CSC171 — Homework 4

Control Structures and Nesting

The goal of this assignment is to give you more practice with control structures, and especially nested control structures.

Your assignment is to write separate Java programs (separate classes, each with a `main` method) for each of the following:

1. Write a program that uses a `do-while` loop to print the squares of numbers read from the user until they enter the number 0. Do not print the final square of 0 (hint: use a nested control structure).

2. Write a program that reads an integer from the user and then prints a "times table" for the numbers from 1 to the given integer (inclusive). That is, for input n, you would print a table of n rows (lines) each with n columns, where the cell at row i and column j contains the value $i \times j$. You do need separate rows, but don't worry about the columns lining up nicely.

3. Write a program that does the following repeatedly:

   - Asks the user for three numbers.

   - If all three numbers are 0, the program should finish.

   - Otherwise, print the numbers from the first number to the second incrementing by the third.

   - Repeat.

4. The *alternating harmonic series* is the following:

$$\frac{1}{1} - \frac{1}{2} + \frac{1}{3} - \frac{1}{4} + \frac{1}{5} - \frac{1}{6} \cdots$$

Write a program that asks the user for a number n and then calculates and prints the sum of the first n terms of the sequence. Try your program with n equal to 10, 100, and 1000. Compare to the value of `Math.log(2)`. Hints: You'll need to use a `double` for the sum, and be sure you don't use integer division for the individual terms. You'll also need to switch between addition and subtraction. I can think of two ways (one using a variable that changes value and one using a conditional).

Grading Scheme

Equal weight for each part.

Doesn't compile or is trivial	$< 50\%$
Compiles and is non-trivial	$\geq 50\%$
Complete and correct with good style and comments	100%
Incomplete, incorrect, bad style, no comments	$< 100\%$

Submission Requirements

Your submission **MUST** include a file named "`README.txt`" with your name, your NetID, the assignment number, and your lab section. This file should explain anything we need to know about how to build and run your project. In particular, be sure to explain how to run what parts of your submission for each question in the assignment.

Submit your solution as a single ZIP archive to BlackBoard before the deadline.

Late homeworks will not be graded and will receive a grade of 0.

All assignments and activities associated with this course must be performed in accordance with the University of Rochester's Academic Honesty Policy.