

Test Driven Development

Introduction to TDD

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Topic List

– What is Test Driven Development?

– What is Unit Testing?

– The JUnit Framework.

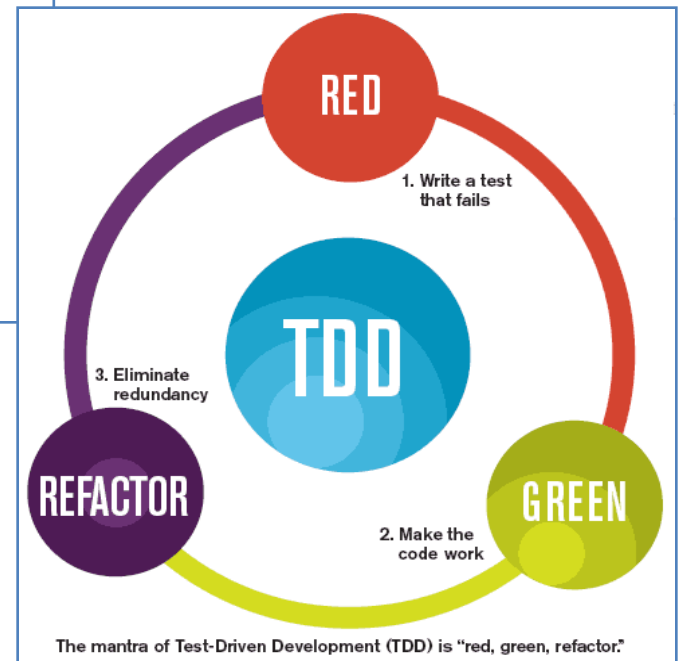
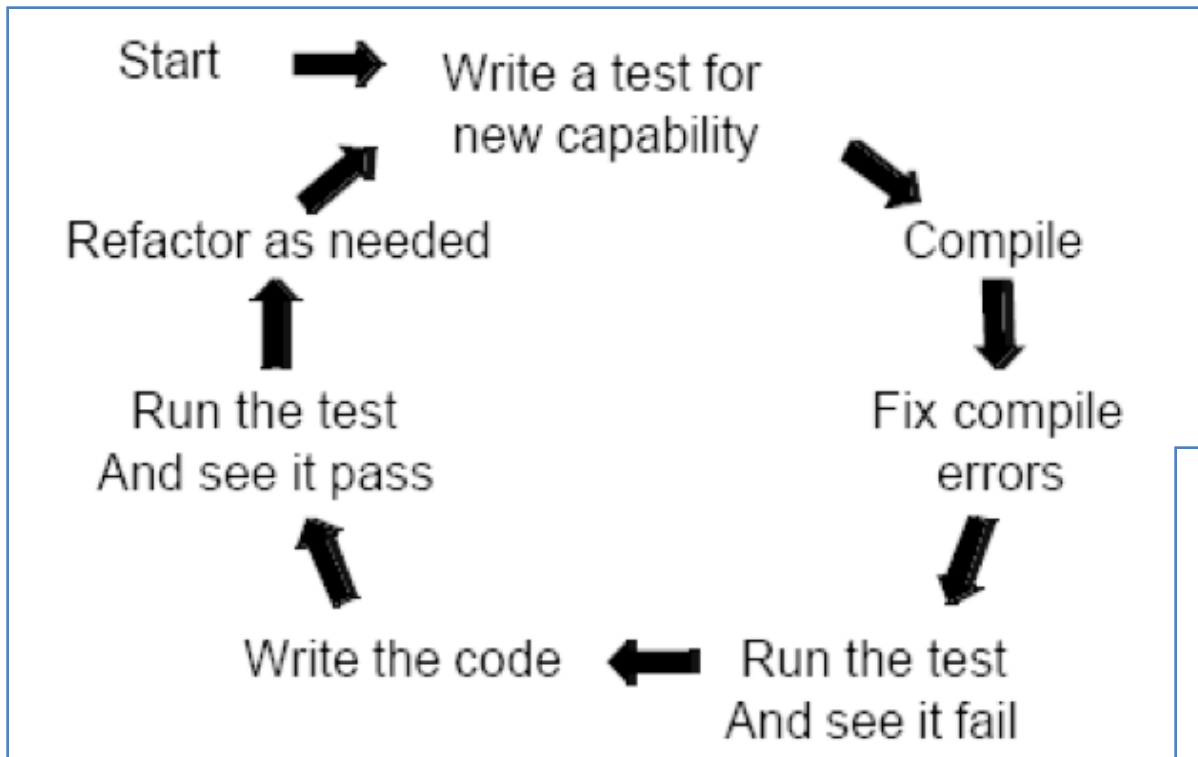
Test Driven Development

- Tests are written before you write the program code.
- A test framework is used so that automated testing can be done after every small change to the code.
 - This may be as often as every 5 or 10 minutes.
- This approach must be learned and practiced.

Why bother with Test Driven Development?

- It makes your designs better.
- Fewer bugs; drastically reduces the amount of time spent debugging code.
- More maintainable code.
- During development, the program always works—it may not do everything required, but what it does, it does right.
- Your new philosophy (axiom):
 - *‘Code that isn’t tested doesn’t work’*

Test-driven development.



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What is Unit Testing?

- A unit test is a piece of code written by a developer that tests (exercises) a very small, specific area of functionality of the code being tested.
 - Usually a unit test exercises some particular method in a particular context.
- Unit tests are performed to prove that a piece of code does what the developer thinks it should do.
- The question remains open as to whether that's the right thing to do according to the customer or end-user:
 - that is acceptance testing

What does Unit Testing Accomplish ?

- *Does the **code** do what was expected?*
 - i.e. is the code fulfilling the intent of the developer?
- *Does the **code** do what was expected all the time?*
 - exceptions get thrown, disks get full, network lines drop, buffers overflow - is the code still performing as expected?
- *Can the **code** be depended upon?*
 - Need to know for certain both its strengths and its limitations.

How is Unit Testing carried out?

- **Step 1:** Decide how to test the method in question before writing the code itself.
- **Step 2:** Write the test code itself, either before or concurrently with the implementation code.
- **Step 3:** Run the test itself, and probably all the other tests in that part of the system.

Key Feature of executing tests: need to be able to determine at a glance whether all tests are succeeding/failing.

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JUnit

- JUnit is a unit testing framework for the Java programming language.
- JUnit has been important in the development of test-driven development, and is one of a family of unit testing frameworks collectively known as xUnit.

JUnit Features

- Open source framework used for writing & running tests.
- Provides Annotations to identify the test methods.
- Provides Assertions for testing expected results.
- Provides Test runners for running tests.
- JUnit tests can be run automatically and they check their own results and provide immediate feedback. There's no need to manually comb through a report of test results.
- Junit shows test progress in a bar that is green if test is going fine and it turns red when a test fails.

“Good programmers write code, great programmers write tests”

“Never, in the field of programming, have so many owed so much to so few”

- Martin Fowler on the developers behind JUnit

**Any
Questions?**





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