CS 4501/6501: Assignment 10
Due 30-Nov-2017

Purpose: Experience with existing tools, apply software testing concepts in practice

There are six options for the final assignment. Choose **one** option. For those with an interest in mutation testing, the last two provide great experience in addition to *muJava*.

1. For those with interest in Agile methods do something that you haven't done before. For novices, this might mean working through a simple TDD example such as Koskela-chapter 2 (free trial available). Please refer to class meeting 09/14.

2. For more advanced Agile developers, this might mean setting up and playing with a continuous integration service such as *Jenkins* or *Travis CI*. Or it might mean delving into mocking tools such as *EasyMock* (what Koskela uses), *JMock*, and *Mockito* (popular) at more depth than you currently have.

3. Download the *Pex* tool and use it to generate some tests on a small project.

4. Read the book *How Google Tests Software* and determine where you (or your organization/company) is on the *Test Certified Level*. Create a plausible plan to move you (or your organization/company) up to a higher level. [Ideally, you would want to actually start implementing this plan, but that is not required for credit.]

5. Consider the *PIT* mutation tool. Apply PIT to a program of your choosing and generate tests to kill the PIT mutants. Analyze the PIT mutation operators and determine whether or not PIT mutation subsumes branch (edge) coverage (with either the default or the optional operators).

6. Consider the *Major* mutation tool. Apply Major to a program of your choosing and generate tests to kill the Major mutants. Determine how many of the unkilled Major mutants are equivalent. (If you have more than a handful of these, you should use a statistical approach that involves only analyzing enough to answer the question to a reasonable confidence level - say, 90%.)

In all cases, write a report describing

- What you have done
- What you have learned
- How your finding(s) can be applied to your life or in practice
- Include necessary images (or screenshots), figures, tables, tests and snippets of code to support your discussion

Be sure to specify which option you do

You report should tell a story showing that you have completed this assignment.

I will grade this assignment on how well your report is expressed and how well your points are supported. I will not explicitly grade the grammar and syntax, although you should try your best and edit carefully. If I cannot understand a sentence, I will just have to ignore it.

The report should be short and to the point. Although I will not put a length limit on it, a report that has 1-3 pages is about right. A report that has more that 3 pages is probably too long and has unnecessary information. If you try to discuss everything in 1 paragraph, I will either be very very impressed by how concise you are, or disappointed in how little is said.

Please make your report direct, to the point, and always justify your assessment.

This assignment is supposed to help you explore how software testing has been or can be applied in practice.

[Total: 20 points]

Criteria	score = 5 pts.	score = 4 pts.	score = 3 pts.	score = 2 pts.
Organization	Report shows high degree of attention to logic and reasoning of points. Unity clearly leads the reader to conclusion and stirs thought regarding the topic.	Report is coherent and logically organized with transitions used between ideas and paragraphs to create coherence. Overall unity of ideas is present.	Report shows some coherent and logically organized. Some points remain misplaced and stray from the topic. Transitions evident but not used throughout the report.	Report lacks logical organization. Generally unclear. Ideas lack unity, transitions abrupt or confusing, context unclear.
Development	Main points are well developed with high quality and quantity support. Reveals high degree of critical thinking	Main points are well developed with quality supporting details and quantity. Critical thinking is weaved into points.	Main points are present with limited detail and development. Some critical thinking is present.	Main points lack detailed development. Ideas are vague with little evidence of critical thinking.
Use of sources	Incorporate appropriate details from lectures and assigned readings, providing evidence thoroughly supporting the discussion	Incorporate some information from lectures and assigned readings but not in an overly thorough manner	Incorporate some information from lectures and assigned readings but vaguely support the discussion	Does not incorporate appropriate information from lectures or assigned readings
Presentation	Use appropriate style and grammar. Easy to comprehend	Use acceptable style and grammar, contains a few errors or mispellings	Use acceptable style and grammar, contains some errors or mispellings, the discussion is understandable	Contain enough distracting grammar or spelling, difficult to understand

Submission

Your file should have the name *yourfirstname-initial* followed by *yourlastname-hw10* (for instance, *UPraphamontripong-hw10*). Submit your file to **Collab**. If you work in group, be sure to include all names in the report. Each team submits only **one** copy.

Making your report available to me and the TAs is **your** responsibility; if we cannot access your file then you will not get credit. Be sure to test access to your file before the due date.
