DS1 Fa20 Homework Assignment 1

Objectives:

- Become familiar with basic Java program structure
- Become familiar with Java program elements:
  - Variable types
  - Operators and Expressions
  - Control structures
  - Input & Output statements (inc. StdIn, StdOut from the textbook)
  - Functions
- Be able to use Eclipse to create, debug and run basic Java programs.
- Be able to upload the required files to D2L.

You are to write a Java program for each of the following problems. Name your programs as: DS1hw1a, DS1hw1b, DS1hw1c, DS1hw1d corresponding to problems a-d below.

You do not need, and **may not use**, arrays, built-in sorting routines or any other Java Collections classes.
Once you have a program working, run it using the data indicated below, then copy/paste the console output into the top of your java source file in a comment block, **right below your name**. Upload the .java file to the submission folder. All output should be 'labeled' using print statements. (e.g. "the number of unique value is: ___")

A) Write a program to prompt the user for 3 integers: A, B, & C. The program should print, on separate lines:
- The number of *unique* values entered (1, 2 or 3)
- The difference between the maximum and minimum
- The quantity: avg^{Min}, (avg is the average of inputs A, B,C, Min is the minimum of A,B,C) Hint pow( )

Run this twice with the inputs shown:
(copy both output sets to source file)
1: 4 6 4 *// two unique values*
2: 6 8 9 *// three unique values*

B) Write a program to prompt the user for a positive integer: N. The program will repeatedly divide the input in half using a loop, discarding any fractional part, until it becomes 1. The program should print on separate lines:
- the sequence of 'halved' values, one per line
- the number of iterations required
- the value of $\log_2(N)$ { to do this use: log(N) / log(2) }

Run twice.
(copy both output sets to source file)
Input 1: 9
Input 2: 57

C) Write a program that will prompt the user to enter a sequence of values terminated by 0, (i.e. stop when the user enters a 0 - do not assume there will be a specific number of values). You may assume there will be at least one non-zero value entered. Print the following on separate lines:
- The average of the positive values
- The product of the negative values
- The total number of values entered (excluding the 0).

Input:
4.0
-3.7
-2.9
3.5
0

D) Write a program with two functions as described below.
Write a java function called *sum1To* with one integer parameter: N. The function will compute and return the sum of the integers from 1 to N using a summing loop. The *sum1To* function should not print anything!

The main function will input a value M from the user and then call *sum1To* M times, passing the values 1,2,3,…, M in turn. For each value V passed to the function print out:
- The value V
- The result of *sum1To*(V)
- The value of (V+1)V/2

Input: 9

27 lines of output!

Vers 1.0