COMPUTER SCIENCE 10A (FALL TERM, 2021)
INTRODUCTION TO PROBLEM SOLVING IN PYTHON
PROGRAMMING ASSIGNMENT 5
DUE: OCT 29

Program Description:

This assignment will test your understanding of the use of **if, else condition, for loops and parameters.** Write four scripts to solve the following problems and name each script Problem1.py, Problem2.py, etc.

You must use parameters, for example, you should prompt the user for the input in the main function and pass the input into the function that solve the problem with the user's input.

For this assignment, you must limit yourself to the Python features covered up to the first half of lecture 13 (including the Boolean logic but excluding the Strings part). Though we will cover more material while you work on this assignment, please do not use it on this assignment.

Problem 1:

Write a program that prompts the user to enter numbers, then print the smallest and largest of all numbers supplied by the user. You may assume that the user enters a valid number greater than 0 for the number of numbers to read. Here is a sample execution:

```
How many numbers do you want to enter? 4
Number 1: 5
Number 2: 11
Number 3: -2
Number 4: 3
Smallest = -2
Largest = 11
```

Problem 2:

Write a program that prompts the user to enter a positive integer value, and compute the following sequence:

- If the value is even, halve it.
- If it's odd, multiply by 3 and add 1.
- Repeat this process until the value is 1, printing out each value.
- Finally print out how many of these operations you performed.

Note: If the input value is less than 1, print a message containing the word Error and exit the program. You can assume that the input will have smaller than 200 operations. This is how the output should look like:

```
Initial value is: 9
Next value is: 28
Next value is: 14
```

```
Next value is: 7
Next value is: 22
Next value is: 11
Next value is: 34
Next value is: 17
Next value is: 52
Next value is: 26
Next value is: 13
Next value is: 40
Next value is: 20
Next value is: 10
Next value is: 5
Next value is: 16
Next value is: 8
Next value is: 4
Next value is: 2
Final value 1, number of operations performed 19
```

Problem 3:

Write a program that prompts the user for a positive integer number (not bigger than 4999) and displays it in Roman numerals.

Problem 4:

Write a program that prompts the user for two people's birthday (month and day), along with today's month and day. The program should figure out how many days remain until each user's birthday and which birthday is sooner with the results displayed on the console. Ignore leap years.

Guidelines:

You should not have any code, except a call to your `main` function, outside of a function. You should use the `main` function to call other functions that implement the solution.

Include a header comment at the beginning of your program with some basic information and a description of the program in your own words.

```
# Name Student
# COSI 10a, Fall 2021
# Programming Assignment #5
#
# Description: ...
```

You also need to include comments in your code.

Submission and Grading:

All your python scripts should be inside a folder named `yourfirstname_yourlastnamePA5`, then zip the folder into a zip file for submission. The zip file should have the following name: `yourfirstname_yourlastnamePA5.zip` (Please make sure to use exactly this file name, including identical capitalization).

Your program should be submitted via Latte before it is due (for late policy check the syllabus).

You will be graded on:

- **External Correctness:** The output of your program should match exactly what is expected. Programs that do not compile will not receive points for external correctness.
- **Internal Correctness**: Your source code should follow the stylistic guidelines shown in class. Remember to include the comment header at the beginning of your program and comment your code. You should also keep in mind of code **modularity**, utilized function, parameters and return statements to help you write efficient and modular code.