National University of Computer and Emerging Sciences

Fast School of Computing
Spring 2023
CS-1004 OOP (CS-Z)
Final Project

Special Instructions:

Read the complete problem and design a Class diagram with relationships for your convenience before starting coding, otherwise, you will get stuck in implementation.

a. Use proper and meaningful names for Data members and methods of the classes.
b. Polymorphism, Inheritance, Abstraction and Encapsulation concepts must be implemented in the system, identify and implement it yourself.
c. Carefully understand the problem before creating relationships between classes.
d. Carefully handle the memory i.e. free up the dynamically allocated memory when needed.
e. Create Constructors, Destructors; and Getter Setters where required.

About Project:

Shopping Portal

You need to develop a Shopping Portal. A portal is software used by retail stores to sell their products, keep track of all sales, products inventory, customers records, and invoicing.

Some main features of the portal are: -

- Shopping for customers
- Inventory management
- Customer management
- Sales record (daily, weekly, monthly, yearly)
- Purchase order management
- Invoicing (selling and purchasing)

The main actors for the system are customers, administrators, store managers, and vendors. The portal has three components; inventory management component, administration component, and shopping component.

The aim of this project is to manage the details of Cart, products, Inventory, orders, customers. The project is built at administrative end and thus the admin is guaranteed the access. The goal of this project is to reduce the manual work for managing cart, products, payments, category. It will track all the details of major tasks.

Firstly, a menu will be displayed to the customer. After the selection, all the products with their prices will be displayed. Then the customer will select the products and chooses the quantity (number of products). This process continues until the shopping is completed. Whenever the customer completes his shopping, the items, quantity, cost, and finally the total amount to be paid are displayed. A menu will be displayed to Admin. He can add, update, delete and view the products/items. Admin can also view all the orders placed by each customer at which time in a clear format. Vendor will also be able to register and login to system through valid credentials. Vendor will see the product request made by admin. He can accept or reject the request based on the availability of items. On acceptance, he provides the asked items and updated the inventory else send a response that we are short of items being asked.

Inventory Management

A portal allows keeping track of available stock of all items. This includes records of available quantities and sold quantities of each item. The data entry worker is responsible for updating inventory. When an item is added/updated into the inventory it has a specific code (SKU), sale_price, purchase_price , stock quantity, category, and department. *For example, Olpers will have SKU = 091312, sale_price = 145, purchase_price = 12.5, stock_quantity = 1000, category = dairy, department = food.* Whenever the items are deleted and new stock arrives, the quantity is updated in the inventory. The data entry worker can also see details of any item by entering the SKU into the system, modifying its details, and creating, updating, delete items from inventory. When an item is sold and a bill is generated, the respective item stock quantity is deducted by the quantity of that item purchased.

Invoicing: Selling, Purchasing

One of the main functions of the portal is to record transactions that the store made. These transactions are recorded using invoices. An invoice can be a sale invoice i.e when a customer buys something, or a purchase invoice i.e when the store purchases stock from any vendor. Purchasing can only be made by the manager of the store.
An invoice contains the following parts: -

- invoice id
- items name
- **item details (use array of object for items)**
- quantity of items
- subtotal of each item with respect to quantity purchased
- total amount of all items purchased

It is important that in the case of a sale invoice the amount is added to the cash register, and when a purchase invoice is made, the amount is deducted from the cash register.

The purchase invoice is of two types; credit invoice and cash invoice. If the purchase invoice is of credit type, then the amount needs not be deducted from the cash register. Such an amount will only be deducted when the manager manually updates the payment made to the respective vendor.

Shopping

A customer can purchase **items** of his/her liking. For this purpose, the main menu displays the top ten selling items list along with options to search for an item via its name, category, or department. If a customer wants to buy any item, he/she will add it to his/her cart.

When the customer has purchased all items (**use array of objects to store the purchased items**), the customer can proceed to check out. At checkout, the customer must be logged. For sign-up, the customer must provide his/her complete details at sign-up (name, email, phone number, address, * card no).   *optional*

At checkout, if the customer was not already logged in, then his/her cart must remain intact, and all the items in the cart must be maintained after login. At checkout, the customer will be shown a list of all items in the cart, items respective quantities, and the total amount. If the customer proceeds to finalize the order, he/she will have the option to pay via card or go for cash on delivery (COD).

If the customer opts for card payment, he/she will need to provide the pin code of his card, and once the transaction is successfully made, a bill shall be generated. And if the customer opts for COD, the bill will only be generated when the items have been delivered and payment made.
Once the order is completed from the customer end, the order must be packaged and shipped to the delivery address.

Administration

The admin of the portal can add, update, and delete users (customers and employees). Each user must have login credentials. The admin can add, update, and delete products, product categories, and departments. The admin also has all the inventory management options available. Retrieve all the previous customers and employees from file to update.
The admin and the store manager have the options to view sale and purchase reports, based on daily, weekly, monthly, and yearly time frames.
The sale report must display

- total items sold
- total quantity of each item sold
- total sale amount of each item
- total revenue collected
- total cost of all items sold
- total profit of all sales

The purchase report must display

- total items purchased
- cost of each item
- total cost of all items
- net total

All the reports must be stored and retrieved from the file and stored in parallel arrays.

Build the Shopping Cart systems with the following specifications.

1. System must be able to manage roles such as admin, customers, managers, inventory manager, vendors.
2. Ensure the registration and login for all the roles.
3. Customer will be able to purchase various items from different categories such as laptops, Mobile, Computer Courses, house hold items, clothes, Jewelry etc., from the given menu.
4. All the users will be able search the items, customers, orders based on their names, categories according to the access permitted per roles
5. Admin will be able to add items into the system.
6. Admin will be able to reduce the quantity or delete the item.
7. Admin will be able to print the bill along with system generated date, quantity and should update the inventory after items removed from the inventory.
8. Customer will be able to add items into his/her cart. An auto generate token for each customer order will be generated.
9. Customer will be able to remove any item from his/her cart.
10. Customer will be able to display the total price of all items present in your cart.
11. There will be a kind of premium customers who will get 10% discount on the products. (criteria Frequent users)
12. Display the reports of orders made by each user with system generated time.
13. Admin will be able to see all the orders are dispatched to the customer
14. Customer can see the status of their products.
15. Admin can view the total items available in inventory by applying the filters like category.
16. Vendor provide the items requested by admin and update the inventory.

Note: Some can be function stubs (empty functions) initially, to be completed in later steps.

- AddItem()
  - Adds an item to cartItems
- RemoveItem()
  - Removes item from cartItems vector. If item name cannot be found, output this message: Item not found in cart. Nothing removed.
- ModifyItem()
  - Modifies an item's description, price, and/or quantity. If item can be found (by name) in cart, check if parameter has default values for description, price, and quantity. If not, modify item in cart.
  - If item cannot be found (by name) in cart, output this message: Item not found in cart. Nothing modified.
- GetNumItemsInCart()
  - Returns quantity of all items in cart.
- GetCostOfCart()
  - Determines and returns the total cost of items in cart.

- PrintTotal()
  - Outputs total of objects in cart.
  - If cart is empty, output this message: SHOPPING CART IS EMPTY
- PrintItemDescriptions()
  - Outputs each item's description.
- PrintMenu()
  - PrintMenu() has a ShoppingCart parameter, and outputs a menu of options to manipulate the shopping cart. Each option is represented by a single character. Build and output the menu within the function. If the an invalid character is entered, continue to prompt for a valid choice. *Hint: Implement Quit before implementing other options.* Call PrintMenu() in the main() function. Continue to execute the menu until the user enters q to Quit.
- EnterNewCustomer

Screenshots of working:

```
Welcome to FAST shopping center!!!
What is your Login Type?
Please Select your role:
1. Customer
2. Admin
3. Vendor
```

```
Welcome to Customer Mode!!!
Are you a registered user of this application?
Do you want to login?
Please enter your username:
Please enter password:


                    CUSTOMER VIEW
=========================================================
What do u want to do ?
1.if u want to place order press 1
2.if u want to add item to cart press 2
3.if u want to display cart items press 3
4.if u want to search item press 4
5.if u want to remove item  press 5
6.if u want to see the total price press 6
7.if u want to exit press 0
```

```
                                              Ω My Cart : 0
                    <<<<- Home Page ->>>>

» Product Category
        [1] Fish & Meat
        [2] Frozen Food
        [3] Liquor & Tobacco
        [4] Bakery
        [5] Baby & Toddler
        [6] Fresh Produce
        [7] Groceries
        [8] Household & Homecare
        [9] Personal Care
        [10] Pharma & Wellness

-------------------------------------------------------
      MY CART=[91]          ABOUT US=[97]          EXIT=[98]
-------------------------------------------------------
choose :
```

```
                                              Ω My Cart : 0
                    <<<<- My Cart ->>>>


                    Empty Cart


-------------------------------------------------------
        HOME PAGE=[100]                EXIT=[98]
-------------------------------------------------------
choose :
```

```
                                              Ω My Cart : 0
        : Alpex Crab Meat (Body & Leg)
        : 200g
        : Rs.500

        ADD TO CART=[90]


-------------------------------------------------------
      MY CART=[91]          ADD TO CART=[90]          BACK=[99]
                    HOME PAGE=[100]        EXIT=[98]
-------------------------------------------------------
choose : 90
```

```
                                                    Ω My Cart : 0
        : Alpex Crab Meat (Body & Leg)
        : 200g
        : Rs.500

    ADD TO CART=[90]


--------------------------------------------------------------------
      MY CART=[91]              ADD TO CART=[90]              BACK=[99]
                        HOME PAGE=[100]          EXIT=[98]
--------------------------------------------------------------------
choose : 90
Enter Quantity : 6
Total amount you have to pay for this : Rs.3000
--------------------------------------------------------------------
Do you want to add Cart ? [Y]es OR [N]o : y
```

```
                                                    Ω My Cart : 4
                        <<<<- My Cart ->>>>

 1) Squid Cone                          500g      3      Rs.3600
 2) Alpex Cuttle Fish Fillet            500g      3      Rs.2400
 3) Australian Lamb Boneless Leg Slice  200g      3      Rs.2850
 4) Squid Cone                          500g      3      Rs.3600
                                                _____
 > Delivery charges                                 Rs.622.5 (5%)
                                                _____
 > Total amount                                     Rs.13072.5
                                                ================

--------------------------------------------------------------------
   CHECKOUT=[90]                 CHANGE QUANTITY=[91]    REMOVE PRODUCT=[92]
   CLEAR CART=[95]               HOME PAGE=[100]          EXIT=[98]
--------------------------------------------------------------------
choose : 90
--------------------------------------------------------------------
      Enter Your First Name : alex
      Enter Your Address : Makuluwa
      Enter Your City : Galle
      Enter Your E-mail : alex@gmail.com
      Enter Your Contact number : 07712345678
--------------------------------------------------------------------
Is the information you entered true? [Y]es OR [N]o : y
```

```
========================================================
             <<<< S L   O n l i n e   G r o c e r y >>>>
========================================================
              <<<<- Payment Method ->>>>


» Supported payment methods
                [1] Master Card
                [2] Visa Card
                [3] Pay Pal
                [4] eZ Cash


                                              _____
 > Total amount to be paid                         Rs.13072.5
                                              ==================

========================================================
        CANCEL=[98]
========================================================
choose : 2
========================================================
 Pay with Visa Card
        Card holder name: alex
        Card Number : 12341234123412
        Card expiry year : 12
        Card expiry Month : 19
        Card CVN  : 123
========================================================
Is the information you entered true? [Y]es OR [N]o : y
```

```
                        <<<<- My Bill ->>>>

                           DATE & TIME : Thu Jul 21 01:23:10 2022

Customer Name           : alex
Customer Address        : Makuluwa, Galle
Customer E-mail         : alex@gmail.com
Customer contact number : 7712345678
◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆

Payment method : Visa Card

 1) Squid Cone                            500g       3       Rs.3600
 2) Alpex Cuttle Fish Fillet             500g       3       Rs.2400
 3) Australian Lamb Boneless Leg Slice   200g       3       Rs.2850
 4) Squid Cone                            500g       3       Rs.3600
                                                 _____
 > Delivery charges                                   Rs.622.5 (5%)
                                                 _____
 > Total amount                                       Rs.13072.5
                                                 ==================
◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆

Delivery status : Pending


48 hour delivery, Thanks for being with us


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     DOWNLOAD MY BILL=[97]
▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬
choose : 97
```

```
=========================================================
                        ADMIN MENU
1. Add new product
2. Display stock
3. Refill through Vendor
4. Remove an item
5. Display status of order placed
6. Modify an item
7. Exit:


=========================END OF MENU===========================
```