**CIS 5690 Advanced Systems Project**

**Ecommerce Application**

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# System Description

This project's objective is to develop an ecommerce system online using advanced Java concepts, OOPS principles, spring frameworks, and front-end concepts and frameworks like Angular, HTML, CSS, and BootStrap that I learnt as a part of my master's program.

The end user can purchase the product online using this e-commerce platform. The system enables the user to look up a certain project using a keyword or category. The user can control the shopping basket as well as add products and remove products. The user has access to manage orders and view order invoices.

Using the Angular framework and technologies like HTML, CSS, bootstrap, and typescript as the programming language, the frontend for the e-commerce application is developed. And utilizing spring frameworks like spring Data Rest and springboot, the backend apis of the application were created in the java programming language. The Rest api is utilized for backend and frontend communication.



## Requirments Specifications

The functional and non-functional requirements are listed in the table below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ID | Use case | Actor | Type | Priority |
| 1 | Login | Customer | Functional | Must Have |
| 2 | Browse Products | Customer | Functional | Must Have |
| 3 | Search Product | Customer | Funcitional | Must Have |
| 4 | Add Products to cart | Customer | Functional | Must Have |
| 5 | Update/Delete products In the cart | Customer | Functional | Must Have |
| 6 | Checkout | Customer | Functional | Must Have |
| 7 | Payment | Customer | Functional | Must Have |
| 8 | View Order History | Customer | Functional | Must Have |
| 9 | View Invoice | Customer | Functional | Must Have |
| 10 | Cancel the Order | Customer | Functional | Must Have |
| 11 | Reset Password | Customer | Functional | Must Have |
| 12 | Logout | Customer | Functional | Must Have |

## Use Case Diagram



## Use Cases

Below are the breif discription of the for the use cases,

**Login**: The customer can login by enter name and password. The system verifies the name and password matches. If not matches, error messages shows to the customer.

**Browse Products**: The customer requests to view the product in product category. The system will display the information about product of selected category.

**Search Product:** The customers enter the search product parameters and request a search product. The system search through products category in database and gives information. If not matches, gives fail message.

**Add Products to cart:** When customer finds the product he wants, add to shopping carts. The systems stores and track the information about product.

**Update/Delete products In the cart:** When the customer wants to update quantity of the product or removes the products the system will update accordingly.

**Checkout**: After reviewing the cart the customer can hit the checkout button. The system navigates to payment page.

**Payment**: The customer should enter all the required details and will click the purchase button the system will validate the details and places the order and displays the invoice with order details.

**View Order History**: After logging on when the customer hits orders tap the system will display table with all the previous orders.

**View Invoice:** The system will display invoices of all the previous orders.

**Cancel the Order:** The system will checks the order status and will cancel the order and updates accordingly.

**Reset Password:** The system will reset the password and update on the server accordingly.

**Logout**: After clicking on logout the system will logout the user and resets the user session.

## Use Case Specfications

|  |
| --- |
| Use Case: Place Order |
| Use Case ID: 1 |
| Primary Actor: Customer |
| Secondary Actor: None |
| Preconditions: |
| Main flow:   1. The customer will browse or for the require products. 2. The customer will click on add to cart button and adds product to the cart. 3. After adding all the require products the customer will click on cart icon. 4. After clicking on cart icon, the system will navigate to cart items page. 5. The customer will review the cart items and clicks on checkout link. 6. The system will navigate to payments page. 7. The customer will enter the required details and click on purchase button. 8. The system will place the order and displays the invoice. |
| Post conditions: |

|  |
| --- |
| Use Case: Search Order |
| Use Case ID: 2 |
| Primary Actor: Customer |
| Secondary Actor: None |
| Preconditions: |
| Main flow:   1. The customer will select the require category from side menu bar. 2. The system will display the selected category. 3. The customer will enter the search term in search bar. 4. The customer will click the search button. 5. The system will display products according to the search criterion. |
| Post conditions:   1. The system will display products according to the search criterion. |

|  |
| --- |
| Use Case: View Orders |
| Use Case ID: 3 |
| Primary Actor: Customer |
| Secondary Actor: |
| Preconditions:  1. The customer should login into the application. |
| Main flow:   1. After login the customer will click on the orders tab. 2. The System will navigate to orders page. 3. If any previous orders,    1. The system will display the previous orders 4. If no previous orders   4.1 The system will display no order present error message. |
| Post conditions: |

|  |
| --- |
| Use Case: Cancel Order |
| Use Case ID: 4 |
| Primary Actor: Customer |
| Secondary Actor: |
| Preconditions:   1. Use Case ID: 3 2. The order status should be in processing |
| Main flow:   1. If the previous orders are present.    1. The customer clicks on the view order button.    2. The system will navigate to order details page.    3. Customer will click on cancel order button.    4. The system will display the success message. 2. If the orders are not present.   2.1 The system will display alert message |
| Post conditions:  The order invoice will be updated. |

|  |
| --- |
| Use Case: View Order |
| Use Case ID: 5 |
| Primary Actor: Customer |
| Secondary Actor: |
| Preconditions:   1. Use Case ID: 3 |
| Main flow:   1. If the previous orders are present.    1. The customer clicks on the view order button.    2. The system will navigate to order details page.    3. The system will display the order details. 2. If the orders are not present.   2.1 The system will display alert message |
| Post conditions: |

|  |
| --- |
| Use Case: View Invoice |
| Use Case ID: 6 |
| Primary Actor: Customer |
| Secondary Actor: |
| Preconditions:   1. Use Case ID: 5 |
| Main flow:   1. The system will display the Order details 2. Customer will click on the view invoice button. 3. The system will navigate to invoice page. 4. The system will display the order invoice. |
| Post conditions: |

|  |
| --- |
| Use Case: Place Order Error |
| Use Case ID: 7 |
| Primary Actor: Customer |
| Secondary Actor: None |
| Preconditions: |
| Main flow:   1. The customer will browse or for the require products. 2. The customer will click on add to cart button and adds product to the cart. 3. After adding all the require products the customer will click on cart icon. 4. After clicking on cart icon, the system will navigate to cart items page. 5. The customer will review the cart items and clicks on checkout link. 6. The system will navigate to payments page. 7. The customer will enter the required details and click on purchase button. 8. If the product quantity in cart is greater that product quantity in stock    1. System will display the error message 9. If the product quantity in cart is less that product quantity in stock   9.1 System will place the order and display the invoice. |
| Post conditions: |

## Activity Diagrams











# Design

## Class Diagrams

1. Class Diagram for Product and ProductCategory.



1. Class Diagram for Customer, Order, Address and OrderItem

## 

## Database Diagrams

1. Database Diagram for Product and ProductCategory and their relation.



1. Database Diagram for Customer, Order, Address and OrderItem and relation.



## Interaction Diagrams

Integration with okta for configuring signin widget

## 

## Tools Used

* Eclipse: For backend code development.
* Visual Studio code: For frontend code development.
* My SQL Server: Database server
* SQL workbench: creating database and performing data base opportunities.

## Application Screenshots

1. Main page:

A picture containing application

Description automatically generated

1. Login Page:

Graphical user interface, website

Description automatically generated

1. Shopping Cart:

Graphical user interface, website

Description automatically generated

1. Checkout:

Graphical user interface, website

Description automatically generated

1. Invoice:

Graphical user interface, text, website

Description automatically generated

1. Orders

Table

Description automatically generated

1. View Order and Cancel Order

Graphical user interface

Description automatically generated with medium confidence

# Technologies Used

|  |  |
| --- | --- |
| Technology | Version |
| Springboot | 2.7.4 |
| Angular | 14.2.6 |
| node | 16.10.0 |
| Typescript | 4.9.3 |
| Bootstrap | 5.2.0 |
| Okta-signin-widget | 6.2.0 |

# Appendices

Appendix A : Actors

Appendis B : Other Terms

## Appendix A : Actors

|  |  |
| --- | --- |
| **Actor Name** | **Function** |
| Customer | End User how use the application for shopping. |
| Admin | Person who manages backend inventory |

## Appendis B : Other Terms

|  |  |
| --- | --- |
| **Term** | **Meaning** |
| Invoice | Document that holds the order details and price. |
| Orders | List of orders placed previously. |