DATA STRUCTURES & ALGORITHMS

PROJECT REPORT

SUBMITTED BY

RANIA KHAN(B23F0082CS073)

IRUM IMRAN(B23F0191CS075)

SUBMITTED TO

SIR SOHAIL KHAN

SIR ISHAQ HUSSAIN SHAH

DEPARTMENT

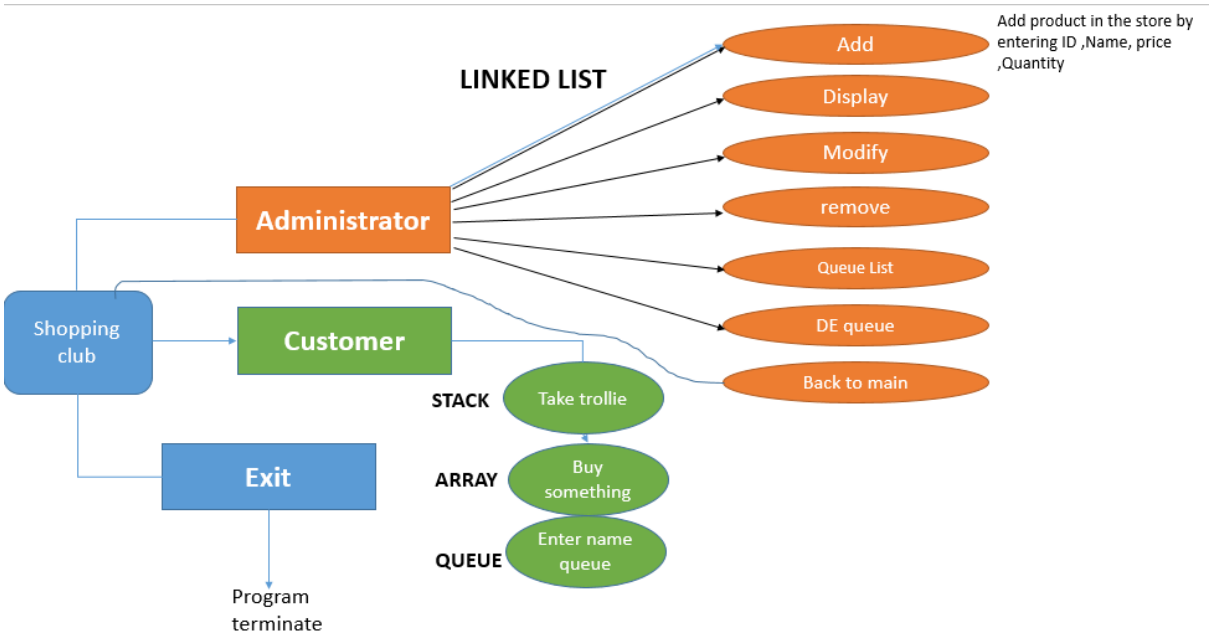
BS CS BLUE(F23

INTRODUCTION

The "Shopping Club" project is a comprehensive exploration of data structure implementation in the context of an online shopping platform. The system utilizes various data structures such as linked lists, queues, stacks, and arrays to efficiently manage customer interactions and product-related operations. The project is aimed at creating a seamless and user-friendly experience for both customers and administrators.

DATA STRUCTURES

- ARRAYS
- SINGLY LINKED LIST
- QUEUES
- STACKS



WORKING OF THE SYSTEM

The "Shopping Club" system functions as a virtual shopping environment with features for product management, customer interactions, and administrator control. The system's core operations are facilitated through the effective use of different data structures.

1. Linked Lists for Product Management:

- **Add Operation (Linked Lists):** New products are added to the inventory using linked lists. The system prompts the user to input essential product details, and the linked list efficiently handles the insertion at the appropriate position.

- **Display Operation (Linked Lists):** The linked list structure is employed to display the list of available products. This provides customers with a comprehensive view of the product catalog.

- **Modify and Remove Operations (Linked Lists):** Linked lists facilitate the modification and removal of products from the inventory. This dynamic data structure allows for flexibility in managing the product database.

2. Queues and Stacks for Customer Management:

- **Enqueue Operation (Queue):** Customers are enqueued into the system, forming a queue of waiting customers. This ensures a fair and organized shopping experience.

- **Dequeue Operation (Queue):** Customers are dequeued when they initiate a purchase or when their turn arrives. This mechanism enhances the overall efficiency of customer interactions.

- **Stacks (StackMe.h):** The stack data structure is used for managing customer interactions. The system utilizes stacks for maintaining a record of customers, ensuring smooth navigation between different functionalities.

3. Arrays for Product Purchase:

- **Buying a Product (Arrays):** Arrays are employed to manage the shopping cart. When a customer decides to buy a product, it is added to the array, allowing for easy tracking of selected items.

FUNCTIONS

1. Customer Management Functions:

- **EnqueueCustomer():** Adds a new customer to the waiting queue.
- **DequeueCustomer():** Removes the customer from the front of the queue when they initiate a purchase.

2. Product Purchase Functions:

- **BuyProduct(productID):** Adds the specified product to the customer's shopping cart.

3. Product Management Functions:

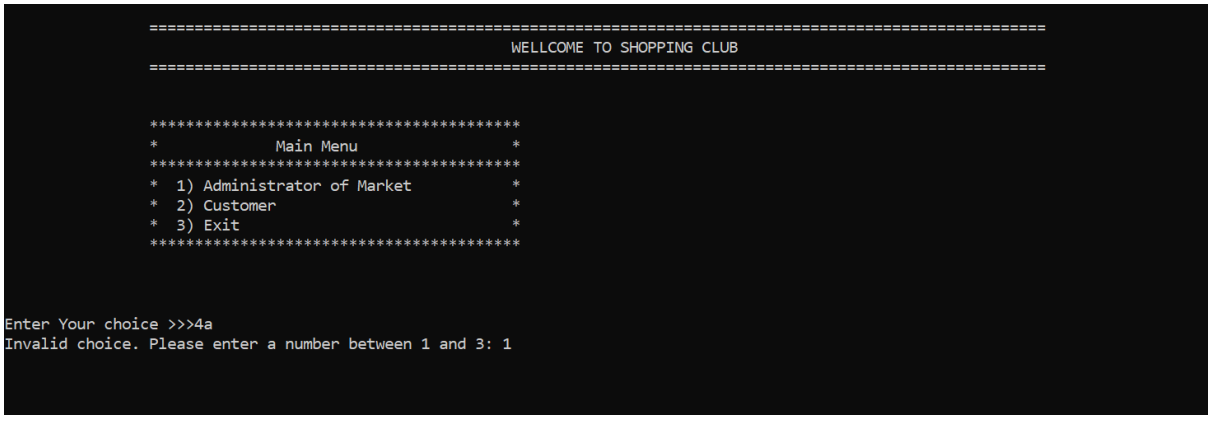
- **AddProduct(productDetails):** Adds a new product to the inventory.
- **DisplayProducts():** Displays the list of available products.
- **ModifyProduct(productID, newDetails):** Modifies the details of a specific product.
- **RemoveProduct(productID):** Removes a product from the inventory.

4. Administrator Functions:

- **Administrator():** Provides an interface for administrators to perform various tasks, including adding products, modifying existing products, deleting products, and managing the customer queue.

OUTPUT

- **MAIN MENU**



- **ADMINISTRATOR PORTAL:**

```
                Enter Administrator Password: admi

Incorrect password. Access denied.
```

```
                Enter Administrator Password: admin123

Access Granted
```

```
                ============================================
                |          Administrator Portal            |
                ============================================

                     1) Add a New Product
                     2) Display All Products
                     3) Modify an Existing Product
                     4) Delete a Particular Product Item
                     5) View Customers List
                     6) Dequeue Customer
                     0) Back to Main Menu

                ============================================
                     Please enter your choice >>>

Enter Your choice >>>
```

- **ADD A NEW PRODUCT:**

```
Enter product ID: 102
Enter product Name: Facewash
Enter product price: 999
Enter product quantity: 34
```

- **MODIFY PRODUCT:**

```
Enter ID to modify product Name and its price:
101
Existing products are:
ID              Product Name            Price           Quantity
================================================================================
101             Lotion          999             28
102             Facewash                999             34

Total products in our store is: 2



Old ID : 101
Old Name : Lotion
Old Price : 999
Old Quantity : 28


Enter new ID: 101
Enter new Name: Face Lotion
Enter new Price: 1800
Enter new Quantity: 38
```

- **DISPLAY:**

```
Existing products are:
ID              Product Name            Price           Quantity
================================================================================
101             Face Lotion             1800            38
102             Facewash                999             34

Total products in our store is: 2
```

- **VIEW CUSTOMER LIST:**

```
|============CUSTOMERS NAMES LIST==============|
Customers in the queue:
        irum
        rania
```

- **DEQUEUE CUSTOMER:**

```
|============CUSTOMERS NAMES LIST==============|
Customers in the queue:
        rania
```

- **CUSTOMER:**

```
How many items you want to buy?
2
Existing products are:
ID              Product Name            Price           Quantity
================================================================================
101             Lotion          999             28
102             Facewash                999             34

Total products in our store is: 2


Enter the ID of the item you want to buy: 101
How many quantities do you want: 21
Enter the ID of the item you want to buy: 102
How many quantities do you want: 13

                Enter Your Name: irum


                        You have bought: Lotion,Facewash,
Assigning a trolly number...
Your Trolli No is :50

Original price: 33966
With 10% discount: 30569
Thank you for shopping!

Press any key to continue . . .
```

- **EXITING THE SYSTEM:**

```
                ****************************************
                *             Main Menu                *
                ****************************************
                *  1) Administrator of Market          *
                *  2) Customer                         *
                *  3) Exit                             *
                ****************************************



Enter Your choice >>>3


                                        Thank You
```

CONCLUSION

The "Shopping Club" project demonstrates the effective implementation of data structures to create a feature-rich and responsive online shopping platform. By strategically using linked lists, queues, stacks, and arrays, the system achieves efficient product management and seamless customer interactions. This project showcases the importance of data structures in enhancing the functionality and user experience of real-world applications.