CS100M Spring 2004 Assignment 4: A New Language

Due Friday, April 1, 23:59, but will accept penalty-free until Monday, April 5, noon

0. Introduction

0.1 Goals

This assignment will help you develop skills in using Java tokens and statements. You will be focusing on Java's syntax and semantics rather than problem solving.

0.2 Instructions

Be sure to read the *entire* assignment before answering the questions! Do the tasks in the following sections. You may work with one partner or by yourself for this assignment.

0.3 Submission

Follow the **Submission Format Requirements** at the <u>CMS Info</u> link on the course website. The last section describes what to submit on CMS.

0.4 Grading

All code that you submit must run without warnings and errors. Otherwise, you will receive a zero. This assignment's weight counts as a typical assignment. People who submit their final copy by the deadline on Friday will get 10 bonus points.

0.5 Academic Integrity

You must abide by the Code of Academic Integrity, which is provided for CS100M, the Department of Computer Science, and Cornell University on our course website. Refer to the link called <u>Academic Integrity</u>. Problem 1, below, relaxes some of these rules, as explained in the problem.

1. Numerical Analysis

Refer to the posted, partially complete solution **Problem1.java**. When complete, this program performs the same analysis for pile depth with the LHSRHS and bisection algorithms as in Assignment 3. We have changed the user interface a bit, but the primary algorithms are the same. You need to fill in the bodies methods that are indicated in the file: **lhsrhs**, **bisection**, and **evalPileDepthEqn**. You may write additional methods, though you are not required to do so. You may not change any of the other methods that we have supplied. When developing your work, you need to place **SavitchIn.java** in the same directory so that you can process input. Submit the entire program, including your changes. You may use our posted A3 solution for your development. You also use any code that you developed on A3, even if you worked with a partner.

To help you with your development, here is a sample session:

```
> java Problem1
Welcome to Problem 1 of A4!
Which technique do you want? [(L)HSRHS,(B)isection,(Q)uit]: L
Now using LHSRHS!
Enter your initial guess for pile depth: 3
```

```
Enter your initial direction for iteration [-1,1]: -1
LHSRHS: 3.4218299999999733
EQN: 5.426759497999534E-4
Which technique do you want? [(L)HSRHS,(B)isection,(Q)uit]: L
Now using LHSRHS!
Enter your initial guess for pile depth: 3
Enter your initial direction for iteration [-1,1]: 1
LHSRHS: 3.421829999999933
EQN: 5.426759518747382E-4
Which technique do you want? [(L)HSRHS,(B)isection,(Q)uit]: B
Now using Bisection!
Enter your initial guess for the left depth: 0
Make it positive!
Enter your initial guess for the left depth: 1
Enter your initial guess for the right depth: 5
BISECTION: 3.4218292236328125
EON: 4.6228670801218286E-4
Which technique do you want? [(L)HSRHS,(B)isection,(Q)uit]: A
What?
Which technique do you want? [(L)HSRHS,(B)isection,(Q)uit]: q
Good-bye!
```

2. Number Guessing

Refer to the <u>number guessing example</u> in lecture (<u>http://www.cs.cornell.edu/courses/</u> <u>cs100m/2004sp/Lectures/Repetition/ng.txt</u>). Write a Java program called **Problem2.java** that has the same functionality without the music.

For processing input and a system to repeat the program, refer to the supplied code inside **Problem1.java**. To generate a random number, use the following method:

```
public static int randInt(int low, int high) {
   return (int) (Math.random()*(high-low+1)) + (int) low;
}
```

You will be responsible for understanding how to generate random numbers in Java throughout the rest of the semester, so be sure to trace and test **randInt** thoroughly.

3. Submitting Your Work

Submit a zip file called **a4.zip** that contains these files:

- Problem1.java
- Problem2.java

Do not submit any other files! As a reminder (see first page), refer to **Submission Format Requirements** on <u>CMS Info</u> on the course website before submitting any work! You will find some differences for Java programs.