**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 |
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**Task 3 Design Document**

# 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.

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## UI Design

In this section, we present the user interface design for our Inventory Management Application. Below, you'll find images that showcase our user interface design, providing an overview of the features and pages we've developed in our application.

* User Login Page: Our User Login Page serves as the entry point to the application, ensuring secure access for authorized users.

A screenshot of a computer login screen

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* Home Page with Main Menu: The home page serves as your central hub within the application. It offers a user-friendly interface with a main menu that provides quick navigation to other pages.

A screenshot of a computer store

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* Products Page: This is where users can manage products, including searching, adding, updating, buying, and deleting products. Additionally, users can generate reports to gain insights into product-related data.

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* Parts Page: The parts page has similar functionalities to products. Users can search for parts, add in-house or outsourced parts, update part information, delete parts, and generate reports.

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* Outsourced Part Detail Page: This page offers a deep dive into the details of outsourced parts, provides information about outsourced parts.

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* Inhouse Part Detail Page: Here, you'll find detailed information about inhouse parts.

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* Product Detail Page: The Product Detail Page offers a comprehensive overview of the individual product. Users can add new products or update the details of existing ones. Users can associate available parts with the selected product. This page also provides a list of parts associated with the selected product.

A screenshot of a product page

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* About Page: The About page provides information about PurpleCat PC Store.

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# link to Web App Hosted

<https://purplecat-pc-store.netlify.app>

# link to GitLab Repository

<https://gitlab.com/wgu-gitlab-environment/student-repos/jluo8/d424-software-engineering-capstone/-/tree/working_branch>

# GitLab Repository Branch History

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# User Guide for Setting Up and Running the Application

**For Maintenance Purposes**

***Installation and Using the Application***

## Introduction

This user guide is designed to assist users in setting up and using the PurpleCat PC Store Inventory Management Application in their local environment. The application consists of a frontend built with React and a backend developed using Java Spring Boot, connected to a MySQL database. Users are registered by the company’s admin, so they do not need to go through a separate registration process; instead, they can use a guest login provided through the Supabase service. The guest login credentials are as follows:

* Email: ***cat1@cat.com***
* Password: ***1234***

## 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) 17 or higher
* Apache Maven
* MySQL database server

## Setting up Frontend (React)

1. Download the source code.
2. Open a command prompt or terminal.
3. In the command prompt or terminal, navigate to the directory where you've stored the frontend code. (“my-frontend”)
4. Run the following command to install dependencies: ***npm install***
5. Run the following command to start the React development server: ***npm start***

The frontend of PurpleCat PC Store Inventory Management Application should now be running at [http://localhost:3000](http://localhost:3000/) in your web browser.

## Setting up MySQL Database

1. Open MySQL Workbench.
2. Create a new schema named “pc\_shop” in the connected server.

## Setting up Backend (Java Spring Boot)

* Open your IntelliJ IDEA and open 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.
* Replace “spring.datasource.url” with the URL of your MySQL database.
* Replace “spring.datasource.username” with your MySQL database username.
* Replace “spring.datasource.password” with your MySQL database password.

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 clean 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***](http://localhost:3000) to access the PurpleCat PC Store Inventory Management Application.
2. Enter the following guest login credentials:
   * Email: ***cat1@cat.com***
   * Password: ***1234***
3. Click the "Login" button. You will be redirected to the Home 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.

# User Guide for Running the Application from A User Perspective

Using the Application

## User Login Page

Open your web browser.

1. In the address bar, enter [***http://localhost:3000***](http://localhost:3000) to access the PurpleCat PC Store Inventory Management Application.
2. Enter the following guest login credentials:
   * Email: ***cat1@cat.com***
   * Password: ***1234***
3. Click the "Login" button.
4. You will be redirected to the Home page.

A screenshot of a computer

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## Home Page

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

### User Logout:

Click the “Logout” button on the Home page, and you will be logged out. It will take you to the “Login” page.

A screenshot of a computer

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## Products Page

### View Products

* + Click on the “Products” link in the navbar, it will take you to the Products Page where you will find a list of products.

A screenshot of a computer

Description automatically generated

### Add 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" button to add the new product into the inventory.

A screenshot of a computer

Description automatically generated

### Update Products

* + To edit a product's details, click the "Update" button on the Products page. It will take you to the Product Detail page.
  + Update the product information.
  + Click the "Update" button to save the changes.

A screenshot of a computer

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### Buy Products

* + To buy a product from the inventory, click the "Buy Now" button on the Products page.
  + Click “Ok” when prompted with the message “Product bought successfully”.
  + The Inventory number will decrease by 1.

A screenshot of a computer

Description automatically generated

Users cannot buy a product if the inventory is 0.

The system will display the message: “Purchase unsuccessful, product is out of stock!”

A screenshot of a computer

Description automatically generated

### Delete Products

* + To delete a product from the inventory, click the "Delete" button on the Products page.
  + Confirm the deletion when prompted.

A screenshot of a computer

Description automatically generated

## Parts Page

### View Parts

* + Click on the “Parts” link in the navbar, it will take you to the Parts Page where you will find a list of parts.

A screenshot of a computer

Description automatically generated

### Add Parts

* + To add a new part into the inventory, click the "Add Inhouse Part" or “Add Outsourced Part” link in the navbar.
  + Fill in the part details, including the part’s name, price, inventory, Max inventory, Min inventory and part inhourse ID or company name.
  + Click the "Add" button to add the new part into the inventory.

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A screenshot of a computer

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### Update Parts

* + To edit a part’s details, click the "Update" button on the Parts page. It will take you to “Outsourced Part Detail” page or “Inhourse Part Detail” page.
  + Update the part information.
  + Click the "Update" button to save the changes.

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A screenshot of a computer

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### Delete Parts

* + To delete a part from the inventory, click the "Delete" button on the Parts page.
  + Confirm the deletion when prompted.

A screenshot of a computer

Description automatically generated

Users cannot delete a part if it is associated with products.

The system will display the message: “Part cannot be deleted due to existing associations with products.”

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Description automatically generated

## Generate Reports

### Generate Reports for Products

On the Products page, you can enter a keyword in the search bar, click 'Search' to display the results on the page, and then click 'PDF Report' to navigate to the PDF report page, where you can download or print the report.

A screenshot of a computer

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### Generate Reports for Parts

A screenshot of a computer

Description automatically generatedOn the Parts page, you can enter a keyword in the search bar, click 'Search' to display the results on the page, and then click 'PDF Report' to navigate to the PDF report page, where you can download or print the report.

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

# Unit Test Plan

## Introduction

### Purpose

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

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

## Test Plan

### 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 products list, parts list, and other information.
* Database Setup: A configured database with predefined data to replicate real-world scenarios.

### Features

The unit tests will cover the following features:

1. Product Management: Verifying the ability to view, find by ID, update, and delete products, ensuring accurate product management and data validation.
2. Part Management: Verifying the ability to view, find by ID, update, and delete parts, ensuring accurate part management and data validation.

### Deliverables

The Unit Test Plan will include 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

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 product management and part management.
3. Database Initialization: Initialize the database with predefined test data, including products list and parts list.
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

* 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 products list and parts list.

### Pass/Fail Criteria

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

* Product Management:
  + Pass: Products can be viewed, found by ID, updated, and deleted without errors. The data is correctly validated, and the products list is accurate.
  + Fail: Product management may encounter issues such as validation errors, data not being updated, or incorrect product details.
* Part Management:
  + Pass: Parts can be viewed, found by ID, and deleted without errors. The data is correctly validated, and the parts list is accurate.
  + Fail: Part management may encounter issues such as validation errors, data not being updated, or incorrect part details.

If a test fails, we will:

* + Debug and identify the cause of the failure.
  + Modify the source code to fix the issue.
  + Execute the test and analyze test results to verify that the problem is resolved.

## Specifications

The Unit Test Plan will include sample code that demonstrates the testing procedures and assertions. This code will be a part of the test documentation.

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## Procedures

* Product Management Testing Process:
* Test Product findAll (Iteration):
* The functionality of finding all the products was tested.
* An initial test was conducted to verify successfully finding of all the products.
* The test result was provided immediately after the test, indicating a "Pass."
* An iteration occurred when testing the finding of all products with invalid data.
* After multiple iterations, the test results were provided, indicating "Fail" for invalid product data.
* Test Product findById (Iteration):
* The functionality of finding the product by ID was tested.
* An initial test was conducted to verify successfully finding of the products by ID.
* The test result was provided immediately after the test, indicating a "Pass."
* An iteration occurred when testing the finding of the product by ID with invalid data.
* After multiple iterations, the test results were provided, indicating "Fail" for invalid product data.
* Test Save Product (Not Iteration):
* The functionality of saving a product was tested by adding a new product.
* An initial test was conducted to verify the successful addition of the product.
* The test result was provided immediately after the test, indicating a "Pass."
* Test Delete Product (Not Iteration):
* The functionality of deleting a product was tested by removing a product.
* An initial test was conducted to verify the successful deletion of the product.
* The test result was provided immediately after the test, indicating a "Pass."
* Part Management Testing Process:
* Test Part findAll (Iteration):
* The functionality of finding all the parts was tested.
* An initial test was conducted to verify successfully finding of all the parts.
* The test result was provided immediately after the test, indicating a "Pass."
* An iteration occurred when testing the finding of all parts with invalid data.
* After multiple iterations, the test results were provided, indicating "Fail" for invalid part data.
* Test Part findById (Iteration):
* The functionality of finding the part by ID was tested.
* An initial test was conducted to verify successfully finding of the part by ID.
* The test result was provided immediately after the test, indicating a "Pass."
* An iteration occurred when testing the finding of the part by ID with invalid data.
* After multiple iterations, the test results were provided, indicating "Fail" for invalid part data.
* Test Save Part (Not Iteration):
* The functionality of saving a part was tested by adding a new part.
* An initial test was conducted to verify the successful addition of the part.
* The test result was provided immediately after the test, indicating a "Pass."
* Test Delete Part (Note Iteration):
* The functionality of deleting a part was tested by removing a part.
* An initial test was conducted to verify the successful deletion of the part.
* The test result was provided immediately after the test, indicating a "Pass."

In summary, iterations were an important 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

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:

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Description automatically generated

* *Product findAll() Test*:
  + Purpose: This test ensures that all products can be found successfully.
  + Result: The test passed when all products were found successfully.
  + Pass/Fail Criteria: Pass
  + Remediation: No remediation required.
* *Product findById() Test*:
  + Purpose: This test verifies that product information can be successfully found by ID.
  + Result: The test passed when the product was successfully found by ID.
  + Pass/Fail Criteria: Pass
  + Remediation: No remediation required.
* *Product save() Test:*
  + Purpose: This test verifies that product information can be saved successfully.
  + Result: The test passed when a product was successfully saved.
  + Pass/Fail Criteria: Pass
  + Remediation: No remediation required.
* *Product deleteById() Test:* 
  + Purpose: This test ensures that products can be deleted successfully.
  + Result: The test passed when a product was successfully deleted.
  + Pass/Fail Criteria: Pass
  + Remediation: No remediation required.
* Part Management Test Results:

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* *Part findAll() Test*:
  + Purpose: This test ensures that all parts can be found successfully.
  + Result: The test passed when all parts were found successfully.
  + Pass/Fail Criteria: Pass
  + Remediation: No remediation required.
* *Part findById() Test*:
  + Purpose: This test verifies that part information can be successfully found by ID.
  + Result: The test passed when the part was successfully found by ID.
  + Pass/Fail Criteria: Pass
  + Remediation: No remediation required.
* *Part save() Test:*
  + Purpose: This test verifies that part information can be saved successfully.
  + Result: The test passed when a part was successfully saved.
  + Pass/Fail Criteria: Pass
  + Remediation: No remediation required.
* *Part deleteById() Test:* 
  + Purpose: This test ensures that parts can be deleted successfully.
  + Result: The test passed when a part was successfully deleted.
  + Pass/Fail Criteria: Pass
  + Remediation: No remediation required.

In summary, the unit tests for product management and part management 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.