Deliverable 2 Report

Team Members:

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Team Assignments:

Wai Fong – Maintainability Index unit test, Maintainability Index integration test

Shrunga Malavalli – Looping Statement Counter unit test, Halstead integration Test

Linh Nguyen – Method Counter unit test, Method Counter integration test, Looping Counter integration test

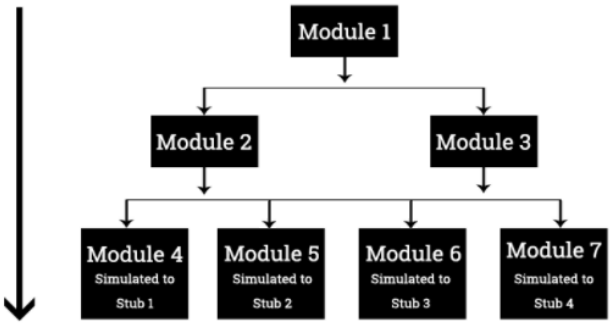
Carly Ott – Halstead Metrics unit test, Halstead Metrics integration test (with Driver), Maintainability Index integration test (with Driver)

Kimi Phan – Cast Counter unit test, Expression Counter unit test, Cast Counter integration test, Expression Counter integration test, Milestone Report

Kayla Rhodes – Comment Counter unit test, Variable Counter unit test, Driver, Comment Counter integration test, Variable Counter integration test, Milestone Report

Testing Framework and Strategy

The testing framework that we chose was top down integration testing.



We picked this testing process as it seemed the most reasonable for testing this project. Using a top down design allows us to see fault localization easier and it has critical modules tested on priority, so we can see major designed flaws and fix them first.

In the second deliverable, we first started to test the overall code and then started testing individual components. The order that we tested our components depended on if there were dependencies. We first tested the variable counter, comment counter, cast counter, expression counter, looping counter, and the method counter because they did not depend on any other classes expect for the eclipse checkstyle class. This would be first level in the call graph. The second level of the call graph would be the Halsted Metrics class because it depends on the expression counter. The third level of the call graph would be the Maintainability Index class because it depends on the comment counter and the Halsted Metrics.

Testing outcomes:

Bugs discovered during unit testing unit testing:

During unit testing we found a few bugs in the MaintainabilityIndex and the ExpressionCounter. In the MaintainabiltiyIndex we discovered in setMaintainabilityIndex(), when calculating cm, which is a double, the values used in the equation were integers and thus caused an incorrect value to be shown. The integers were then casted as a double to correct this issue. In the ExpressionCounter we found out that there had been an extra LE token type and we were missing the STAR token type in getDefaultTokens(). The first error caused the number of operators and unique operators to increment at different times when they should be incrementing at the same time after each token type was visited. To fix this we deleted the extra LE token in getDefaultTokens(). The second error caused the number of operators and unique operators to be one less than expected. To fix this error we added the STAR token type to getDefaultTokens() and added a comparison to the visitToken() for the STAR token.

Bugs discovered during integration testing:

During integration testing we found one bug in HalstedMetrics. The that was found was the result of the expression for calculating hdifficulty which is a double value needed to be cast to a double since it was operating only on integer values and therefore truncating the decimal portion.

Experience summary:

During testing we learned that deriving a call graph before starting integration testing was very useful. It allowed us to see the breakdown of the whole program and see the dependencies between each of the classes. Creating tests for our classes allowed us to see the importance of unit testing and integration testing in discovering bugs that may have been hard to locate without these types of testing.

Deliverable 2 Schedule

Team Meeting: October 9th, 2:00 pm

- Participants: Wai Fong, Shrunga Malavalli, Linh Nguyen, Carly Ott, Kimi Phan, Kayla Rhodes
- Discussed outcome of first deliverable
- Created schedule for deliverable

- Assigned unit testing tasks to each group member

Team Meeting: October 18th, 2:00 pm

- Participants: Wai Fong, Shrunga Malavalli, Linh Nguyen, Kimi Phan, Kayla Rhodes
- Discussed progress with unit testing, unit testing was supposed to be done by this meeting
- Assigned integration testing tasks to each group member

Team Meeting: October 25th: 2:00 pm

- Participants: Wai Fong, Shrunga Malavalli, Linh Nguyen, Carly Ott, Kimi Phan, Kayla Rhodes
- Discussed progress with integration testing, integration testing was supposed to be done by this meeting
- Assigned remaining tasks to each group member: milestone report and refactoring