Behavior Driven Development

with

Cucumber

Agenda

- BDD
- TDD
- BDD in Detail
- Cucumber
- Demo and Hands On

What is BDD

A Behavior-Driven Development (BDD) is a software development process oriented towards meeting the business requirements.

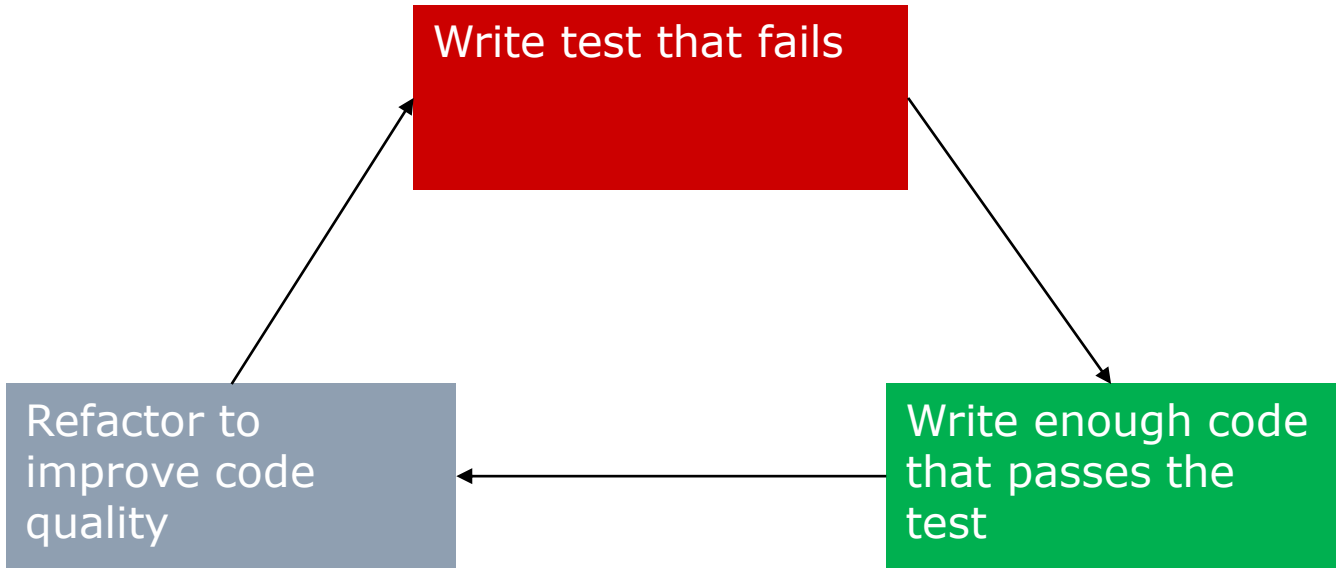
What is TDD

A test-driven development is a software development technique-oriented towards writing tests.

BDD and TDD approaches share common elements

TDD Approach

- A TDD development cycle is often called red/green/refactor.
- Those are three crucial phases of TDD workflow.



BDD in Details

Intention of BDD

- A developer writes test code which cannot be understood by the business team.
- The main intention of BDD is to provide tools that allow technical and non-technical (business-related) people to effectively cooperate.
- Thus, the software is implemented basing on business requirements, especially user scenarios.
- BDD encourages natural, domain-specific languages with which all teams can easily work.
- BDD is a combination of TDD and domain-driven design.

Three Rules of BDD

- Enough is enough
- Deliver value to stakeholders
- It’s all behavior

BDD Workflow

- Identify business feature
- Define scenarios and acceptance criteria for the feature
- Determine steps per scenario
- Write failing test steps for unimplemented feature
- Write code to pass the test steps and
- Refactor the code
- Produce reports

BDD Workflow

- The stakeholder and business analyst discuss and identify the business needs.
- Then, together with the tester, they create stories.
- A story is a documented business requirement.

Sample : A BDD Story in Gherkin

```
Feature: Testing Calculator Functionality
  I want to test the functionality of methods of
calculator

  Scenario: Testing add method of calculator
    Given create an object of calculator
    When I input 4 and 3
    Then add should return 7

  Scenario: Testing divide method of calculator
    Given the created Object of calculator
    When I input 8 and 2
    Then divide should return 4
```

BDD Lifecycle

Image Courtesy: https://www.inspiredtesting.com/news-insights/insights/372-outsource-requirements-for-bdd-projects-to-gtc

Cucumber

What is Cucumber

- Cucumber is a testing framework which supports BDD.
- It thereby allows users to define application operations in plain text.
- It works based on the **Gherkin** Domain Specific Language (DSL).

What is Gherkin DSL

- Gherkin is a line-oriented language using line endings, indentations and keywords to define documents.
- Each non-blank line usually starts with a Gherkin keyword, followed by an arbitrary text, which is usually a description of the keyword.
- The whole structure must be written into a file with the feature extension to be recognized by Cucumber.

Cucumber Feature File in Gherkin

```
Feature: Testing Calculator Functionality
  I want to test the functionality of methods of
calculator

  Scenario: Testing add method of calculator
    Given create an object of calculator
    When I input 4 and 3
    Then add should return 7

  Scenario: Testing divide method of calculator
    Given the created Object of calculator
    When I input 8 and 2
    Then divide should return 4
```

Gherkin: Feature

- We use a Gherkin file to describe an application feature that needs to be tested.
- The file contains the Feature keyword at the very beginning, followed up by the feature name on the same line and an optional description that may span multiple lines underneath.
- Cucumber parser skips all the text, except for the Feature keyword, and includes it for the purpose of documentation only.

Gherkin: Scenario and Steps

- A Gherkin structure may consist of one or more scenarios, recognized by the Scenario keyword.
- A scenario is basically a test allowing users to validate a capability of the application.
- It should describe an initial context, events that may happen and expected outcomes created by those events.

Step Definition File

- A step definition is an annotated Java method with an attached pattern whose job is to convert Gherkin steps in plain text to executable code.
- After parsing a feature document, Cucumber will search for step definitions that match predefined Gherkin steps to execute.

Junit5 and Cucumber

- Cucumber tests can be run with Junit Testing framework

Demo and Hands On