

Test Code Coverage

EECS 2311 - Software Development Project

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Second level

Third level

Fourth level

Fifth level

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When is testing done?

- Short answer: Never!
- A bit longer answer: When all features of the system have been tested with all possible inputs that could make a difference
- In practice, this is hard to determine
- Metrics such as code coverage can be used to give an idea of how sufficient the testing is

Statement Code Coverage

- Observe the system as it is running
- Keep track of how many of the statements in the code were executed at least once
- Divide by the total number of statements in the system
- A comprehensive test suite is important
- Typically, it is hard to get high coverage. Anything above 70% is pretty good for a large system

Problems with statement coverage

- A statement must be executed with different values for the relevant variables to be fully tested
- Loop bodies may need to be iterated many times to reveal issues
- Not all statements are equally important
- Only the true branch of an if statement may be executed but coverage may be 90% for the statement if the false branch is one tenth of the size

Other kinds of coverage

- Segment coverage
- Branch coverage
- Multi-condition coverage
- Dataflow coverage
- More in EECS 4313

Software engineering guideline

- Low code coverage indicates that more testing must be done
- High code coverage gives little information about the quality of the testing

See the video demo on JaCoCo

GUI Testing

- In an interactive application, coverage can be low because the GUI code is not executed through the test cases
- Testing the GUI can be done by accessing the GUI components in your test cases and programmatically using them
- This depends on the GUI framework you are using
- For Java FX, one can use a framework called TestFX
 - **See video demo and code link on course website**