Unit Testing w/ GitHub

Quincy Tech Group
Quincy Worx
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What is unit testing?

Unit testing is a software development process where **small testable *units* are individually tested.**

Unit testing

- Testing specific functions
- Testing specific classes

Not unit testing

- Anything hitting a database
- Anything hitting an API

Why unit test?

1. Find bugs now
2. **Stop bugs later**

In a moderately complex codebase, how can you be confident that a simple change will not break something somewhere else in the codebase?

You know someone else will be making modifications to your code - how do you protect your code from being broken?

Answer: unit tests

Automation & Dev Process

- Run tests frequently when developing (keep tests quick)
- Add tests as you develop
- Add tests **before** you develop (TDD)
- Automate tests when pushing to GitHub
  - This also helps insure dependencies are properly configured
- Require passing unit tests to merge pull requests

Demo #1

Implement “trim” function & test it.

Unit, Integration, and System Testing

- Unit testing
  - Automated on git commit or push
  - Slimmed down environment (runs fast)
- Integration testing
  - Tests interaction between components
  - Somewhere in between unit/system
- System testing
  - Production-like environment
  - Tested by non-dev team (e.g., QA team)

Testing at Koneksa

Components: database, API, API client, util library, service 1, service 2....

Unit test does the following (e.g., service 1)

- Instead of mocking API, the API client routes to the API in “test” env
- API uses an in-memory SQLite database when in “test” env

API unit tests test individual functions as well as directly hitting the endpoints.

Takeaway

Is it actually *unit tests*? Who cares, it runs quickly and thoroughly tests the code.

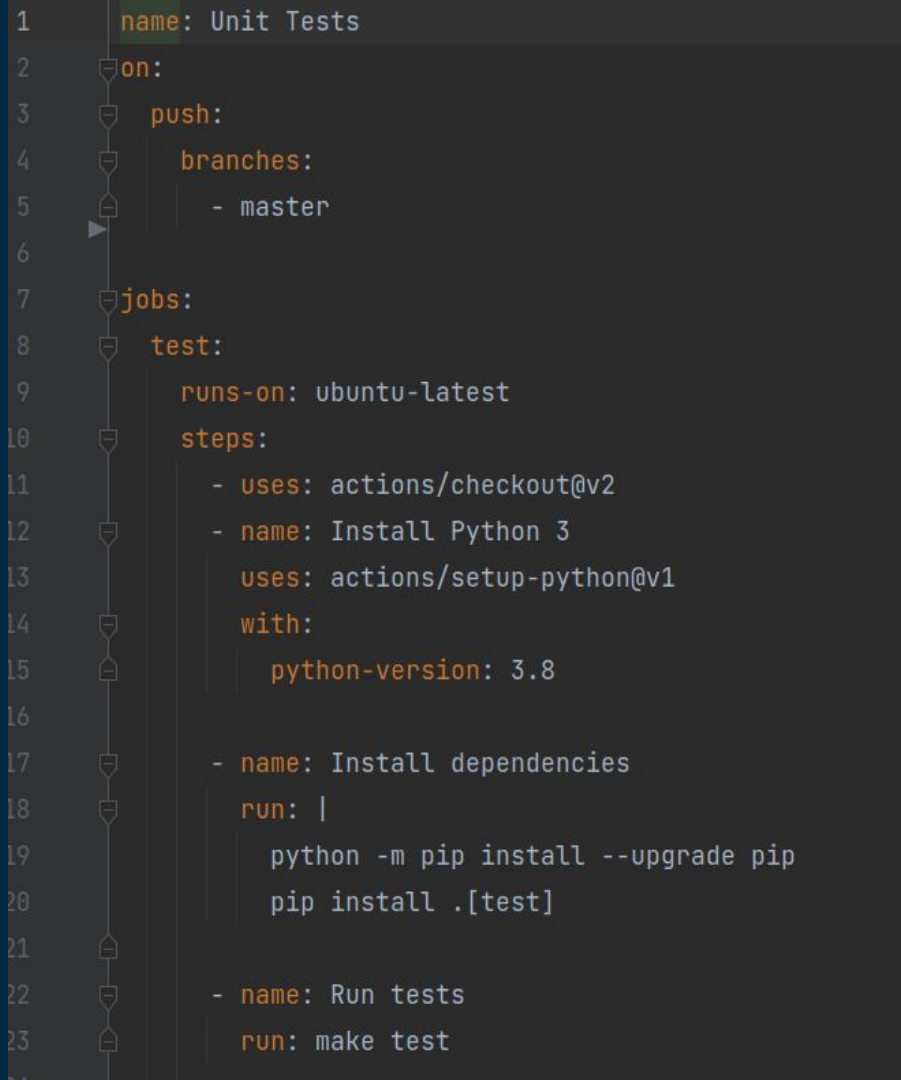
Writing Good Tests

- Code Coverage – shoot for 100%
  - More commonly, set a minimum of 80%
- Test the thing how you use the thing
- Test “happy” and “sad” path
  - Does the software fail properly?

GitHub Actions

.github/workflows/test.yml

Actions are configured to run on events (push, PR, etc.). Actions run plugins or custom code



Demo #2

PyFred – testing an API client and automating unit tests with GitHub Actions.

Next QTG topic?

THANKS

Thank you to Quincy Worx
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