

## Lab 9

### Get all data needed

Hardcode all of the data in the excel file in a list

Prompt user for Temperature

Store it in a variable

Make sure temperature is in bounds

Check if it is below the min or above the max

If it is, reprompt the user for data until it is in range

### Process User Data

Locate the range the user data falls between

Go through each value in the list until the input is greater than a value, then that value and the next are the bounds

Get an interpolation function for each range

Find the change in temperature between user data and the lowest range

Find slope between the range values

Calculate values based off of the interpolation function

Return a list containing each calculated value

### Format and output user data

Print the calculated volume to 7 decimal places

Print the internal energy to 2 decimal places

Print the calculated enthalpy to 2 decimal places

Print the calculated entropy to 4 decimal places

## Variables

tempList = list of temperatures

volumeList5 = list of volumes at 5 kPa

energyList5 = list of volumes at 5 kPa

enthalpyList5 = list of volumes at 5 kPa

entropyList5 = list of volumes at 5 kPa

volumeList10 = list of volumes at 10 kPa

energyList10 = list of internal energies at 10 kPa

enthalpyList10 = list of enthalpys at 10 kPa

entropyList10 = list of entropys at 10 kPa

userVal = users inputed temperature

outputs = a list of the four calculated values

pressure = the pressure that we are doing math with

minIndex, maxIndex = the index in tempList of the bounds used for interpolation

## Functions

interpolate(actualTemp, minIndex, maxIndex, pressure)

This function takes the inputted temperature, the indexes where you can extract data from the lists, and the pressure. It returns a list containing 4 interpolated results rounded to the right decimal point.

## Test Cases

		corner
1	-1	corner
2	280	edge
3	0	edge
4	260	edge
5	20	edge
6	40	edge
7	60	edge
8	120	typical
9	150	typical
10	75	

Describing the difficulty with which your team was able to combine the code at the end. Did this provide your team any insight into how the design itself might have been specified more clearly?

The difficulties in combining each individual person's was not the variables used, but in the coding aspect. When inputting each person's code, there was some confusion on where and how it should be placed in comparison to each group member's part. This, though, was just a minor issue. In assigning each part of the lab to each group member, it showed how a bunch of simple little goals can combine to form one large complex coding system. The lab was pretty specific to each member, with no one having much difficulty on their part of the assignment.

Describing any benefits and drawbacks you saw into dividing the coding like this. Can you see reasons why this might be a good idea? Can you see reasons why this might be a bad idea?

The main benefit from dividing the coding amongst the team member using top-down design would be the easy and clear division of work that gave each person a defined role making organization and work easier. The main downside to this approach would be the reliance on others making their code correctly as you can only check each others code when the group meets together and combines their files. So this approach would be a good idea when dealing with overly complex or difficult problems but it might be a bad idea when the group can't meet before the project can be checked or is simple.