Problem Set for 3/1/2024

Engineering 104 - Fundamentals of Engineering Computing

Formatting, Organization & Code Comments - Complete the following problems in `Python` and include as part of the submission of the appropriate assignment. Your assignment file should include a proper heading, comments and show clear organizational structure with each problem clearly printed, separated and with each result variable clearly displayed. All problems worked should have a formatted/structured print-out. Print a string denoting each problem, with the solution to the problem clearly printed as a formatted string below the denoted problem. Separate each problem using a blank line in both the code and the printed results. Code comments should be completed throughout the file on every line of code by default. If this assignment requires you to write and submit additional auxiliary script, or any other files in the submission, please append your initials capitalized to the end of the file name.

Python Lecture #19 Problems - Control Flow II (15 Points)

Problem 19.1 (5 Points) - Create a user defined function that uses control flow to define the heating status of a room. The function should take two inputs, the current temperature of the room and the desired temperature of the room. Based on the input the output should return a string `Heat` *if the measured temperature is more than 5 degrees below the desired temperature,* `Cool` *if the measured temperature is greater than 5 degrees above the desired temp or* `Off` *if the measured temperature is within 5 degrees of the desired temperature. The desired temperature is 73 degrees, call your function for measured temperatures of 60, 70 and 80 degrees. Use a print statement to report your results returned by the function.*

Problem 19.2 (5 Points) - Complete a user defined function called `circlularCalc` *that takes the numeric input of a sphere radius and string input of calculation type. The function should use conditional statements (control flow) to apply the correct calculation of volume, area (surface) or circumference as the three possible function calculation types. Report results of all three types of calculations for a radius* `r=3.5` *meters, with all reported results to rounded to two decimal places.*

Problem 19.3 (5 Points) - Define a user defined function called `myAdd` *that sums three input values and results in a printed statement of the sum of the three values. These three input values should either be ints or strings. Use the following code within your function to check for the correct input type. The code is incomplete and will need to be expanded to include all three input variables.*

```
# checks for erroneous input types

if not (isinstance(a, (int, float)) or isinstance(........):

    raise TypeError("Inputs must be numbers.")
```

Call your function, and use printed statements to report the results, to confirm that you function works both for three numerical values and raises the exception for incorrect input data types.