

Generating Coverage for Regression Testing

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Background

Software development and maintenance are two major parts of the software systems evolution. For instance, adding new features to the software, improving performance to the current version are the common ways of software development; fixing bugs and correcting errors are the ones for software maintenance. After the software is updated, regression testing is applied to the modified version of the software to ensure that it behaves as intended. However, regression testing is costly because, as software grows in size and complexity, a suite accumulates more tests and therefore takes longer time to run. For instance, a 2011 conference paper reports that regression testing of a Microsoft product required several days. Therefore, regression testing execution can be tedious and time consuming.

For our project, we want to find out a solution to improve the performance of regression testing on time consumption without sacrificing the quality of regression testing.

Solution

One possible solution to generate a new coverage report based on regression testing is to combine a test-selection algorithm with a coverage re-computing algorithm. This means we could re-compute the amount of covered lines and the amount of uncovered lines by only running those test cases which are somehow “influenced” by the update in the source code. test-selection algorithms will help figure out which tests to run as regression testing and coverage re-computing algorithms will help compute the overall coverage based on the coverage in part of the test cases.

Impact

This coverage generating system will significantly increase the efficiency of the regression testing of a software, since we don’t need to run the entire test suite to obtain the overall coverage.