KLE Society's

KLE Technological University

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Structured Enquiry Assessment Report

On

E-Commerce Platform

Object Oriented Programming (20ECSC204)
Object Oriented Programming Lab (20ECSP203)

Submitted by

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1.Introduction

1.1 Overview of the problem statement

This is an e-commerce platform in C++ where users can browse products, add items to their shopping carts, and place orders. How would you design classes to represent products, shopping carts, and orders, and implement methods for managing the shopping experience and processing orders

1.2 Features of Application

- **Product Management:**

  - Represents a product with attributes such as ID, name, price, and stock.

  - Manages a catalog of products and provides functionalities to add products and browse existing product.

- **Shopping Cart:**

  - Time and date display.
  - Weather information retrieval.
  - Basic math operations.
  - Opening and closing applications.

- **Order Management:**

  - Represents an order consisting of multiple products with quantities and the total order amount.
  - Represents an order with a unique ID, list of ordered items (`orderItems`), and total amount
  - Manages order history and provides functionalities to place orders and view order history

- **User Authentication and Management:**

  - Represents a user with a username and password.
  - Represents a manager who can perform administrative tasks.
  - Represents a customer who can browse products, add items to the cart, place orders, etc.
  - Allows users (managers and customers) to log in, perform actions based on their roles, and log out

- **Error Handling**:

  - Handles invalid user inputs gracefully throughout the menu options.
  - Throws exceptions with meaningful error messages (e.g., invalid credentials, insufficient stock, product not found) and catches them for user feedback.
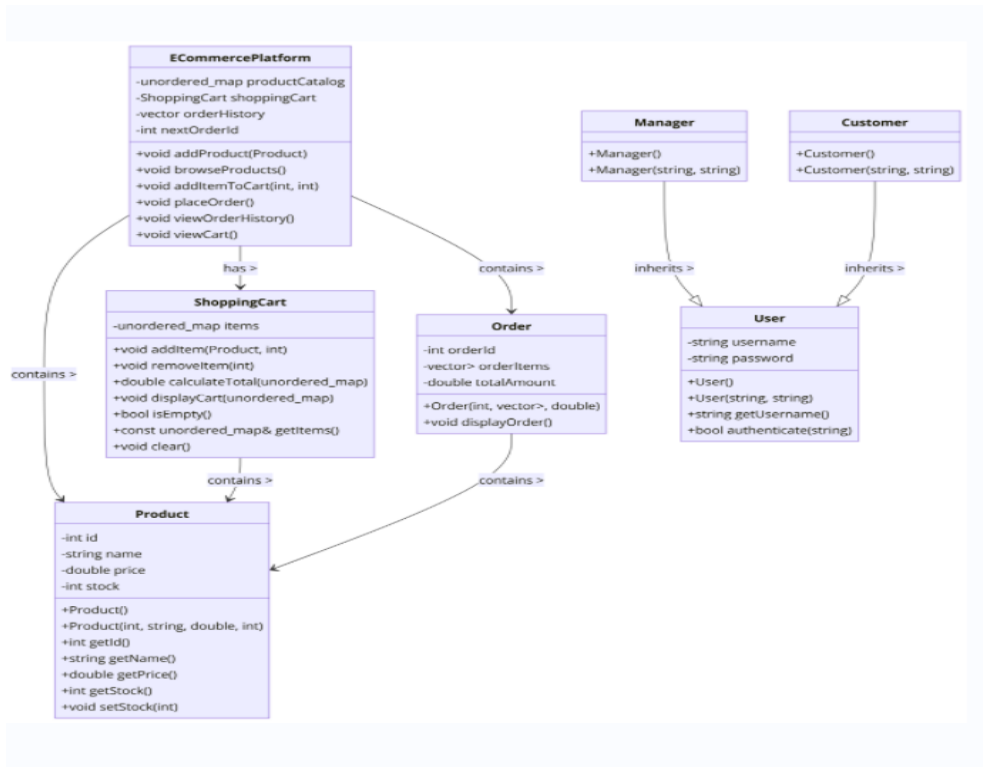
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- **User Experience**:

  - Provides clear and informative messages throughout user interactions (e.g., successful login, product added to cart,order placed).Ensuring responses are clear, informative, and engaging.
  - Ensures responses are user-friendly, guiding users through available actions and providing feedback on operations.
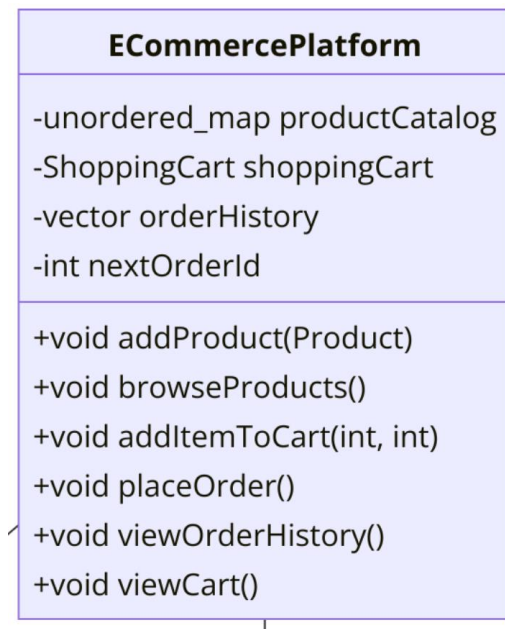
- **Security**:

  - Implements basic user authentication with username and password credentials.
  - Ensures secure access by verifying user credentials against stored data before granting access to platform functionalities.

Design

2.1   Class Diagrams

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Class Diagram explanation:

ECommercePlatform
-unordered_map productCatalog -ShoppingCart shoppingCart -vector orderHistory -int nextOrderId
+void addProduct(Product) +void browseProducts() +void addItemToCart(int, int) +void placeOrder() +void viewOrderHistory() +void viewCart()

- **Functionality**: It facilitates online product browsing, cart management, and secure order processing.

  - The above class is used to Adding Items,Placing Orders,Viewing Orders.

ShoppingCart
-unordered_map items
+void addItem(Product, int) +void removeItem(int) +double calculateTotal(unordered_map) +void displayCart(unordered_map) +bool isEmpty() +const unordered_map& getItems() +void clear()
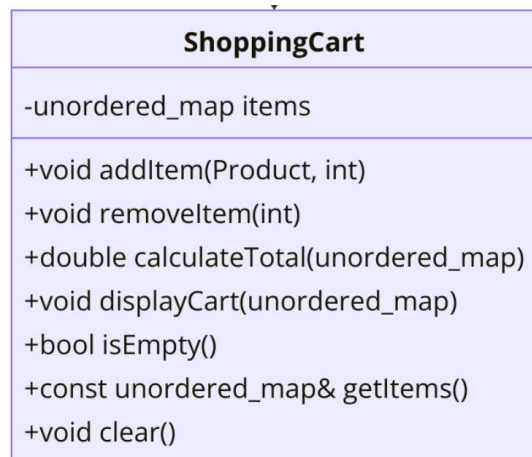
- The above class is used to add the items,remove the items,calculate the total amount,

  Display the cart items,and check wheater the cart is empty.

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```
                    ⅴ
      ┌─────────────────────────┐
      │          Order          │
      ├─────────────────────────┤
      │ -int orderId            │
      │ -vector> orderItems     │
      │ -double totalAmount     │
      ├─────────────────────────┤
      │ +Order(int, vector>, double) │
      │ +void displayOrder()    │
      └─────────────────────────┘
```
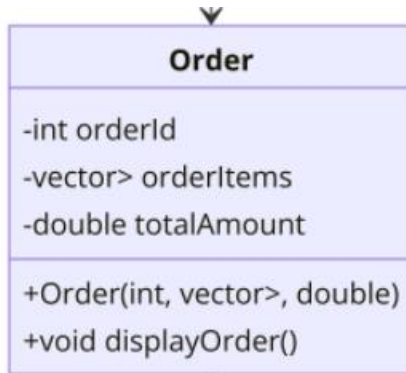
• The above class is used to get the unique orderId and stores a list of items in the order and contains information about a specific product in the order, such as the product ID, quantity, and price and stores the total amount of the order

```
      ┌─────────────────────────────────┐
      │            Product              │
      ├─────────────────────────────────┤
      │ -int id                         │
      │ -string name                    │
      │ -double price                   │
      │ -int stock                      │
      ├─────────────────────────────────┤
      │ +Product()                      │
      │ +Product(int, string, double, int) │
      │ +int getId()                    │
      │ +string getName()               │
      │ +double getPrice()              │
      │ +int getStock()                 │
      │ +void setStock(int)             │
      └─────────────────────────────────┘
```
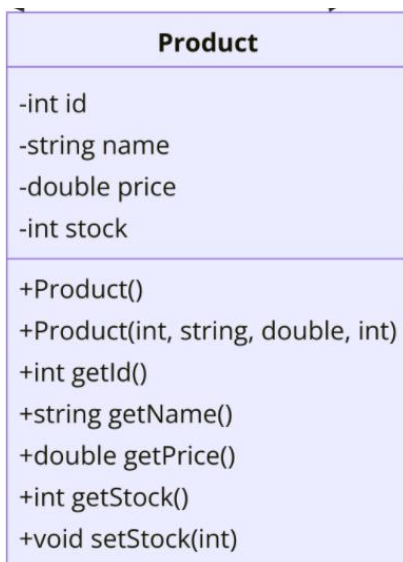
- Functionality : This class defines a product class to store information about products in an e-commerce platform.
- The above class has a unique product ID ,name of the product and stores the price of the product and store the number of units of the product in stock.

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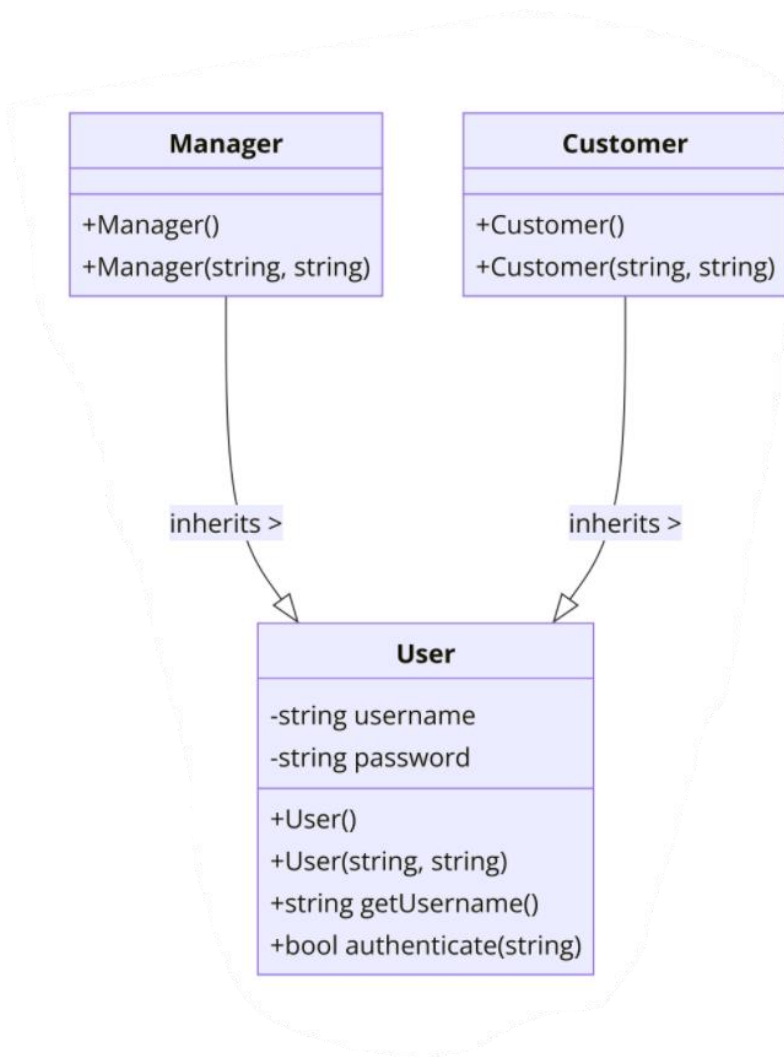
- In the above classes the uses inheritance and has a user name and password for both the manager and the customer

ECommercePlatform application exemplifies aspects of the Facade design pattern by providing a simplified and unified interface (**main** function) that hides the complexities of the underlying subsystems (user management, product catalog, shopping cart, order processing). This design promotes ease of use, separation of concerns, and robust error handling, aligning with the principles of encapsulation and abstraction central to the Facade pattern. Thus, enhancing maintainability and scalability of the application in handling e-commerce operations.

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Output:

```
------------------------------------------------------------
|                                                          |
|                        FASH-HUB                          |
|                                                          |
------------------------------------------------------------
Login as:
1. Manager
2. Customer
Enter your choice: 1
Enter username: admin
Enter password: admin123
Manager login successful.

E-Commerce Platform Menu:
------------------------------------------------------------
|                                                          |
|                        FASH-HUB                          |
|                                                          |
------------------------------------------------------------
1. Add Product
2. Browse Products
3. View Order History
4. Logout
Enter your choice: 1
Enter Product ID: 3
Enter Product Name: sunglass
Enter Product Price: 500
Enter Product Stock: 56
Product added successfully.
```

```
|                        FASH-HUB                          |
|                                                          |
------------------------------------------------------------
1. Add Product
2. Browse Products
3. View Order History
4. Logout
Enter your choice: 2
Product ID: 3, Name: sunglass, Price: 500, Stock: 56
Product ID: 1, Name: Biscuit, Price: 10, Stock: 40
Product ID: 2, Name: Battery, Price: 50, Stock: 80

E-Commerce Platform Menu:
------------------------------------------------------------
|                                                          |
|                        FASH-HUB                          |
|                                                          |
------------------------------------------------------------
1. Add Product
2. Browse Products
3. View Order History
4. Logout
Enter your choice: 3
Order ID: 1
Product: Battery, Quantity: 20, Subtotal: 1000
Product: Biscuit, Quantity: 10, Subtotal: 100
Total Amount: 1100
```

<Title of the OE>

```
----------------------------------------------------------
Login as:
1. Manager
2. Customer
Enter your choice: 2
Enter username: user
Enter password: user123
Customer login successful.

E-Commerce Platform Menu:
----------------------------------------------------------
|                                                        |
|                     FASH-HUB                           |
|                                                        |
----------------------------------------------------------
1. Browse Products
2. Add Item to Cart
3. View Cart
4. Place Order
5. View Order History
6. Logout
Enter your choice: 1
Product ID: 3, Name: sunglass, Price: 500, Stock: 56
Product ID: 1, Name: Biscuit, Price: 10, Stock: 40
Product ID: 2, Name: Battery, Price: 50, Stock: 80
```

```
----------------------------------------------------------
1. Browse Products
2. Add Item to Cart
3. View Cart
4. Place Order
5. View Order History
6. Logout
Enter your choice: 2
Enter Product ID to add to cart: 3
Enter Quantity: 2
Added 2 of sunglass to the cart.

E-Commerce Platform Menu:
----------------------------------------------------------
|                                                        |
|                     FASH-HUB                           |
|                                                        |
----------------------------------------------------------
1. Browse Products
2. Add Item to Cart
3. View Cart
4. Place Order
5. View Order History
6. Logout
Enter your choice: 3
Product: sunglass, Quantity: 2, Total: 1000
```

<Title of the OE>

```
E-Commerce Platform Menu:
---------------------------------------------------------------
|                                                             |
|                         FASH-HUB                            |
|                                                             |
---------------------------------------------------------------
1. Browse Products
2. Add Item to Cart
3. View Cart
4. Place Order
5. View Order History
6. Logout
Enter your choice: 4
Order ID: 2
Product: sunglass, Quantity: 2, Subtotal: 1000
Total Amount: 1000
```

```
E-Commerce Platform Menu:
---------------------------------------------------------------
|                                                             |
|                         FASH-HUB                            |
|                                                             |
---------------------------------------------------------------
1. Browse Products
2. Add Item to Cart
3. View Cart
4. Place Order
5. View Order History
6. Logout
Enter your choice: 5
Order ID: 1
Product: Battery, Quantity: 20, Subtotal: 1000
Product: Biscuit, Quantity: 10, Subtotal: 100
Total Amount: 1100
Order ID: 2
Product: sunglass, Quantity: 2, Subtotal: 1000
Total Amount: 1000
```