Homework 3

Dr. Manna

CS 10 | 30 points | due: 02/01/17 @ 10:00 pm

Problem statement

1. (5 points) Write a C++ program to find out the sum of the following series:

   5 + 8 + 11 + ... + 50

2. (8 points) Write a complete C++ program that reads an unspecified number of integers. Your program ends with the input 0. Determine and display how many positive and negative values have been entered, the maximum and minimum values, and the total and average of the input values (not counting the final 0).

3. (7 points) Integer division of two integers `a` and `b`, denoted `a/b`, is the whole number of times `b` divides `a`. (assume that the quotient will always be whole numbers)
   For example:

   ```
   6/3 = 2
   5/2 = 2
   4/7 = 0
   9/6 = 1
   51/9 = 5
   ```

   Write a complete C++ program to accomplish this **without** using regular division or modular arithmetic. Thus, given two integers `A` and `B`, how do we obtain the integer quotient `A/B` ?

4. (10 points) You are to write a simple program to help a painter decide how many gallons of paint to buy for a job depending on certain input data. Here's how it works:

   $$N = ((P * n_c * S) + W) * (1 + 1 / n_d)$$

   where:
   - `N` is the number of gallons of paint to purchase
   - `P` is 0.004, the International Painter's constant
   - n_c is the number of neighboring structures to be painted
   - `S` is the surface area to be painted
   - `W` is 1.2, the expected waste for any job

n_d is the expected number of days to complete the job

Important Notes:

- `N` must be an integer type since you can't buy partial gallons.
- You'll need to round up the calculation on the right-hand-side of this formula. If the result calculated for `N` above has no fractional part, add an extra gallon for safety sake.
- n_c must be an integer type since you can't have partial neighboring structure.
- `S` should be a float type since it is!
- n_d number of days needed for painting. It cannot be a fraction.

Make your prompt for input friendly and clear. The same goes for the output. You should always start with a "welcoming" message in your programs. Something like:

```
Welcome to the IPU calculator ...
```

And your prompts and output should be something like:

```
Please enter the Surface area to be painted:    _
```

Submission instructions

After you complete the assignments, please upload the corresponding .cpp files to camino under Assignment→ Homework 3→ 3.1, 3.2, 3.3, and 3.4 respectively. Please make sure you have enough comments and proper indentation (do NOT use tab, rather use double spaces).