Homework - 1

IC100 Introduction To Programming

Question 1

Write a program to print the following phrase

"I shall be telling this with a sigh
Somewhere ages and ages hence:
Two roads diverged in a wood, and I
I took the one less traveled by,
And that has made all the difference."

Question 2

Write a program to take 2 numbers from the user and perform the following operations.

- addition (+)
- subtraction (-)
- multiplication (*)
- division (/)
- modulus (%)

Print the result of each operation as an output in separate lines.
Note: First Number Should be greater than second number.
Note: Modulus is the operation to find the signed remainder of a division of two integers. For example, 42 mod 4 = 2 and -4 mod 3 = -1
Note: Donot take zero as input for division and modulus mention this in scanf.

Input Format
Take 2 numbers using scanf.
Constraints
Take care of the cases like division by zero, adding two very large signed and

unsigned integers. Understand what happens in these and other invalid input cases by discussing them in your lab session and among team members. Finally, implement some checks to take care of these cases as necessary and print relevant errors. Understand the relative pros and cons of checking inputs and outputs in your Program

Output Format
Output for : i) addition ii) subtraction iii) multiplication iv) division v) modulus
Sample Input 0
4
3

Sample Output 1
7.000000
1.000000
12.000000
1.000000
1.000000

Question 3

Design a program to calculate the volume of a cuboid, cylinder, and sphere. Input:

- In line 1, l w h parameters for cuboid
- In line 2, r h parameters for cylinder
- In line 3, the r parameter for the sphere Output:

Print volumes of each on a separate line. (1st output for cuboid, 2nd line for cylinder, 3rd for sphere)

Input Format
Length, breadth and height of the cuboid Radius and height of cylinder Radius of sphere

Constraints
Restrict the output to 2 decimal places and take pi = 3.14

Output Format
Volume for cuboid
Volume for cylinder
Volume for sphere

Sample Input 0
3 2 5
4 6
4

Sample Output 0
30.000000
301.440002
267.946686

Question 4

Write a program to take 4 digit number as input from the user and reverse the number. Print the reversed number as output.
In the output, the line should contain the reversed number.
Note: Number Should not end with zero.

Input Format
Input: 4321

Constraints
Reverse only positive numbers.
Number Should not end with zero

Output Format
Output: 1234

Sample Input 0
1234

Sample Output 0
4321

Sample Input 1
5678

Sample Output 1
8765

Question 5

Given marks of the course for a student, follow the below grading scheme and print the corresponding grade as output. Constraints: 0 marks 100
86 - 100: A+
71 - 85: A-
56 - 70: B+
41 - 55: B-
26 - 40: C
0 - 25: F
Example:
Input:
84.25
Output:
A-

Question 6

Consider the quadratic equation ax^2 + bx + c, you are given coefficients a, b and c as inputs, find and print the roots of the quadratic equation as output. If given coefficients does not form a quadratic equation, print "Not a Quadratic Equation" as output
Input: 3 values for a, b, c in a single line separated by spaces
Output: Roots for quadratic equation
D = b^2 4ac
If D $<$ 0 output both roots separated by space
If D = 0 output single root
If D $<$ 0 print "No Real Roots" as output
Restrict output to 3 decimal places
Example:
Input:
2 5 -3
Output:
-3.000 0.500

Question 7

Given the number of sides, n of a regular polygon, calculate the interior angle. Write a check on whether the given number is valid for constructing the regular polygon, else print "Invalid Input" as output.
Example:
Input
4

Output
90

Question 8

Given the age of a person as x and the gender as 'M' or 'F'. Check whether the person is between 18 and 60 yrs. If person is between 18 and 60 then check if the person is male or female and if person is male print 'Male' other wise print 'female'. If person is not between 18 and 60 and the age is less than 18 print 'too small' otherwise print 'too big'.
Example1:
Input
45 M
Output
Male

Example2:
Input
17 M
Output
too small

Example3:
Input
65 F
Output
too big

Submission

Please submit your homework in piazza under hw1 folder and make it a private submission to the instructors. Zip all the codes and name the zip as yourname_rollno
Submission deadline is 8:00pm Nov 16.