

Homework - Unit Tests

- Questions / comments / concerns?
- One Volunteer to walk through their code and describe what they did to the class

Unit Tests - In Review

- By defining “units” of code, you minimize the amount of code you’re testing at a single time
- Tests should be fast!
- There should be a lot of them (see next slide)
- Refactoring code out makes it easier to test units of code without needing to go through all layers of the app
- Refactoring and unit testing go hand in hand
- Don’t go too far!
 - a unit could be a class, a function, or even a series of functions, but if you have multiple tests for every single line of code, then you’ll be there forever (or you work for NASA)

The Testing Pyramid

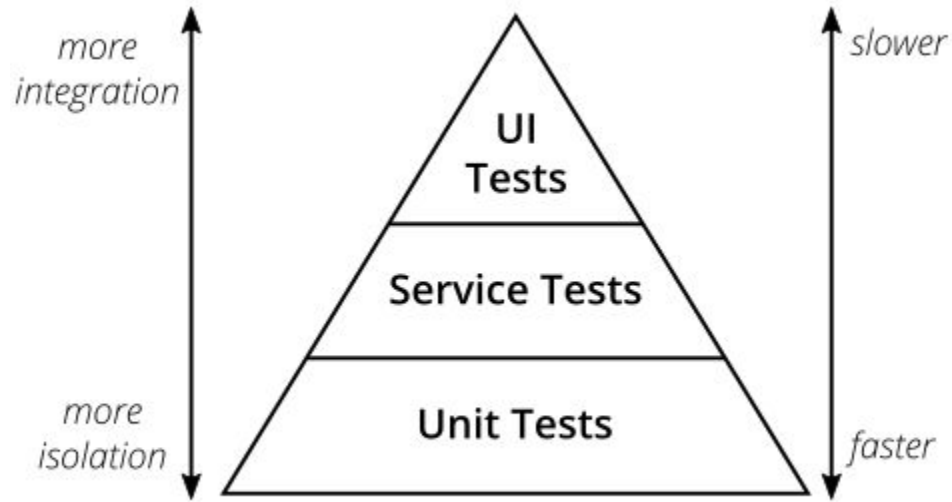


Figure 2: The Test Pyramid

<https://martinfowler.com/articles/practical-test-pyramid.html>

Service Tests -- eg, the stuff in the middle

Most applications will rely on a series of code units to work together to get something done. That's where service layer tests come in. We won't cover these in too much depth, but consider it a "leveling up" from unit tests

Python examples:

https://github.com/TheRightChoyce/work-with/blob/master/recognition/tests/gift_suggestion_tests.py

Test Driven Design (TDD) - Overview

TDD is the practice of writing your tests before you write any of your code. This is also referred to as red-green refactor/refactoring. (E.g. watch your tests go from red to green as you write code).

- Write a test or a series of tests for the code you plan on writing
- Write said code until it all passes
- Refactor tests and code to be cleaner, while still ensuring everything passes
- Repeat

Great when you have detailed specs... huge time sink when you don't

e.g. a massive code sprint just to get stuff done, solo/learning projects, etc..

What is Integration Testing?

- When you build an app, it will almost always integrate with something else (a database, a file system, an API, a cache, etc..)
- Testing between these boundaries is called integration testing
- The goal here is test to see if the different puzzle pieces you've been given connect the way you expect them to.

As with most things in computer science, depending on who you talk to, you'll get a different definition of a particular term.

Integration Testing Rules

Integration tests don't have strict rules (unlike unit tests). However, there are some general rules of thumb to follow.

- The results should be repeatable.
- Tests should be easy to understand.
- Avoid testing 3rd party code.
- Create relevant and extensive logs for failing tests. This should include:
 - Database queries
 - API requests and/ responses
 - Assertion comparisons
- Production code and test code should be separated.

What is UAT (User Acceptance Testing) testing?

UAT tests the validity of the existence of the application. It addresses the following questions:

- Is this what the customer needs?
- Did we build the right thing?

What is functional testing?

Functional testing ensures that the app works from the user's perspective. These tests ignore the internal structure of an application and focuses solely on the interface.

Ex: Ensuring that the login button of an application works as expected.

What is Continuous Integration (CI)?

Continuous Integration is a development practice which requires a team of developers to integrate code into a shared repository several times a day. CI requires building and testing code every time a developer commits changes to version control.

We'll go into this another day. But this is usually where tests live and help stop bad code from being published.

Testing Libraries/Frameworks

- Selenium
- Cucumber (JS and Ruby)
- Gherkin

Examples of Technical Interview Questions

- What is UAT testing?
- Acceptance tests at our company take too long to run. Sometimes they can block a release for over 5 hours. How would you make them faster or more efficient?
- What is test scenario and test case? Please explain in detail. Are there any differences?

Vocabulary

Words you may hear in the job or work environment

- Acceptance Testing
- End-to-End Testing
- Regression testing
- Selenium
- Cucumber (JS and Ruby)
- Gherkin
- Test coverage

Live Coding Demo

- Google.com Test with a functional cucumber installation
- Adding Cucumber to an existing project
- Writing Test for a React Application

Exercise + HW

Link:

https://docs.google.com/document/d/1kpFiiAxL9AZv6DWriJI_HHNm7GnC5wqZkiaTuchdblc/edit?usp=sharing

Suggested Reading

- <https://reqtest.com/testing-blog/a-guide-to-excellent-acceptance-testing/>
- <https://www.geeksforgeeks.org/acceptance-testing-software-testing/>
- <https://cucumber.io/docs/installation/>