**Test-Driven Development and Refactoring Memo – due Sept. 30th**

The purpose of this assignment is to explore two Extreme Programming (XP) practices: *test-driven development* and *refactoring*. The practice of test-driven development calls for software developers to create tests *before* code is actually produced. The example in Larman’s Chapter 21 is based on unit testing, but test-driven development can be applied to other tests, such as feature tests, usability tests, load tests, etc. Refactoring is a programming practice aimed at refining code without changing its behavior (it is not debugging). Over time about 100 named refactoring patterns have been identified.

Test-driven development and refactoring are practices that you can apply now in your other classes, and later in an internship or in your career.

In this memo to your supervisor, you will summarize the key points behind test-drive development and refactoring, and you will identify an example of how refactoring can be applied.

**What I want You To Learn**

* The key point of using test-driven development
* Advantages of using test-driven development over test-last development
* The key point, or definition, of refactoring
* Some common refactoring examples (patterns)

**Deliverable**

Please read chapter 21 of [Larman’s book](https://aanimesh.files.wordpress.com/2013/09/applying-uml-and-patterns-3rd.pdf) and review a catalog of refactoring patterns at <http://www.refactoring.com/catalog/index.html>. Write a memo to me in which you address the criteria listed below. Follow the usual memo format and submit your memo to me.

**Criteria for assignment**

1. State the key-point behind test-driven development
2. State the key-point, or definition, of refactoring
3. The author lists 6 advantages to using test-driven development (focusing on unit testing). Besides the first advantage ("The unit tests actually get written") which one of the other 5 advantages do you think is most valuable? Provide a brief rationale.
4. From your past programming experience cite a specific instance in which you have applied one of the refactoring patterns listed in the refactoring catalog. State the name of the pattern and briefly explain how you applied it.

**Grading Rubric**

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| Criteria | Done Well | Need Improvement |
| State the key-point behind test-driven development | Clear statement of the key point | Key point not stated clearly |
| State the key-point, or definition, of refactoring | Clear statement of the key point (or definition) | Key point or definition not stated clearly |
| Besides the 1st ("The unit tests actually get written") which one of the other 5 advantages of test-driven development do you think is most valuable? Provide a brief rationale. | Clearly identified one of the other 5 advantages with your rationale | One of the 5 advantages is not identified clearly |
| Cite specific instance when you applied one of the refactoring patterns in the refactoring catalog. State the pattern name and how you applied it. | Refactoring pattern stated with clear example | One of the patterns is not identified with a well-stated example |