**Special instructions:** You may work with one other student for a maximum two-person team. On submitting your homework, you should make a comment specifying your teammate. Only one teammate should submit the homework.

**Problem**

Build a graphical user interface for calculating the thermodynamic properties of steam at two different states by specifying any two properties (e.g., p&T, s&h, p&v, etc) at each state. Upon clicking the Calculate button, the program should compute all the thermodynamic properties at both states and the change in properties for a thermodynamic process leading from state 1 to state 2.

A .ui file has already been converted to a .py file for the single state thermodynamic calculator shown below and the file ThermoStateCalc\_app.py is given for a working version of the single state calculator.

Your new program should:

1. To the Specified Properties group box, add group box containers for State 1 and State 2 that allows specification of Property 1 and Property 2 for each state.
2. In the State Properties group box, you should have three labels arranged horizontally in group boxes for State 1, State 2 and State Change values reported with proper units.

NOTES:

1. We are using a module called pyXSteam, which you may install with pip install pyxsteam.
2. The thermodynamic variables are: p, T, u, h, s, v and x. You should account for all valid combinations of specifying two properties to calculate all other thermodynamic properties for each state.
3. The radio buttons for SI and English change the units for the specified properties, but you should modify the program such that if you change units, the program converts the specified thermodynamic property values to the new numerical values in the new units system. For example, if I had specified 100 C and then click on English, the temperature should be updated to 212 F.
4. We do not have to account for the solid phase or the super-critical region in this program.

Graphical user interface, text, application

Description automatically generated