EECS 4313 Assignment 3
- White-box Testing with JUnit
Due: Noon, March 16, 2016

1. Assignment goals

The purpose of this assignment is to give you experience applying path testing approaches and measuring coverage. Your task will be to create a test suite in JUnit, produce bug reports (if any), and submit a written report describing your testing.

2. Getting started

1. For this assignment, you should continue with **the same** open source system that you have used in Assignment 2. You can refer to the Appendix B of the Assignment 2 descriptions if you have not successfully managed to import the project source code into Eclipse.
2. Install the **EclEmma** plugin for Eclipse from the Eclipse Marketplace (Help -> Eclipse Marketplace). Measure coverage for the test cases you created for Assignment 2. Make note of the coverage measurements as you will need them for your report.
3. Based on the coverage results, add more test cases to your test suite to bring the code coverage of your selected methods as close as possible to 100%.
4. Derive the Control Flow Graph for one of the methods you have tested. Calculate the number of paths in the method (use Boundary Value Analysis in the case of loops). Estimate the percentage of paths that your test suite covers. What other test cases that would not improve statement coverage would you like to add based on this? Implement as many test cases as you can.
5. If you believe that the additional test cases have revealed new bugs, attach bug reports in the written report (see section below for details).

6. Written Report

For this assignment, you should create a written report (a3.pdf). The report must include the following information:

- The statement coverage measurements for your Assignment 2 test suite.
- A description of the test cases that you added in this assignment to improve statement coverage. The marker will not read your code in order to see what you tested. You have to describe it.
- The statement coverage measurements for your final submission. If your coverage is not 100%, include a discussion on why that is.
- The Control Flow Graph you created. Indicate the segments clearly (you will probably need to include the code for this).
- The path coverage discussion described in section 2 above.
- Attaching bug reports if bugs are discovered using your testing methods. You should use the same bug report format as in Assignment 1. **Do not** file these bug reports to the project's bug report system.
- An appendix with the specification of the methods you are testing (copied from Assignment 2).

Presenting your thought processes in English is an important skill for a software engineer. If you have trouble in writing English, ask someone to proof-read and correct your writing. You can also consult the English as a Second Language Open Learning Centre (http://www.yorku.ca/eslolc) at the York University.

3. Submission

You can work with **at least one and at most two** partners (a team thus has a maximum of 3 members). Submit a PDF of your report (a3.pdf) and the test code package (i.e., eecs4313a3) electronically. Your report must include the names and the student numbers of all the team members. **Only 1 submission per group, please!** You should also bring a hardcopy of the written report before the class.

Navigate to the directory where it contains the code package and the report. Use the following commands to submit:

- submit 4313 a3 eecs4313a3
- submit 4313 a3 a3.pdf