CS1303: Introduction to Programming
Assignment 6:
Calculator-Application-2

Submission Deadline:
Monday, 21st October 2019, 10:00 PM

Problem Statement
In this assignment, you have to create a calculator application that has the following operations:

- Add
- Subtract
- Multiplication
- Division (output the **floor** of the result - e.g. floor(2.5) = 2)
- Modulo (remainder on division)
- Square
- Square Root (output the **floor** of the result)
- Log (base 2) (output the **ceil** of the result - e.g. ceil(2.4) = 3)

You can **ONLY** use **+** and **-** (add and subtract operations) to implement all of the above operations. Use of '*' (multiply), '/' (divide), '%' (modulo) and any function from "math.h" is **prohibited.** Using loops and +/-, it is possible to implement all the above functions.

All the inputs and outputs are **integers**. You can assume that **0 <= INPUTS <= 10^9** .

Please handle integer overflow subject to the above constraints if/where you think it is necessary. ***Also, you can add any error handling as you feel necessary.***

Note: You should create separate functions for each of the above operations.

Output Format

Create a menu that is displayed over and over again, until the user chooses the quit option. The menu should allow the user to choose any one of the operations or exit from the application. When the user selects an operation, you should prompt the user to input one/two numbers as required by that operation. Then print the result and display the menu again.

A sample run is shown in the screenshot:

```
MENU:
Enter the number corresponding to the operation you want to perform.
1: Add
2: Multiply
3: Divide
4: Subtract
5: Modulus
6: Square
7: Square Root
8: Log (Base : 2)
9: Exit
Your Choice: 3
Enter the first number: 5
Enter second number: 0
2nd number must be positive.

MENU:
Enter the number corresponding to the operation you want to perform.
1: Add
2: Multiply
3: Divide
4: Subtract
5: Modulus
6: Square
7: Square Root
8: Log (Base : 2)
9: Exit
Your Choice: 3
Enter the first number: 5
Enter second number: 2
The result is: 2

MENU:
Enter the number corresponding to the operation you want to perform.
1: Add
2: Multiply
3: Divide
4: Subtract
5: Modulus
6: Square
7: Square Root
8: Log (Base : 2)
9: Exit
Your Choice:
```

Submission Details:
Please submit the following information:

- **Source Code:** Your source program. The name of your file should be in this format: **Cal2-roll no.c** where you replace "roll no" with your roll number.

- **Readme.txt:** In this file, you should explain how to compile and run your program. The name of your file should be in this format: **Cal2-Readme-roll no.txt** where you replace "roll no" with your roll number.

- **Design.txt:** In this file, you explain the design of your program (control flow of your program). Your objective should be such that the TA reading this file should easily understand the working of your program. Please add details about how you have handled corner cases - i.e. for what inputs you have printed "Error". The name of your file should be in this format: **Cal2-Design-roll no.txt** where you replace "roll no" with your roll number.

Zip all these files and name it as **Cal2-roll no.zip**. **Please follow the naming convention strictly. Otherwise, your program will not be evaluated.** Then, submit it on google classroom for this assignment by the above-mentioned deadline.

Plagiarism policy: If we find a case of plagiarism in your assignment (i.e. copying of code from each other, in part or whole), you will be awarded **zero marks**. **Note** that we will not distinguish between a person who has copied, or has allowed his/her code to be copied; both will be equally awarded **zero** marks for the submission. Follow below link for more information about plagiarism policy:
https://cse.iith.ac.in/academics/plagiarism-policy.html

Evaluation Policy:
The TAs will use the following evaluation policy:
- Design: 30%
- Execution: 60%
- Indentation and Documentation (with comments): 10%

Late Submission Penalty:
For each day after the deadline, your submission will be penalized by 10 marks.