Unit, Integration & Functional Testing

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I DON'T ALWAYS TEST MY CODE
BUT WHEN I DO I DO IT IN PRODUCTION
memegenerator.net

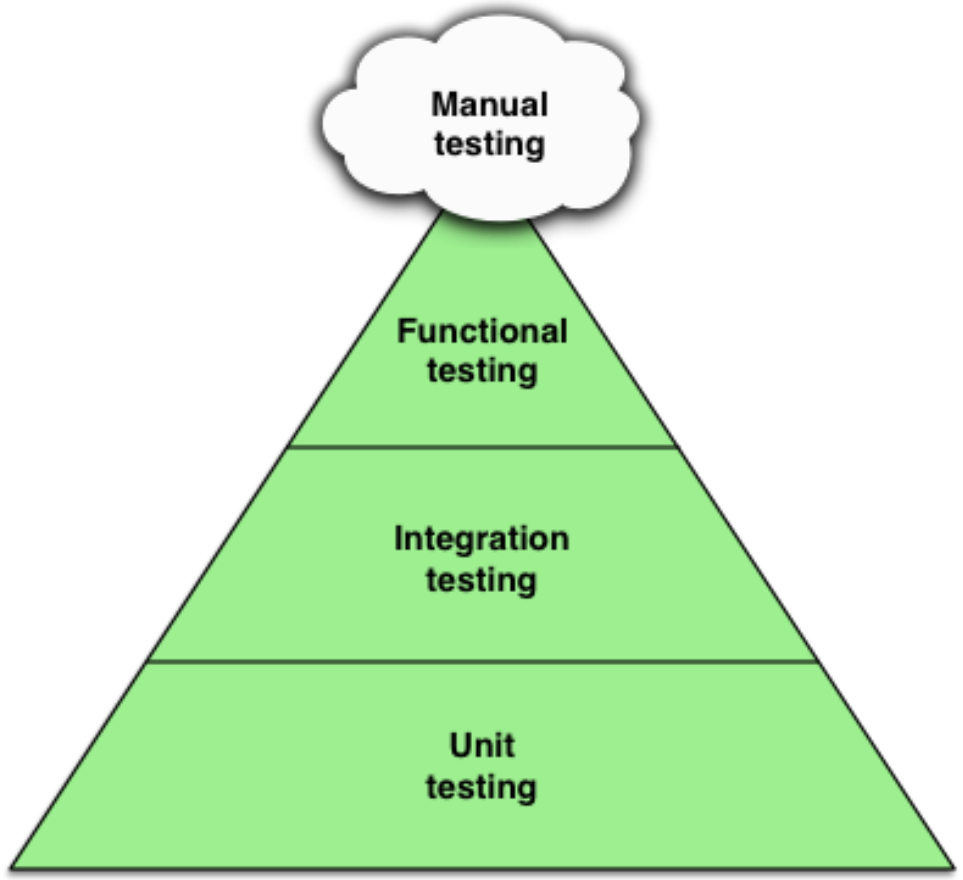
Why Test?

- Testing reduces bugs
- Tests Service as good documentation
- Tests allow for safe refactoring
- Tests reduce the cost of making code changes
- Tests allow you to deliver code with confidence


I'll just add a little feature
Working code

Types of Tests

- There are way too many testing level and types to list them here. We will focus on Unit and Integration tests.



What is Unit Test?

- Unit tests should not require access to any external systems such as network, databases, etc.
- All external systems such as database, file server, etc. are mocked out using specific test APIs and test data.

Unit Tests

- Isolate parts of programs
- Verify that independent part of programs are working correctly
- Unit tests are fast & reliable
- However, Unit tests
  - Take time to build
  - Require maintenance
- Both of these points require significant time and commitment. An incorrect unit test can let bug go thru unnoticed for long time.


I have an ongoing fear that all my unit tests pass, but they're meaningless.

What is Integration Test?

- Integration tests verify that interaction between multiple components (applications, services, modules, etc.) is working as expected.

Integration Test Challenges

- Difficult to test all critical paths
- Hard to find the source of errors
- Requires time and commitment from multiple component owners

Performance/Load/Stress Testing

- Simulate a heavy load on a server, network or object to test its strength or to analyze overall performance under different load types.
- Load testing is also a way to perform a functional test on websites, databases, LDAPs, webservices etc.

Test Impact Analysis

- Test Impact Analysis (TIA) is a modern way of speeding up the test automation phase of a build. It works by analyzing the call-graph of the source code to work out which tests should be run after a change to production code.

Why Test Impact Analysis?

- "Too Many" tests to run prior to check-in
- Developers may ignore tests if it takes too long to run.
- Test Impact Analysis (TIA) is a technique that helps determine which subset of tests for a given set of changes.

Additional Resources

https://csye6225.cloud/