Software Testing 2025/6 Portfolio

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1 Outline of the Software Being Tested

The software being tested is a medical drone delivery REST service developed as part of ILP course. The main goal of the service is to deliver medication using an appropriate drone, while avoiding no-fly zones. Each medicine has attributes, such as heating required, cooling required and a size, and drones have matching attributes, such as heating, cooling and capacity.

Being a REST service the software has many endpoints which can be split (roughly) into 2 categories, drone navigation and drone querying. Drone navigation endpoints are any endpoints used to path the drone deliveries and calculate the drones position, and drone querying are endpoints used to select an appropriate drone for a delivery.

The repository with my source code and additional files can be found here

2 Learning Outcomes

1. **Analyze requirements to determine appropriate testing strategies** [default 20%]
   (a) **Range of requirements, functional requirements, measurable quality attributes, qualitative requirements**
   Document 1.1 Requirements in the Software Testing Documents folder of the GitHub repo identifies and lists the system requirements split into functional, measurable and qualitative requirements.
   (b) **Level of requirements, system, integration, unit**
   Document 1.2 Level of Requirements splits these requirements into system, integration and unit level requirements
   (c) **Identifying test approach for chosen attributes**
   Document 1.3 Test Approach for Chosen Attributes chooses a selection of requirements from each section (system, integration and unit) and addresses how testing them would be approached, along with the overall objective for each testing section.
   (d) **Assess the appropriateness of your chosen testing approach**
   Document 1.4 Limitations assess the testing approaches discussed in the previous, highlighting any strengths and limitations of the approach for each section.

2. **Design and implement comprehensive test plans with instrumented code** [default 20%]
   (a) **Construction of the test plan**
   Document 2.1 Test Plan identifies the requirements being tested at each level (system, integration, unit) and details how each requirement will be tested, as well as giving an overview of what the test plan covers
   (b) **Evaluation of the quality of the test plan**
   Document 2.2 Evaluation of Test Plan outlines strengths and weaknesses of the test plan, determining it is suitable for most use-cases other than extreme workloads.
   (c) **Instrumentation of the code** Document 2.3 Instrumentation of the Code outlines test scaffolding and helper functions used during testing.

(d) **Evaluation of the instrumentation** Document 2.4 Evaluation of Instrumentation evaluates the use of instrumentation and how it assisted the testing, and identifies any limitations.

3. **Apply a wide variety of testing techniques and compute test coverage and yield according to a variety of criteria** [default 20%]

   (a) **Range of techniques** Document 3.1 Testing Techniques identifies which testing techniques discussed in lectures were used.

   (b) **Evaluation criteria for the adequacy of the testing** Document 3.2 Adequacy of Testing discusses how adequate the testing was and how it was evaluated.

   (c) **Results of testing** Document 3.3 Results of Testing identifies and discusses the process for each test and the result.

   (d) **Evaluation of the results** Document 3.4 Evaluation of Results evaluates the results from the previous section based on how effectively they validated the requirements.

4. **Evaluate the limitations of a given testing process, using statistical methods where appropriate, and summarise outcomes** [default 20%]

   (a) **Identifying gaps and omissions in the testing process**

   Document 4.1 Gaps in Testing identifies gaps in the testing and how they arise.

   (b) **Identifying target coverage/performance levels for the different testing procedures**

   Document 4.2 Target Levels identifies the target coverage levels for different requirements.

   (c) **Discussing how the testing carried out compares with the target levels**

   Document 4.3 Comparing to Targets discusses how the carried out testing compares to the targets identified in the previous task.

   (d) **Discussion of what would be necessary to achieve the target level**

   Document 4.4 Meeting and Exceeding Targets discusses what could have been done to go above and beyond for each target level.

5. **Conduct reviews, inspections, and design and implement automated testing processes** [default 20%]

   (a) **Identify and apply review criteria to selected parts of the code and identify issues in the code**

   Document 5.1 Code Review reviews my drone query method.

   (b) **Construct an appropriate CI pipeline for the software**

   Document 5.2 Construct a CI Pipeline discusses the construction of my CI pipeline, where I gathered information from and what my next steps would be.

   (c) **Automate some aspects of the testing**

   Document 5.3 Automate Some Aspects of Testing explains how the CI pipeline works, how it was implemented, and how it automates tests.

   (d) **Demonstrate the CI pipeline functions as expected**

   Document 5.4 Demonstrate the CI Pipeline Works as Intended shows that the CI pipeline works and how it handles both correct and incorrect tests