Programming Fundamentals

Assignment 3

Dated: 6-3-2020 **BS-SE'19, Morning**

Deadline: Monday, 9-3-2020, before class

Submission guidelines:

- No assignment will be accepted after due date.
- Plagiarism and copy will be dealt strictly (zero will be marked in that case).
- No second attempt will be entertained
- Write code with proper indentation and comments, without proper comments code will not be evaluated
- Read the complete statement carefully before starting the implementation
- Paste your submission (source code **.cpp**) into the following folder on \\printsrv:
  \\printsrv\Teacher Data\Natalia Chaudhry\PF \Submissions\Assignment3\
  Write access to these folders will be disabled after the submission deadline.

The source code file should have the following naming convention: RollNumber.cpp. Files will invalid name will not be evaluated.

Problem

You are required to design a calculator with following functionalities using switch statement.

1. x^y
2. Arithmetic operations (+,-,/,x,%)
3. Factorial
4. Trigonometric identities: cos, sin, tan
5. Vertical and Horizontal Histogram of a number
6. Vertical and Horizontal Double-Histogram of a number
7. Postmortem float

- Use of switch statement for implementing the logic of these 7 operations is mandatory. You can use if statements within each switch case if necessary.
- Display proper interface of calculator with appropriate messages for input
- You must NOT hardcode anything. You should take each value involved in all functions from the user.
- You must not use any built-in function to implement any of these functions, except for 4.
- For 5 and 6, you must display the histogram using loops otherwise zero will be gifted
- The program should not stop after one execution, e.g. after using function#6. It should keep on asking from the user if he wants to use the calculator again or not. Take input in character variable and check if the user entered ý' or 'n'. In case of ý', re-run the logic designed otherwise end the execution of a program. You might need to use loop to iterate repeatedly till 'n'is entered by the user.

1-4 are self-explanatory. Functionality of 5 and 6 is discussed as under.

5: Vertical and Horizontal Histogram of a number

Histogram is the graphical representation for depicting the frequency of a data. In your case, assume that the user will provide one number as an input and you have to write a logic to display the histogram of it. For example, if a user enters 10 then the resultant histograms would be:

Vertical:

```
*
*
*
*
*
*
*
*
*
*
```

Horizontal:

```
* * * * * * * * * *
```

6: Vertical and Horizontal Double-Histogram of a number

This is the same as part 5 with one change only. Instead of finding the histogram of an entered number. It first doubles the number and then display the histogram of the result. For example, if a user enters 5 then the resultant histograms would be:

Vertical:

```
*
*
*
*
*
*
*
*
*
*
```

Horizontal:

```
* * * * * * * * * *
```

7: Postmortem float

This part takes a *double/float* number as an input from the user. You must not take integer number as an input. Your task is to extract the part before and after decimal from a float number and store it in **left** and **right** variables, respectively. Display the value of these variables. You MUST NOT use typecasting or any built-in function otherwise zero will be granted.