

# Test Driven Development

## Introduction to TDD

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# Topic List

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- What is Test Driven Development?
- What is Unit Testing?
- The JUnit Framework.

# Test Driven Development

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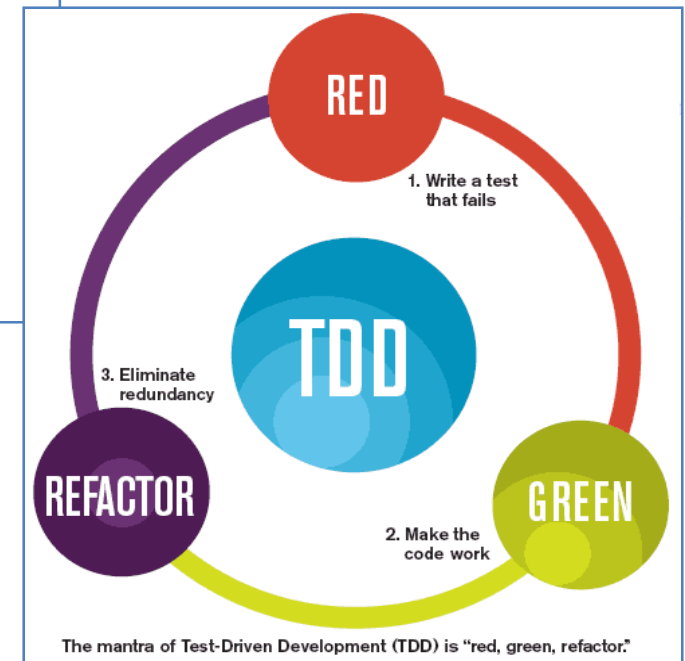
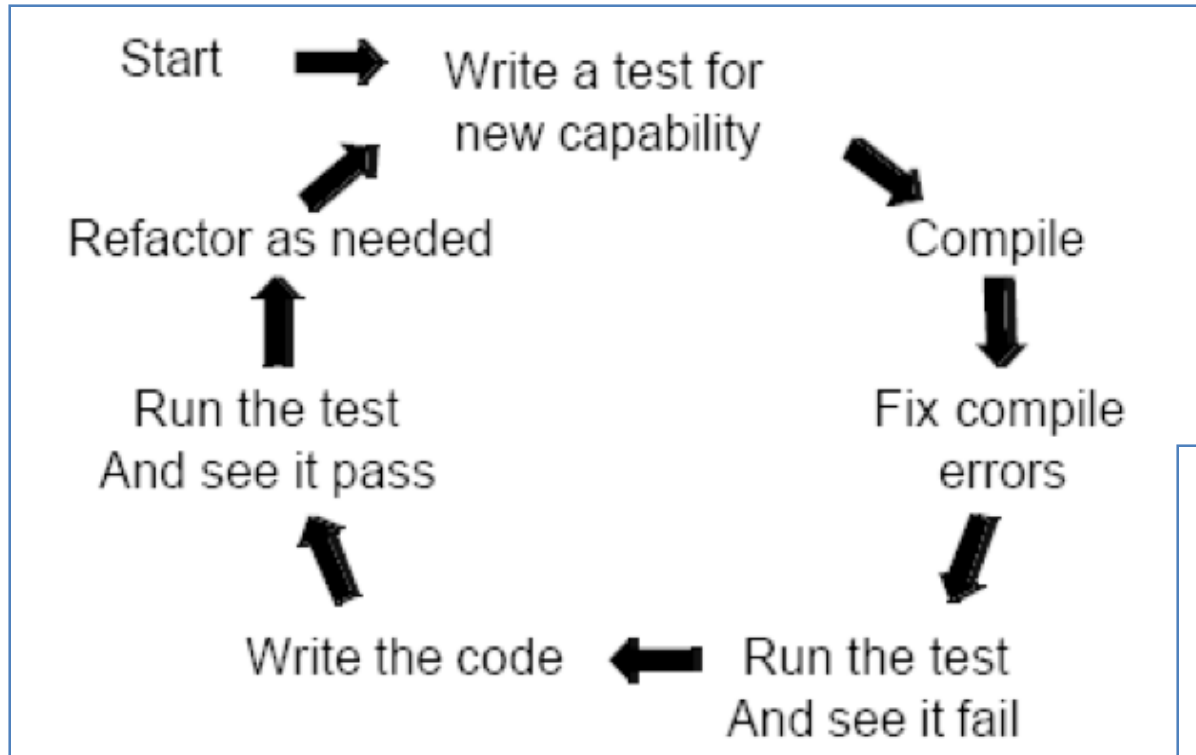
- Tests are written before you write the program code.
- A test framework is used so that automated testing can be done after every small change to the code.
  - This may be as often as every 5 or 10 minutes.
- This approach must be learned and practiced.

# Why bother with Test Driven Development?

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- 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?

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- 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 ?

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- *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?

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- **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

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- 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

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- 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.

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*“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*

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**Any  
Questions?**





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