

**DEPARTMENT OF COMPUTER & INFORMATION SYSTEMS ENGINEERING**  
**BACHELORS IN COMPUTER SYSTEMS ENGINEERING**

**Course Code: CS-116**

**Course Title: Object Oriented Programming**

**Complex Engineering Problem**

**FE Batch 2023, Spring Semester 2024**

**Grading Rubric**

**TERM PROJECT**

**Group Members:**

Student No.	Name	Roll No.
S1	Aaima Khan	CS-23079
S2	Haniya Khan	CS-23073
S3	Dua Siddiqui	CS-23122

CRITERIA AND SCALES					Marks Obtained		
					S1	S2	S3
Criterion 1: Does the class diagram meet the desired specifications and produce the desired outputs? (CPA-1, CPA-3) [4 marks]							
1	2	3	4				
The class diagram does not meet the desired specifications and is producing incorrect outputs.	The class diagram partially meets the desired specifications and is producing incorrect or partially correct outputs.	The class diagram meets the desired specifications but is producing incorrect or partially correct outputs.	The class diagram meets all the desired specifications and is producing correct outputs.				
Criterion 2: Does the application meet the desired specifications and produce the desired outputs? (CPA-1, CPA-3) [6 marks]							
1	2	3	4				
The application does not meet the desired specifications and is producing incorrect outputs.	The application partially meets the desired specifications and is producing incorrect or partially correct outputs.	The application meets the desired specifications but is producing incorrect or partially correct outputs.	The application meets all the desired specifications and is producing correct outputs.				
Criterion 3: How well is the code organization? [2 marks]							
1	2	3	4				
The code is poorly organized and very difficult to read.	The code is readable only to someone who knows what it is supposed to be doing.	Some part of the code is well organized, while some part is difficult to follow.	The code is well organized and very easy to follow.				
Criterion 4: How friendly is the application interface? (CPA-1, CPA-3) [2 marks]							
1	2	3	4				
The application interface is difficult to understand and use.	The application interface is easy to understand and but not that comfortable to use.	The application interface is very easy to understand and use.	The application interface is very interesting/ innovative and easy to understand and use.				
Criterion 5: How does the student performed individually and as a team member? (CPA-2, CPA-3) [4 marks]							
1	2	3	4				
The student did not work on the assigned task.	The student worked on the assigned task, and accomplished goals partially.	The student worked on the assigned task, and accomplished goals satisfactorily.	The student worked on the assigned task, and accomplished goals beyond expectations.				
Criterion 6: Does the report adhere to the given format and requirements? [2 marks]							
1	2	3	4				
The report does not contain the required information and is formatted poorly.	The report contains the required information only partially but is formatted well.	The report contains all the required information but is formatted poorly.	The report contains all the required information and completely adheres to the given format.				
Total Marks:							

\_\_\_\_\_  
Teacher's Signature

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## 1. PROBLEM DESCRIPTION

### Term Project Title:

### ONLINE SHOPPING CART

### Description:

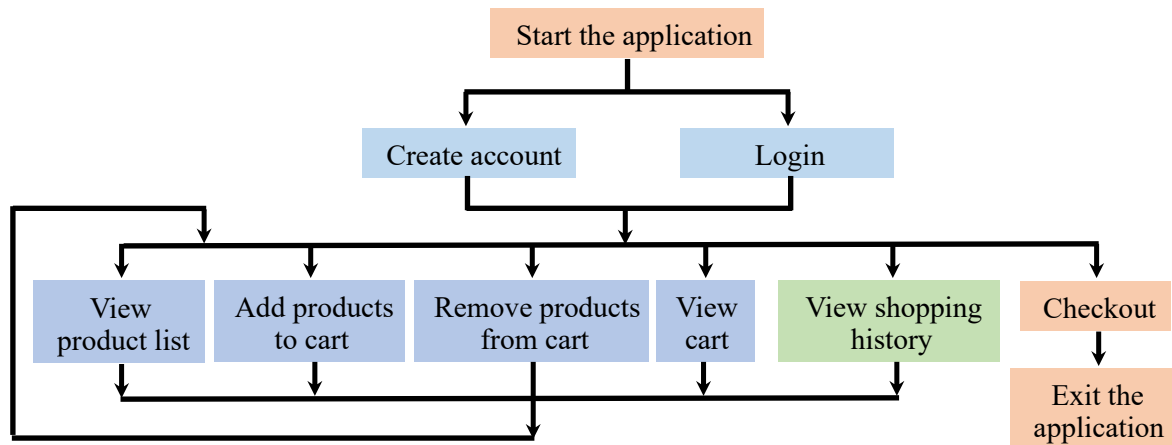
Online shopping cart is a virtual shopping trolley, where shoppers can put all of their want-to-buy products in, review to make adjustments in quantity, product attributes, etc., and remove it before or during the checkout if they change their mind. The application also allows the users to view history of their past purchases.

### Minimum Required Features:

Your application should have the following features.

1. Store and display a product list with price and other relevant information. Use fixed products; there should be at least 10 products for the user to choose from.
2. Allow user to create an account with some basic information like username, password, first and last names, address, etc.
3. Allow account holder to login to the respective account and add to cart as many products as needed from the available list of products.
4. When user checks out, the items of the cart are transferred to his/her shopping history. For simplicity payment process is omitted.
5. Maintain shopping history for each user with date, items purchased, total bill and other relevant information.
6. Each account holder should be able to
  - view the list of products and their relevant information from the virtual shopping shelves
  - add products to the cart
  - remove products from the cart
  - view the cart with product names, prices, quantities, total price, etc.
  - checkout
  - view shopping history

The following flow diagram depicts the overall working of the application:



### Design Hints:

1. Finalize the user interface for your application.
2. Choose attributes and methods for each class.
3. Choose data structures/objects to keep and organize the information when your application is running.
4. Decide on information that needs to be stored in files. Products information, account holders information and shopping history for each account holder shall be maintained and stored in files.
5. Divide the code into modules and functions for easy distribution of tasks among the group member.

### Some Extension Ideas:

- Make products and their quantities variable. Provide administrator account as well to add/remove products and adjust their quantities. Can add stock information too (item out of stock, etc.).
- Allow user to save carts for later access without checking out.
- Allow user to display shopping history for a specific date or item.
- Include some dummy payment process, asking for credit card information, address confirmation, feedback on products and service, etc.
- Use GUI to improve interface and/or display products.
- Make web interface for the application.

## 2. DISTINGUISHING FEATURES OF OUR PROJECT

### CLASSES:

- Choice: Handles the initial user choices for signup, login, or manager login.
- Sign up: Manages user registration by collecting and validating credentials.
- Login: Manages user login by validating user credentials against stored data.
- AbstractProduct: An abstract base class that defines a general product with attributes name, price, and quantity and requires subclasses to implement a method for calculating discount.
- Product: Represents a product with attributes like name, price, and discount, and methods for price calculations.
- Manager: Provides functionalities for adding, editing and removing products in the inventory.
- ProductManager: Manages the inventory of products including loading from and saving to a file.
- Cart: Manages items added to the user's shopping cart including adding, removing, and displaying items.
- History: Tracks and manages the user's purchase history, logging completed transactions.
- WishList: Manages items added to the user's wishlist including adding, removing, and displaying items.
- Main: Handles the main user interface and menu options after login including shopping and managing the cart and wishlist.

### LIBRARIES:

- datetime: The datetime library provides classes for manipulating dates and times in a more object-oriented manner.
- os: The os library in Python provides a way of using operating system-dependent functionality like reading or writing to the file system.
- abc: abc is a library in Python. It stands for "Abstract Base Classes" and provides mechanisms for defining abstract base classes in Python.

### EXTENSION IDEAS IMPLEMENTED:

In our project, we have enhanced the system with several new features that includes the following

- Manager Account: We have implemented a dedicated manager account functionality. This allows the manager to manage products effectively, including adding, removing, and updating product and its quantity. Managers can log in with a secure username and password.

- Wishlist: A wishlist feature has been added, allowing users to save products they are interested in for future reference.
- Dummy Payment System: To simulate the complete shopping experience, we have integrated a dummy payment system. This allows users to go through the checkout process, providing a realistic view of the transaction flow.

These extensions collectively enhance the functionality and user experience of our project, making it more robust and user-friendly.

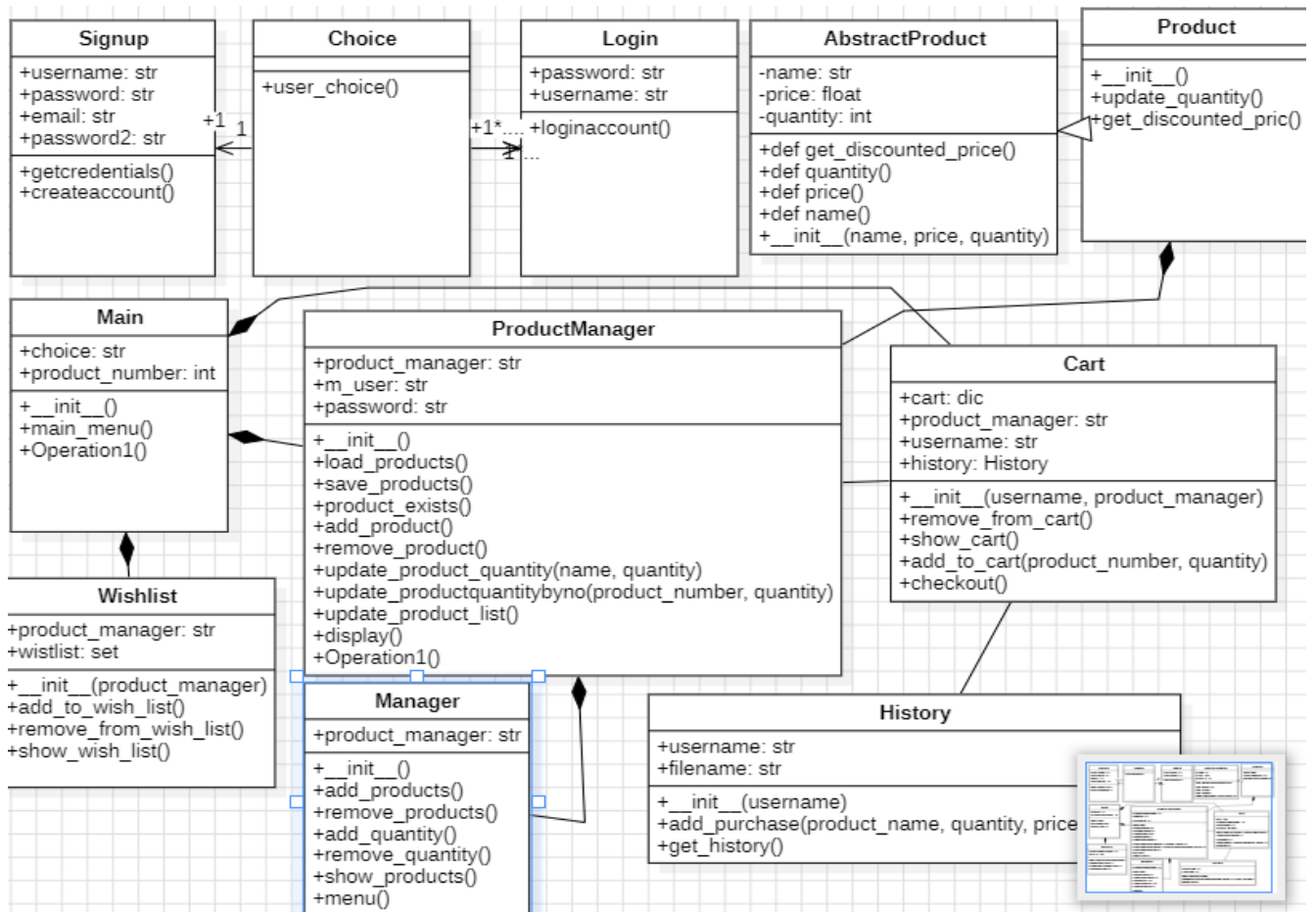
### **3.FLOW OF PROJECT/CLASS DIAGRAM**

#### WELCOME TO CAKE & BAKE

1. Start Program: The program begins by displaying a main menu to the user.
2. Display Main Menu: The user can choose to sign up, log in, or access manager functionalities.
  - Signup: The user enters credentials, which are validated and used to create a new account.
  - Login: The user enters credentials, which are validated to log them into their account.
  - Manager Login: The manager logs in to access special functionalities.
3. Post Login: Once logged in, the user or manager is presented with different options.
  - User Menu:
    - The user can view a list of products.
    - The user can add products to their shopping cart.
    - The user can remove products from their cart.
    - The user can view their cart.
    - The user can add products to their wish list.
    - The user can remove products from their wish list.
    - The user can view their wish list.
    - The user can proceed to checkout.
    - The user can view their shopping history.
  - Manager Menu:
    - The manager can add new products to the inventory.

- The manager can edit details of existing products.
- The manager can remove products from the inventory.

4. End Program: The program ends when the user or manager chooses to exit.



#### 4. MOST CHALLENGING PART WHILE WORKING ON THE PROJECT

We faced the most difficulty when we had to implement functionality to save the shopping history for every user in a separate file. Moreover, in handling some un-ambiguous bugs. We also encountered challenges in updating the product list file when users removed or added products.

## 5. ANYTHING NEW LEARNT IN PYTHON

We learnt so many new things, also explored some built in libraries of python.

- The functionalities of standard libraries such as time, datetime.
- We can use some external libraries of python to give our project a new look.
- Discovered ways to handle exceptions to make our application run smoothly.
- Throughout the development of the "Cake&Bake", we learned the importance of integrating different parts of the code to ensure a functional, and user-friendly application.

## 6. INDIVIDUAL CONTRIBUTION OF EACH GROUP MEMBER

### HANIYA KHAN CS-23073

- She made the main interface for the application.
- Implemented functionality to login or signup for the user, saved every user's information in the separate files, also implemented some part of the manager class.
- Kept the database maintained of all the users sign up or logging in to the application.
- She worked on most part of the report mainly including the class diagram, etc.
- Handle many bugs.

### AAIMA KHAN CS-23079

- She worked on the most important part of the project where users can add or remove items in their cart.
- Maintained the product list in *PRODUCT* class
- She also worked on the product list, displayed it to users, and updated the file after making changes.
- Implement extra functionality for *WISHLIST* class and *MANAGER* class.

### DUA SIDDIQUI CS-23122

- She worked on class *CART* where user can checkout of the cart along with payment methods.
- She worked on class *HISTORY* where every user can access their maintained overall history of shopping as well as their personal information in a separate file.
- She also worked on some part of report.
- She implemented the logic for *DUMMY PAYMENT* process.
- She created an additional implementation of a separate text file that saves checkout history of every user that buys a product.



## 7. FUTURE EXPANSIONS

- **WEB INTERFACE:** We can give Online Shopping Cart a web interface using frame work such as flask or Django.
- **DATABASE INTEGRATION:** Use a database (e.g. MySQL,SQLite etc).
- **USER AUTHENTICATION AND SECURITY:** Implement session management to keep users logged in and handle authentication tokens.
- **EMAIL NOTIFICATIONS:** Send email notifications for events like successful registration, password changes, and login alerts.

## 8. TEST CASE RUNS

```
C:\WINDOWS\py.exe
WELCOME TO CAKE&BAKE
1:SIGNUP: press 1
2.LOGIN: press 2
3.MANAGAER LOGIN: press 3
Enter your choice: 1
Enter your username (should be 6 or more characters): Charlie
Enter your password: 12345
Confirm password: 12345
Enter your email: Charlie1@gmail.com
YOU HAVE SUCCESSFULLY CREATED YOUR ACCOUNT

1. Display Products
2. Add to Cart
3. Remove from Cart
4. Show Cart
5. Add to Wish List
6. Remove from Wish List
7. View Wish List
8. Checkout
9. Show Purchase History
10. Exit
Enter your choice: 1
1. Chocolate Cake - $1499.0 - Quantity: 60
2. Fudge Cake - $1699.0 - Quantity: 100
3. Chocolate Biscuits - $399.0 - Quantity: 300
4. Forest Cake - $1699.0 - Quantity: 99
5. Heaven Cake - $2800.0 - Quantity: 91
6. Dairy Milk Cake - $2500.0 - Quantity: 100
7. Coffee Cake - $2999.0 - Quantity: 42
8. Rocher Cake - $3299.0 - Quantity: 27
9. Fruit Cake - $499.0 - Quantity: 5
10. Marble Cake - $499.0 - Quantity: 37

1. Display Products
2. Add to Cart
3. Remove from Cart
4. Show Cart
5. Add to Wish List
6. Remove from Wish List
7. View Wish List
8. Checkout
9. Show Purchase History
10. Exit
Enter your choice: 2
```

```

C:\WINDOWS\py.exe
1. Chocolate Cake - $1499.0 - Quantity: 60
2. Fudge Cake - $1699.0 - Quantity: 100
3. Chocolate Biscuits - $399.0 - Quantity: 300
4. Forest Cake - $1699.0 - Quantity: 99
5. Heaven Cake - $2800.0 - Quantity: 91
6. Dairy Milk Cake - $2500.0 - Quantity: 100
7. Coffee Cake - $2999.0 - Quantity: 42
8. Rocher Cake - $3299.0 - Quantity: 27
9. Fruit Cake - $499.0 - Quantity: 5
10. Marble Cake - $499.0 - Quantity: 37
Enter the product number to add to cart: 1
Enter the quantity: 20
Original Price: Rs1499.0, Discounted Price: Rs1199.2
Added 20 Chocolate Cake(s) to the cart.

Your Shopping Cart:
1. Chocolate Cake - 20 units - Rs23984.0
Total Bill : Rs23984.0

1. Display Products
2. Add to Cart
3. Remove from Cart
4. Show Cart
5. Add to Wish List
6. Remove from Wish List
7. View Wish List
8. Checkout
9. Show Purchase History
10. Exit
Enter your choice: 8
Are you sure you want to checkout? (yes/no): yes
Would you like to pay through COD or Debit Card? (COD/Debit Card): debit card
Enter your debit card number (6 digits): 098567
Payment successful. Your order has been placed and will be delivered soon.
Checkout complete. Your cart is now empty.

1. Display Products
2. Add to Cart
3. Remove from Cart
4. Show Cart
5. Add to Wish List
6. Remove from Wish List
7. View Wish List
8. Checkout

```

```

C:\WINDOWS\py.exe
9. Show Purchase History
10. Exit
Enter your choice: 9
YOUR PURCHASE HISTORY

Checkout Details:


Checkout Date: 2024-07-07 23:16:42
Purchased Items:
Chocolate Cake: 20 units - Rs1199.2 each
Total Bill: Rs23984.0
-----

1. Display Products
2. Add to Cart
3. Remove from Cart
4. Show Cart
5. Add to Wish List
6. Remove from Wish List
7. View Wish List
8. Checkout
9. Show Purchase History
10. Exit
Enter your choice: 10
Do you want to perform another operation? (yes/no): yes
WELCOME TO CAKE&BAKE

1.SIGNUP: press 1
2.LOGIN: press 2
3.MANAGAER LOGIN: press 3
Enter your choice: 2
Enter your username: Charlie
Enter your password: 12345
login successful

1. Display Products
2. Add to Cart
3. Remove from Cart
4. Show Cart
5. Add to Wish List
6. Remove from Wish List
7. View Wish List
8. Checkout
9. Show Purchase History

```

 charlie\_info - Notepad

File Edit Format View Help

Username: charlie

Password: 12345

Email: Charlie1@gmail.com

Cart History:

Product name: Chocolate Cake, Quantity: 20, Price: 1199.2, Total Bill: Rs23984.0

Checkout Details:

Checkout Date: 2024-07-07 23:16:42

Purchased Items:

Chocolate Cake: 20 units - Rs1199.2 each

Total Bill: Rs23984.0

-----

Account login date : 2024-07-07

Account login time : 23:17:14.417992

 charlie\_checkout - Notepad

File Edit Format View Help

|

Checkout Details:

Checkout Date: 2024-07-07 23:16:42

Purchased Items:

Chocolate Cake: 20 units - Rs1199.2 each

Total Bill: Rs23984.0