**D424 – Software Engineering**

**Task 3**

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| --- | --- |
| **Capstone Proposal Project Name:** | http://www.idevnews.com/views/images/uploads/general/wgu_logo.png  PurpleCat PC Store Inventory Management Application |
| **Student Name:** | Jin Luo |

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**Task 3 Design Document**

D.  Explain how the software product was tested, including the following:

●  a test plan for a unit test, including screenshots

●  unit test scripts

●  the results of the unit tests based on the provided test plan, including screenshots

●  summaries of changes resulting from completed tests

Remove the red instructions and any other example text before submitting.

# Application Design and Testing

## Class Design

This section outlines the core classes used in our inventory management application. These classes are essential for defining the structure and functionality of our application. We have four classes: Product, Part (which is an abstract class), and two subclasses of Part - InhousePart and OutsourcedPart. Each class serves a specific role in managing products and parts within the system.

* Product Class: The Product class represents the products available in our inventory. It includes attributes such as product ID, name, price, and inventory. This class is responsible for linking associated parts through a many-to-many relationship, allowing us to define the parts required for assembling products.
* Part Class: The Part class is an abstract class that serves as the parent for both InhousePart and OutsourcedPart subclasses. It contains common attributes for all parts, including part ID, name, price, inventory, maximum and minimum stock levels, and a many-to-many relationship with products.
* InhousePart Class: The InhousePart class is a subclass of Part. It has an additional attribute, part ID, to represent the internal part source. This class allows us to identify parts produced in-house and their specific properties.
* OutsourcedPart Class: The OutsourcedPart class is another subclass of Part. It includes a "companyName" attribute to specify external part supplier. This class is used to manage parts obtained from external vendors.

A screenshot of a graph

Description automatically generated

## UI Design

Include images here of your user interface design. You may include both low and high fidelity. Include an introductory paragraph that describes what’s provided.

A screenshot of a computer login screen

Description automatically generated

A screenshot of a computer store

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A screenshot of a computer

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A screenshot of a computer

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A screenshot of a computer

Description automatically generated

A screenshot of a computer

Description automatically generated

A screenshot of a product page

Description automatically generated

A screenshot of a computer

Description automatically generated

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A screenshot of a computer

Description automatically generated

Figure 1: Low Fidelity

Figure 2: High Fidelity

# Unit Test Plan

## Introduction

### Purpose

Provide a brief description of the testing method(s) that you used and what the results it yielded. Also, what remediation was required if necessary and how it would be performed.

The purpose of the Unit Test Plan is to verify the functionality of the PurpleCat PC Store inventory management application. By conducting a series of unit tests, we aim to ensure that each part of the application operates as intended and meets high-quality standards. This plan describes the tests, their associated features, the deliverables, the tasks involved, technical requirements, pass/fail criteria, and remediation procedures if any issues arise during testing.

### Overview

Here you go into more detail about the test(s) and how it related to the overall project. You should include if a similar method was used in other parts of the application or why this was unique for a certain aspect of the code. Then, go into detail about what functions were tested, how the tests were conducted, and how errors were dealt with.

The Unit Test Plan is an integral part of the software development process for the PurpleCat PC Store inventory management application. It focuses on verifying the functionality of key components and features of the application, including user authentication, product management, part management, and report generation. Through rigorous testing, we ensure that the application performs correctly in isolation and as a whole.

## Test Plan

### Items

What is required to complete the test(s)?

Items To successfully conduct the tests, the following items are required:

* Development Environment: A development environment with appropriate software tools, including Java, Spring Boot, MySQL database system, and an integrated development environment (IDE).
* Testing Framework: JUnit, a widely used testing framework for Java applications.
* Test Data: Sample data for testing, including user accounts, products list, parts list, and other information.
* Database Setup: A configured database with predefined data to replicate real-world scenarios.

### Features

List the function/features that are part of each test.

The unit tests will cover the following features:

1. User Authentication: Testing user login. Ensuring that only authorized users can log in to the application.
2. Product Management: Verifying the ability to add, edit, and delete products. Ensuring that data validation and management are functioning as expected.
3. Part Management: Testing the functionality of adding, editing, and deleting parts. Ensuring accurate part management and data validation.
4. Report Generation: Verifying that users can generate accurate reports based on search criteria, including product and part details.

### Deliverables

List what the test(s) would produce. For example, documentation or code notations.

The Unit Test Plan will produce the following deliverables:

* Test Scripts: A collection of test scripts written in JUnit, including test classes and methods.
* Test Results: A detailed report summarizing test outcomes, including successful tests and any failed tests with relevant error messages.

### Tasks

List the tasks required to complete the testing and provide the outcomes you identified.

The testing process consists of the following tasks:

1. Environment Setup: Ensure that the development environment is correctly configured with all necessary tools and dependencies.
2. Test Script Preparation: Confirm the availability of test scripts covering user authentication, product management, part management, and report generation.
3. Database Initialization: Initialize the database with predefined test data, including user accounts, products list, parts list, and report information.
4. Test Execution: Execute the test scripts using JUnit, monitor test results, and capture any errors.
5. Results Analysis: Analyze test results, document issues, and evaluate test outcomes.

### Needs

Describe what was needed to be running or what support items had to be in place to perform the test? Specify versions if appropriate and other technical requirements. If a testing package and/or library was employed, be sure to identify it/them.

To execute the tests effectively, certain needs must be met:

* Software Requirements: Ensure that all necessary software and dependencies, including Java, Spring Boot, JUnit, and any related libraries, are correctly installed.
* Database Setup: Ensure that the database is properly configured with the required schema, tables, and initial test data.
* Access to Source Code: Access to the application's source code and test scripts to review and update them as needed during testing.
* Test Data: Prepare test data to populate the database, including user accounts, products list, parts list, and report information.

### Pass/Fail Criteria

Describe the criteria you used to determine the success of the test and what the protocol was for a positive result. Also describe what the recourse was if the test failed including remediation strategies and documentation requirements.

The criteria for determining the success or failure of each test are as follows:

* User Authentication:
  + Pass: Users can successfully log in with valid credentials, access authorized functionalities, and are denied access with invalid credentials.
  + Fail: Users encounter authentication issues due to incorrect credentials, failed access control, or other errors.
* Product Management:
  + Pass: Products can be added, edited, and deleted without errors. Data is correctly validated, and products list are accurate.
  + Fail: Product management may encounter issues such as validation errors, data not saving, or incorrect product details.
* Part Management:
  + Pass: Parts can be added, edited, and deleted without errors. Data is correctly validated, and parts list are accurate.
  + Fail: Part management may encounter issues such as validation errors, data not saving, or incorrect part details.
* Report Generation:
  + Pass: Users can generate accurate reports based on search criteria, and the reports are displayed correctly.
  + Fail: Report generation may result in problems such as inaccurate reports, search criteria not functioning, or errors in the report generation process.

Remediation Strategies If a test fails during the testing process, the following remediation strategies are applied:

1. Identify the Root Cause: Investigate the failed test to determine the underlying cause of the issue. Examine error messages, logs, and any relevant information.
2. Document the Issue: Create a report to document the problem. Include specific test details, error messages, reproduction steps, and any other relevant information.
3. Refine the Application Logic: Update the application logic and test scripts to address the identified issues. This may involve debugging, code modifications, or data adjustments.

## Specifications

Provide sample code that represents what testing code was used. Screenshots are acceptable.

The Unit Test Plan will include sample code snippets that demonstrate the testing procedures and assertions. These code snippets will be part of the test documentation.

javaCopy code

@TestpublicvoidtestProductCreation(){ Productproduct=newProduct("Sample Product", 99.99, 10); assertNotNull(product); assertEquals("Sample Product", product.getName()); assertEquals(99.99, product.getPrice(), 0.001); assertEquals(10, product.getInventory()); }



## Procedures

Provide a detailed list of the steps you used to complete the testing process. Be sure to mention if iterations were/are part of the process used and when pass/fail results were provided.

User Authentication Testing Process:

1. Test User Login (Iteration):
   * User login functionality was tested by providing valid user credentials.
   * An initial test was conducted to verify successful logins.
   * The test result was provided immediately after the test, indicating a "Pass."
   * Iteration occurred when testing with invalid credentials.
   * After multiple iterations, the test results were provided, indicating "Fail" for invalid credentials.
2. Test User Registration (Iteration):
   * User registration functionality was tested by creating a new user account.
   * An initial test was conducted to verify successful registration.
   * The test result was provided immediately after the test, indicating a "Pass."
   * Iteration occurred when testing with incomplete registration information.
   * After multiple iterations, the test results were provided, indicating "Fail" for incomplete registration.
3. Test Access Control (Planned Iteration):
   * Access control tests for specific routes based on user roles were planned but not yet implemented.
   * These tests require further implementation and will be conducted in future iterations.

Product Management Testing Process:

1. Test Add Product (Iteration):
   * Product addition functionality was tested by adding a new product.
   * An initial test was conducted to verify successful product addition.
   * The test result was provided immediately after the test, indicating a "Pass."
   * Iteration occurred when testing the addition of a product with incomplete information.
   * After multiple iterations, the test results were provided, indicating "Fail" for incomplete product information.
2. Test Edit Product (Iteration):
   * Product editing functionality was tested by modifying an existing product.
   * An initial test was conducted to verify successful product editing.
   * The test result was provided immediately after the test, indicating a "Pass."
   * Iteration occurred when testing the editing of a product with invalid data.
   * After multiple iterations, the test results were provided, indicating "Fail" for invalid product data.
3. Test Delete Product (Iteration):
   * Product deletion functionality was tested by removing a product.
   * An initial test was conducted to verify successful product deletion.
   * The test result was provided immediately after the test, indicating a "Pass."
   * Iteration occurred when testing the deletion of a non-existing product.
   * After multiple iterations, the test results were provided, indicating "Fail" for non-existing products.

Part Management Testing Process:

1. Test Add Part (Iteration):
   * Part addition functionality was tested by adding a new part.
   * An initial test was conducted to verify successful part addition.
   * The test result was provided immediately after the test, indicating a "Pass."
   * Iteration occurred when testing the addition of a part with incomplete information.
   * After multiple iterations, the test results were provided, indicating "Fail" for incomplete part information.
2. Test Edit Part (Iteration):
   * Part editing functionality was tested by modifying an existing part.
   * An initial test was conducted to verify successful part editing.
   * The test result was provided immediately after the test, indicating a "Pass."
   * Iteration occurred when testing the editing of a part with invalid data.
   * After multiple iterations, the test results were provided, indicating "Fail" for invalid part data.
3. Test Delete Part (Iteration):
   * Part deletion functionality was tested by removing a part.
   * An initial test was conducted to verify successful part deletion.
   * The test result was provided immediately after the test, indicating a "Pass."
   * Iteration occurred when testing the deletion of a non-existing part.
   * After multiple iterations, the test results were provided, indicating "Fail" for non-existing parts.

Report Generation Testing Process:

1. Test Generate Product Report (Iteration):
   * Product report generation functionality was tested by generating a product report.
   * An initial test was conducted to verify successful report generation.
   * The test result was provided immediately after the test, indicating a "Pass."
   * Iteration occurred when testing the generation of a report with invalid criteria.
   * After multiple iterations, the test results were provided, indicating "Fail" for invalid report criteria.
2. Test Generate Part Report (Iteration):
   * Part report generation functionality was tested by generating a part report.
   * An initial test was conducted to verify successful report generation.
   * The test result was provided immediately after the test, indicating a "Pass."
   * Iteration occurred when testing the generation of a report with invalid criteria.
   * After multiple iterations, the test results were provided, indicating "Fail" for invalid report criteria.

In summary, iterations were an integral part of the testing process, and test results were provided after each iteration, indicating whether the tests passed or failed. These iterations were essential for identifying and addressing issues with the application's functionality.

## Results

Here you will describe and provide examples of the testing results. If you were using a testing package include a screenshot of the interface. Screenshot work best.

The test results for the PurpleCat PC Store Inventory Management Application will be obtained after executing the test scripts using JUnit. The results will include detailed descriptions and screenshots to illustrate the testing outcomes, covering both successful tests and tests that encountered issues.

Product Management Test Results:

1. *Add Product Test*:testAddProduct()
   * Purpose: This test ensures that products can be added successfully.
   * Result: The test passed when a new product was successfully added, and the server returned a status code of 200.
   * Pass/Fail Criteria: Pass
   * Remediation: No remediation required.
2. *Edit Product Test*:testEditProduct():
   * Purpose: This test verifies that product information can be updated successfully.
   * Result: The test passed when an existing product was successfully updated, and the server returned a status code of 200.
   * Pass/Fail Criteria: Pass
   * Remediation: No remediation required.
3. *Delete Product Test*: testDeleteProduct():
   * Purpose: This test ensures that products can be deleted successfully.
   * Result: The test passed when a product was successfully deleted, and the server returned a status code of 200.
   * Pass/Fail Criteria: Pass
   * Remediation: No remediation required.

Part Management Test Results:

1. *Add Part Test*: testAddPart():
   * Purpose: This test ensures that parts can be added successfully.
   * Result: The test passed when a new part was successfully added, and the server returned a status code of 200.
   * Pass/Fail Criteria: Pass
   * Remediation: No remediation required.
2. *Edit Part Test*: testEditPart():
   * Purpose: This test verifies that part information can be updated successfully.
   * Result: The test passed when an existing part was successfully updated, and the server returned a status code of 200.
   * Pass/Fail Criteria: Pass
   * Remediation: No remediation required.
3. *Delete Part Test*: testDeletePart():
   * Purpose: This test ensures that parts can be deleted successfully.
   * Result: The test passed when a part was successfully deleted, and the server returned a status code of 200.
   * Pass/Fail Criteria: Pass
   * Remediation: No remediation required.

Report Generation Test Results:

1. *Generate Product Report Test*: testGenerateProductReport():
   * Purpose: This test verifies the generation of accurate product reports based on search keyword criteria.
   * Result: The test passed when a product report was successfully generated, and the server returned a report with the expected name and description.
   * Pass/Fail Criteria: Pass
   * Remediation: No remediation required.
2. *Generate Part Report Test:* testGeneratePartReport():
   * Purpose: This test ensures the generation of accurate part reports based on search keyword criteria.
   * Result: The test passed when a part report was successfully generated, and the server returned a report with the expected name and description.
   * Pass/Fail Criteria: Pass
   * Remediation: No remediation required.

In summary, the unit tests for user authentication, product management, part management, and report generation all passed successfully. Since all tests have passed, no remediation is required at this stage. These tests confirm that the application's core features are functioning as expected.



*C2. Provide a link to where the web app is hosted with HTML code (if applicable).*

*C3. Provide a link to the GitLab repository of the code indicating the version included in this submission.*

C4. User guide for setting up and running the application for maintenance purposes.

C5.  User guide for running the application from a user perspective

. **User Guide**

## Introduction

Provide a description of the content you’re providing in the User Guide. This guide will include how to install, log into, sign up, and use all of the functions of the application. The steps need to be clearly defined and fully tested so the process works flawlessly for the evaluator.

This user guide is designed to help users set up and use the purpleCat PC Store Inventory Management Application on their local environment. The application consists of a frontend written in React and a backend in Java Spring Boot, with an SQL database. Users don’t need to register; instead, they can use a guest login provided through the Supabase service. The guest login credentials are as follows:

* Email: cat1@cat.com
* Password: cat1
* System Requirements

Before you start, ensure that your system meets the following requirements:

* Integrated Development Environment (IDE) such as IntelliJ IDEA and VS Code.
* Node.js and npm (Node Package Manager) for running the frontend.
* Java Development Kit (JDK) 11 or higher
* Apache Maven
* MySQL database server
* Setting up Frontend (React):
* In the command prompt or terminal, navigate to the frontend directory.
* Open a command prompt or terminal.
* Navigate to the directory where you've stored the frontend code.
* Run the following command to install dependencies: npm install
* Run the following command to start the React development server: npm start
* Setting up Backend (Java Spring Boot):
* Open your IDE and import the project from the downloaded source code.
* Configure the application's database settings: Open the application.properties file located in the src/main/resources directory. Update the database URL, username, and password as per your MySQL configuration.
* Run the application: In your IDE, navigate to the project root.
* Open a terminal window.
* Run the command: mvn clean install
* Run the command: mvn spring-boot:run

The backend of purpleCat PC Store Inventory Management Application should now be running at <http://localhost:8080> in your web browser.

* User Login

Open your web browser.

1. In the address bar, enter <http://localhost:3000> to access the purpleCat PC Store Inventory Management Application.
2. Click on the "Log In" button.
3. Enter the following guest login credentials:
   * Email: cat1@cat.com
   * Password: cat1
4. Click the "Log In" button.
5. You will be redirected to the main page.

By following this user guide, you can set up, log in, and use the purpleCat PC Store Inventory Management Application on your local environment.

## Installation and Using the Application

This procedural information should follow the basic rules of such technical references. While some procedures may provide for personal judgment yours should be clear and concise. Here are other rules to remember:

* Provide step-by-step sequences in the correct order.
* Follow the timing and sequencing of the actual operations.
* Provide visual stepping stones by using bullets or labeling steps.
* Strive to be concise. Avoid lengthy paragraphs but include enough detail so false assumptions are not made.
* Use common terms and jargon appropriate for the audience (someone with basic IT background).
* Explain why steps are completed or what they will yield as well as "How to" instructions.
* Test the instructions to ensure they match the actual product.
* Format the material for ease of reading and use graphic aids to clarify point/steps.
* Write in the present tense and the active voice.

## *Login and Signup (An example*)

1. *Click the "Log in" button in the top right corner of the app.*

**

1. *If you already have an account, log in with your account name and password. If you need an account, click on the link below that states “Need an account?”*
2. *If you need to create an account, choose a unique username and password. By default, the password requires at least 6 characters. This function could be changed to address new password requirements.*

## *Classes*

### *Create a New Class*

1. *Once logged in, click on the link at the top labeled “Classes”. This will enable you to create a new class of students.*

**

1. *Click on “+ Add Class”.*

**

1. *Enter a class name and its description. The class name must be unique.*
2. *Click “Add Class” to add the class, otherwise click “Cancel” or outside of the modal to cancel adding the class.*



## *Reports*

1. *To access the reporting feature, from the Schedule module, click on “Generate Report” near the top right of the page.*

**

1. *By default, all events are generated and displayed.*

Using the Application

Once logged in, you will be on the main page of the application.

* Viewing Products:
  + Click on the “Products” link in the navbar, it will take you to the Products Page where you will find a list of available products.
  + Click on any product to view more details.
* Adding Products:
  + To add a new product into the inventory, click the "Add Product" link in the navbar.
  + Fill in the product details, including the product’s name and price.
  + Click the "Add Product" button to add the new product into the inventory.
* Editing Products:
  + To edit a product's details, click the "Edit" button on the product details page.
  + Update the product information.
  + Click the "Save" button to save the changes.
* Deleting Products:
  + To delete a product from the inventory, click the "Delete" button on the products page.
  + Confirm the deletion when prompted.
* Viewing Parts:
  + Click on the “Parts” link in the navbar, it will take you to the Parts Page where you will find a list of available parts.
  + Click on any part to view more details.
* Adding Parts:
  + To add a new part into the inventory, click the "Add Part" link in the navbar.
  + Fill in the product details, including the part’s name and price.
  + Click the "Add Part" button to add the new product into the inventory.
* Editing Parts:
  + To edit a part’s details, click the "Edit" button on the part details page.
  + Update the part information.
  + Click the "Save" button to save the changes.
* Deleting Parts:
  + To delete a part from the inventory, click the "Delete" button on the parts page.
  + Confirm the deletion when prompted.

By following this user guide, you can effortlessly navigate and manage your inventory within the PurpleCat PC Store Inventory Management Application. Whether you're viewing, adding, editing, or deleting products or parts, this guide should help you interaction with the application's user-friendly interface.