Assignment 03 Test Driven Development

Issued 8 November 2021

Due 5 December 2021

Assignment: **35 marks**

Type: Individual Assignment (code and report)

OVERVIEW

Test Driven Development (TDD) is software development approach in which test cases specify and validate the functionality of the code. The TDD approach, is described as a cycle of Red-Green-Refactor. Run a test, see it fail (red), implement the simplest code to make the test pass (green), and then refactor the code so your test stays green and your code is improved. Following a TDD approach requires creating the test class, creating the test methods, and then creating empty implementations of the code that will eventually become production code.

Using a TDD approach for GUIs is problematic, as testing requires the GUI to exist. One solution is to design UIs that minimise the amount of behaviour in objects that are difficult to test. In this assignment you will develop an application using TDD and the Model-View-Presenter architectural pattern in IntelliJ IDEA and track the development of the application logic using git.

Deliverables

Source and test code, an archive of your git repository, a git log and a report submitted via Canvas.

Due Date

5 December 2021

THE ASSIGNMENT TASK

Introduction

To employ TDD effectively you need a program specification. TDD is very good at detailed specification and validation, but does not help with the overall design process. When TDD is used in conjunction with unit testing, the developer writes a single test i.e. unit test and then just enough production code to fulfil that test. Remember that TDD is a thinking process that results in unit tests, while "unit testing" is writing many small tests that each test one aspect of an object's behaviour.

You will need to separate the application into the user interface, the data and the logic to identify the Model, View and Presenter components. In this assignment the TDD approach will concentrate on the logic only, so there is no need for Mocking frameworks.

ASSIGNMENT REQUIREMENTS

Use JavaFX to create an application to

- Create a user registration form, where a user can sign up by providing an email address and password.
- Your application should check if the email address is well-formed.
- If the email address is not well-formed it is rejected.
- Your application should check if the password has sufficient strength, by requiring that
  - The length of the password to be at least 7 characters in length.
  - The password contain at least 1 letter.
  - The password contain at least 1 digit.
  - The password contain at least 1 character from *^&@!.
- If the password is not sufficiently strong it is rejected.

You will need to decide how your user interface is presented, but remember, stylistic and usability are not requirements for this assignment. Marks are for the TDD approach used to develop the logic of checking the email address and password.

OUTCOMES

The assignment outcomes are

- A JavaFX application that presents a user interface.
- The final source and test code.
- A git log that documents the TDD process as commits to the repository.
- A report (maximum 500 words) describing your thoughts on TDD for GUI development.