TDD Practices

Topics

- Characteristis of good tests
- What is and why TDD?
- TDD development cycle
- TDD best practices
- TDD anti-patterns

Characteristics of Good Tests

Characters of Good Tests

- Run fast
  - Short setup, run time, tear down
- Run in isolation
  - Tests should not rely on data or state created/modified by other tests
  - Tests should be able to be reordered
- Use data that makes them easy to read and understand
- Use real data whenever possible
  - Use copies of production data if possible
- Repetable

Goals for Well-Written Tests

- Readable by others
- Serve as sample client code for others
- Actually test what they're supposed to test, i.e. that the requirements have been met
- Not tightly coupled to the target code
- Follows Single-responsibility principle

What is and Why TDD?

What is TDD?

- Test-driven development (TDD) is a software development process that relies on the repetition of a very short development cycle
- Requirements are turned into very specific test cases, then the software is improved to pass the new tests, only
- This is opposed to software development that allows software to be added that is not proven to meet requirements.

Why TDD?

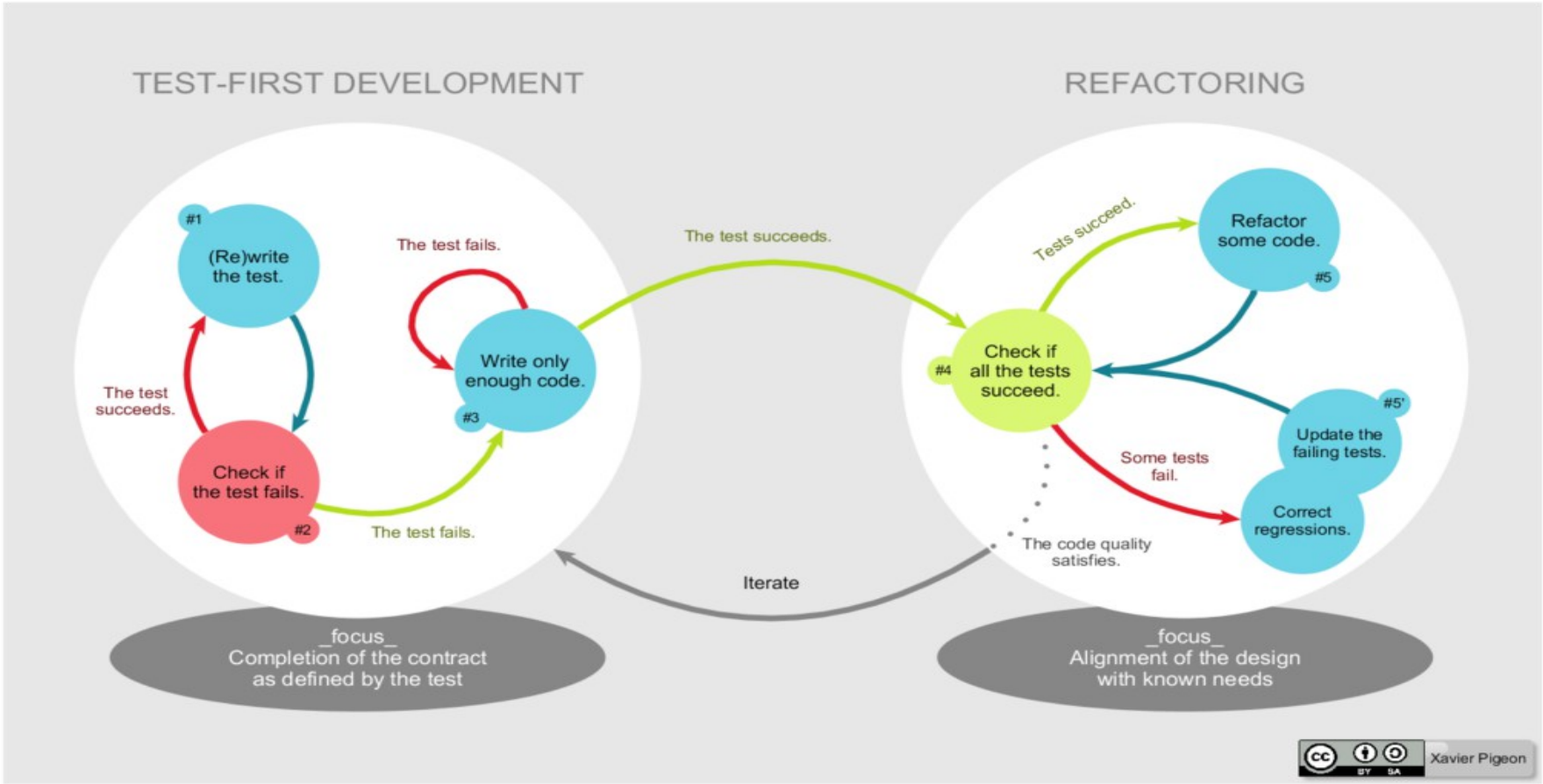
- Enables you to take small steps when writing software
  - > Prefer to add a few new lines of functional code, typically less than ten, before rerunning tests
  - > Prefer to limit the TDD cycle to be less than 2 to 5 minutes
- "The act of writing a unit test is more an act of design than of verification. It is also more an act of documentation than of verification" (Uncle Bob)
  - > The act of writing a unit test closes a remarkable number of feedback loops

TDD Development Cycle

TDD Development Cycle

- Repeat the following
  - Add failing test
  - Run all tests and see if the test fails
  - Write the code to correct the test failure
  - Run test again
  - Refactor code

TDD Development Cycle



TDD Best Practices

TDD Best Practices

- Only specify what is important
- Make small steps
  - Solve things as simply as possible
  - Follow 2 to 5 minute rule – each TDD cycle should not more than 2 to 5 minutes
- Perform refactoring after each passing test
  - Don't lose the best opportunity to refactor
- Make testing code expressive and readable
  - Tesing should serve as pseudo-documentation
  - Example: should_result_this_when_xyz_occurs()

Anti-Patterns

Writing Testable Code

- Do not use Singleton class
  - It is impossible to mock a Singleton
- Get dependencies to be injected
  - Is it impossible to mock the dependencies

Examples of Anti-Patterns

- The free ride
  - Rather than write a new test method for another feature, a new assertion rides along an existing test
- The loud mouth
  - Clutters up the console with diagnostic messages, logging messages, and other chatter, even when passing
- The stranger
  - A test case that doesn't even belong in the unit tests it's part of. It's really testing a separate object
- The local hero
  - A test case that depends on something specific to the development environment, passes on one machine, fails on another

Lab:

Exercise 1: String Calculator
Exercise 2: Movie Rental Application
1655_tdd_practices.zip

Thank You!