test Case- Screen 2



INPUT ALL THE GIVEN VALUES FOR THE TENSION MEMBER. THE PROGRAM PROMPTS THE USER TO COMPLETELY FILL THE INPUT BOXES

OPEN THE OUTPUT FILE

Test Case- Output

Single Angle Section with bolted connections

The choosen section is 65X65X8, is OK and the OPTIMUM ONE under the given load configuration

Output File

```
An = 800.0 mm^2
Tdn = alpha x An x fu/ym1
Tdn = 209.92 kN


->Block Shear Failure:
Avg = 1840.0 mm^2
Avn = 1048.0 mm^2
Atg = 288.0 mm^2
Atn = 200.0 mm^2
Tdb1 = 0.9xAvnxFu/(root(3)xym1) + AtgxFy/ym0= 244.069 kN
Tdb2 = AvgxFy/(Math.sqrt(3)xym0) + 0.9xAtnxFu/ym1 = 300.477 kN
Tdb = Min(Tdb1,Tdb2) = 244.069 kN


->Check for Slenderness Ratio:
lambda = Length of Tension Member/Rvv = 3000.0/24.7 = 121.457
As we can see,( 121.457 < 350.0 ), so OK
Hence, the choosen section, 65X65X8 is OK and the OPTIMUM ONE under the given load configuration
```

REDESIGN

GET THE RESULT OUTPUT FILE. GIVES OUT THE DIMENSION FOR THE OPTIMUM SECTION TO USE.

65X65X8 IS THE OPTIMUM ONE IN THIS CASE.

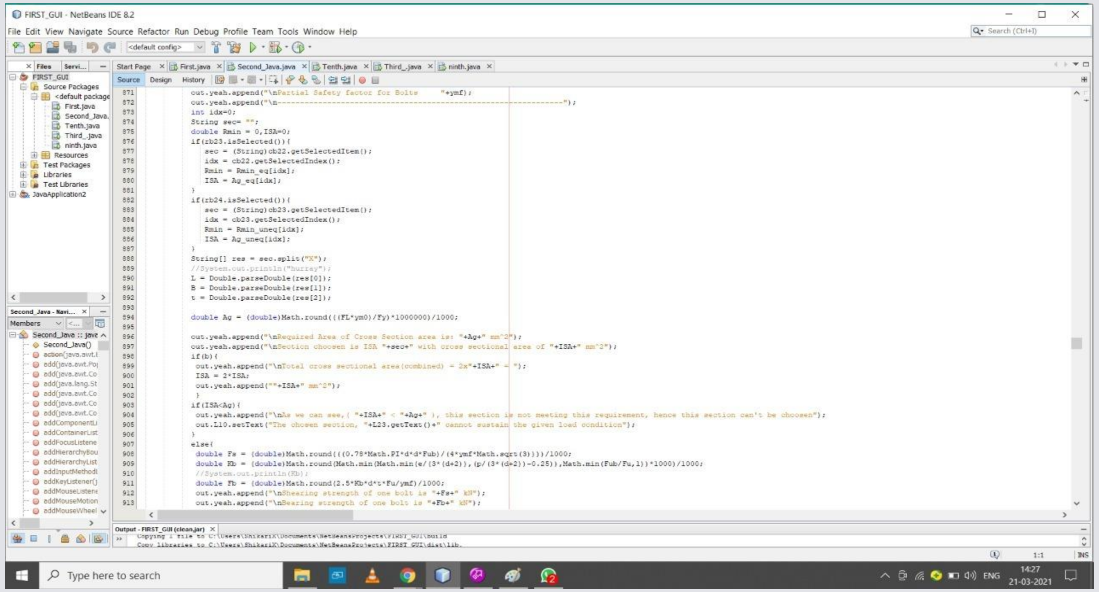
REDESIGN OR CLOSE THE SECTION AS NEEDED

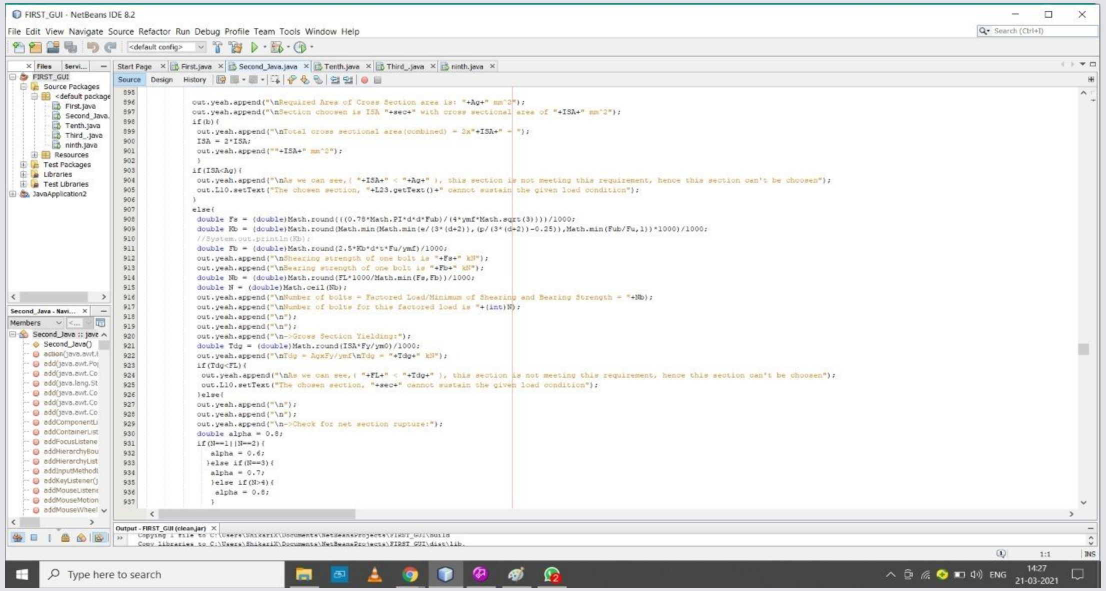
Test Case- Calculations

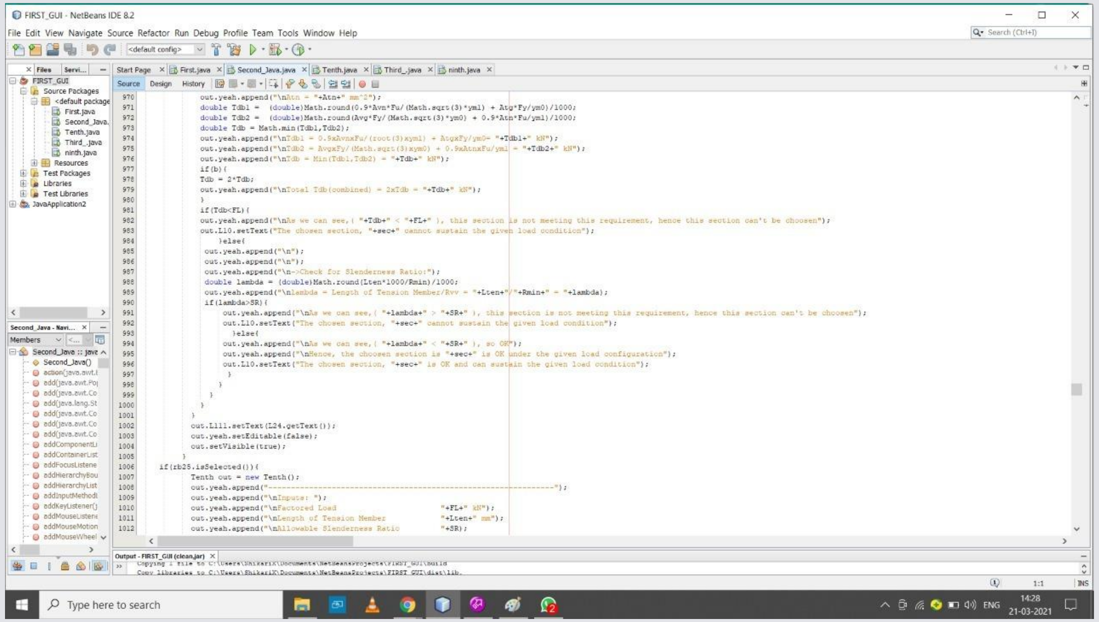
```
An = 800.0 mm^2
Tdn = alpha x An x fu/ym1
Tdn = 209.92 kN



->Block Shear Failure:
Avg = 1840.0 mm^2
Avn = 1048.0 mm^2
Atg = 288.0 mm^2
Atn = 200.0 mm^2
Tdb1 = 0.9xAvnxFu/(root(3)xym1) + AtgxFy/ym0= 244.069 kN
Tdb2 = AvgxFy/(Math.sqrt(3)xym0) + 0.9xAtnxFu/ym1 = 300.477 kN
Tdb = Min(Tdb1,Tdb2) = 244.069 kN



->Check for Slenderness Ratio:
lambda = Length of Tension Member/Rvv = 3000.0/24.7 = 121.457
As we can see,( 121.457 < 350.0 ), so OK
Hence, the choosen section, 65X65X8 is OK and the OPTIMUM ONE under the given load configuration
```

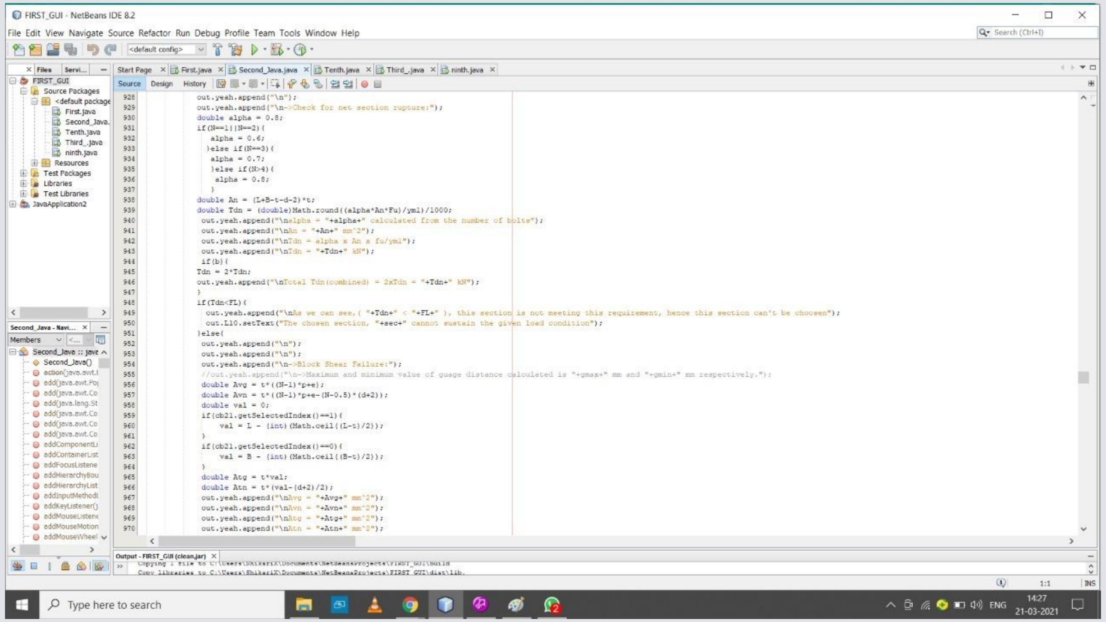
SNIPPET OF CALCULATION AS SHOWN IN THE OUTPUT FILE

Code Snippet- Written in JAVA









THANK YOU