

Testing Coverage

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Testing Stages

- Unit – done on relatively small pieces of code, usually by the programmer.
- Integration – done while putting these pieces together to form a system. Test interfaces.
- System – done on fully-integrated system, usually by professional testers.
- Load, stress, performance, security, reliability ...checking specific attributes.

Types of Coverage Used for Assessment

- Code coverage
- Requirements/Specification coverage
- Domain coverage

Code Coverage

(used during unit testing)

- Positive
 - Easy to do and understand
 - Easy to measure
 - Can automate assessment (and there are commercial tools on the market)
 - Points out untested parts of the code
- Negative
 - What do you know about the quality/dependability/reliability of the code when you're done if coverage is high?

Specification Coverage

- Positive
 - Points out untested functionality
- Negative
 - What do you know about the quality/dependability/reliability of the code when you're done if coverage is high?
 - Hard to do without a formal specification
 - Specification must be kept up-to-date
 - Hard to measure
 - Hard to automate assessment

Why Domain Testing?

- What you really want to know is that the program works properly for every possible input. So while code or specification coverage are proxies for this, this is the real deal in the sense that it is directly addressing what you want to assess.

Domain Coverage

- Positive
 - Points out untested parts of the input domain
 - Can form equivalence classes so you don't have to do exhaustive testing
 - Easy to measure if have equivalence classes
- Negative
 - May be hard to form equivalence classes
 - Without equivalence classes will almost always test a negligible percentage of domain
 - Commercial tools?

Sound Grim? It is!

- The Bad News:

Even very basic and flawed coverage measures are not universally used.

- A very biased look for a ray of sunshine.

Automated fault prediction models help target most vulnerable parts of the system, allowing careful focusing on those parts.