

SE/CS 2S03: Principles of Programming

Due on October 18th

Dr. Jacques Carette

Idea

The goals of this assignment are:

1. get some practice with Java
2. deepen understanding of `if` construct
3. deepen understanding of `for` loops
4. use basic TDD.

The Task

Grab `a1.zip`. It contains 4 files: `A1Test.java`, `A2Test.java`, `se2s03/A1.java`, and `se2s03/A2.java`. The first two are JUnit test files, while the next two are template solutions.

The body of the function `cases` in class `A1` should consist solely of (nested) `ifs` where the condition will look like `var <= integer` (with `var` one of `v,u,w`). The body of the innermost `if` (and `else`) will look like `return integer`. There are 3 variables, so 8 cases in total. In the usual layout, the model solution has 25 lines of code (of just conditionals, returning a single integer, or closing brace).

In `se2s03/A2.java`, the problem is that the initialization of the variables is incorrect. The code itself does not need to be changed, just the initial values of the variables.

Submission Requirements

- Correct versions of `A1.java` and `A2.java`.

Bonus

All of the following will be worth a few extra marks. Make sure you document that you have done these.

- For `A1`, **additionally** submit an alternate version which encodes the same function but as a single mathematical function rather than using `if`.
- For `A2`, **additionally** submit an alternate version which computes the answer directly as a mathematical function (no loop or recursion, but powering is needed).

For 20 extra marks (i.e. 20% of your final course mark), write an *assignment 1 generator*: the input would be a text file with student ids, and the output would be one directory per id, with each directory containing:

- `se2s03/A1.java` and `se2s03/A2.java` which are like the solutions for assignment 1, but have been randomized; for `A1`, the breakpoints and values should be, for `A2` the initial values.

- `A1Test.java` and `A2Test.java` which contain enough correct tests for the above 2 files for them to be used for TDD, as for this assignment.

If you choose to write this generator in Scala or Haskell (and it is correct), you may earn up to 10 extra marks.