AIR UNIVERISTY AEROSPACE & AVIATION CAMPUS KAMRA

DEPARTMENT OF COMPUTER SCIENCE

DATA STRUCTURE

******* PROJECT DOCUMENTATION *******

GROUP MEMBERS NAMES:

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→ **SUBMITTED TO:** SIR TARIQ

DATED: 11 DEC,2021

PROJECT NAME: SIMULATOR FOR SHOPPING CLUB

INTRODUCTION:

This is a project of software simulator for shopping club. We will implement it by using different data structures i.e. Linked List and Queue. Different methods are uses. Queue data structures are used to make the list of customer names and to no of customers in queue, to see front customer and to dequeue. LinkedList is used to modify, insert delete products, buy, search node by id etc.

***REMAINING ALL OTHER WORKING BRIEF DETAILS IS ALONG THE FUNCTION BELOW**

NODE CLASS:

In Node Class we have creates objects of Node.

```
package com.zain;
public class Node {
   String name;
   Node next;
   int  ID;
   String proName;
   double proprice;
   int quantity;
}
```

QUEUE CLASS:

In Queue Class We have created function for enqueue for customers name list, deque the customer, size of the queue, And Show functions for Display the Names.

MAIN FUNCTIONS IN THIS CLASS

- **Enqueue** (Used for Customer names to make a queue)
- **Dequeue** (Used To dequeue Customer Name from List)
- **Size** (Used to Find the number of Customer In queue
- **Peek** (Used to See the Customer in Front)
- **Show** (To show the names of persons that are in queue)

```
package com.zain;
import java.util.Scanner;

public class Queue {
 int count=0;
Node front=null;
Node rear=null;
Scanner sc=new Scanner(System.in);
```

Enqueue:

```
public  void enqueue(String name)
{
```

```
   Node newNode=new Node();
   newNode.name=name;
   newNode.next=null;
   if(rear==null)
   {
      front=newNode;
   }
   else
   {
      rear.next=newNode;
   }
   rear=newNode;
   count++;
}
```

OUTPUT:

```
        Press 1 To Insert Product
        Press 2 To Modify Record
        Press 3 To Display
        Press 4 To DELETE
        Press 5 To See customer list
        Press 6 Dequeue Customer from list
        Press 7 To See Front Customer
        Press 8 To See No Of Persons In Queue

        Press 0 To Back TO MAIN
        ENTER YOU CHOICE
5
        **********   THE LIST OF CUSTOMER THAT ARE IN QUEUE **********
                Faizan
                Umar
                Jamshaid
                Asad
```

Dequeue:

```
public void deque()
```

```
  {
     int index;
     System.out.println("\tEnter 0 to Deque Customer from List : ");
     index=sc.nextInt();
     if(index==0)
     {
        front=front.next;
        count--;
        System.out.println("\t THE CUSTOMER IS Dequed ");
     }
  }
     }
```

OUTPUT:

```
        Press 1 To Insert Product
        Press 2 To Modify Record
        Press 3 To Display
        Press 4 To DELETE
        Press 5 To See customer list
        Press 6 Dequeue Customer from list
        Press 7 To See Front Customer
        Press 8 To See No Of Persons In Queue

        Press 0 To Back TO MAIN
        ENTER YOU CHOICE
6
        Enter 0 to Deque Customer from List :
0
         THE CUSTOMER IS Dequed
The Customer Is dequeed
```

```
5
       **********   THE LIST OF CUSTOMER THAT ARE IN QUEUE **********
              Umar
              Jamshaid
              Asad
```

OTHER REMAINING FUNCTIONS IN BELOW

```
    public void peek()
      {
         if(front==null)
      {

         System.out.println("\tThe queue is empty ");
      }
         else
      {
         System.out.println("\t The Front Customer Name is
="+front.name);

      }

      }
      public void isEmpty()
   {
      if(front==null)
      {

         System.out.println("The queue is empty");
      }
      else
      {
         System.out.println("The queue is not empty");

      }

   }
   public void size()
```

```
  {
     System.out.println("\t Length of Queue ="+ count);

  }
     public void Show()
     {
        Node current=front;
        while(current!=null)
        {
           System.out.println(current.name);
           current=current.next;
        }
     }
}
```

OUTPUT:

```
5
        **********   THE LIST OF CUSTOMER THAT ARE IN QUEUE **********
                Umar
                Jamshaid
                Asad
```

```
            ************ ADMINISTRATION SITE ***************

       Press 1 To Insert Product
       Press 2 To Modify Record
       Press 3 To Display
       Press 4 To DELETE
       Press 5 To See customer list
       Press 6 Dequeue Customer from list
       Press 7 To See Front Customer
       Press 8 To See No Of Persons In Queue

       Press 0 To Back TO MAIN
       ENTER YOU CHOICE
7
        *****  THE NAME OF CUSTOMER IS THE FRONT *******
        The Front Customer Name is =Umar

            ************ ADMINISTRATION SITE *********

       Press 1 To Insert Product
       Press 2 To Modify Record
       Press 3 To Display
       Press 4 To DELETE
       Press 5 To See customer list
       Press 6 Dequeue Customer from list
       Press 7 To See Front Customer
       Press 8 To See No Of Persons In Queue

       Press 0 To Back TO MAIN
       ENTER YOU CHOICE
8
        Length of Queue =3
```

LOGIN CLASS:

Basically, this function asks the person to enter username and password. then to enter into Next panel
Username= Zain
Password =1234

```
import java.util.Scanner;
public class Login {
   Scanner sc=new Scanner(System.in);
```

```
   public void Sec() {
      String user;
      int pass;

      System.out.println("\t\tEnter Username  ");
      user = sc.next();
      System.out.println("\t\tEnter Password ");
      System.out.println("\t");pass = sc.nextInt();
      if (user.equals("Zain") && (pass == 1234)) {
         System.out.println(" ACCESS GRANTED\n");
      } else {
         System.out.println("\t*** ERROR ...Sorry YOU Have Entered
Wrong Credinetals \n");
         System.out.println("\t ------>>>>>> PLEASE TRY AGAIN ");

         }

   }
}
```

OUTPUT:

```
1
                WELCOME TO MAIN-PANEL AREA

                 1) Cashier BLOCK
                 2) Customer BLOCK
                 3) EXIT

1
                Enter Username
Zain
                Enter Password

1234
ACCESS GRANTED
```

SHOPPING CLASS:

In this class we have made functions for deletion, insertion, buying, show, modify:

Insertion: Here we will insert the product details first it check whether node exist or not if not it will create node and then take data. Every time it will create a new Node and insert data in it

Deletion: In this we can delete products from their id number A users enters The ID first it will check that id exist or not. Then it will delete that product form the list

Modify: Here we will modify the inserted product with their id number it will check id first if id found then it will continue otherwise return back **"ID NOT FOUND"**.

BUY: Customer buys products that are inserted in the saved record via id number he will choose the product then he ask for to enter the quantity and then asks the person name and print the bill. Name that a user/Customer enters it will enqueue

Search:

In search function when a user enters the ID it checks whether the entered id exist or not. It will check every node will try to match the user entered ID & Existing ID. If ant any node it matches **it will return that NODE.**

CODE:

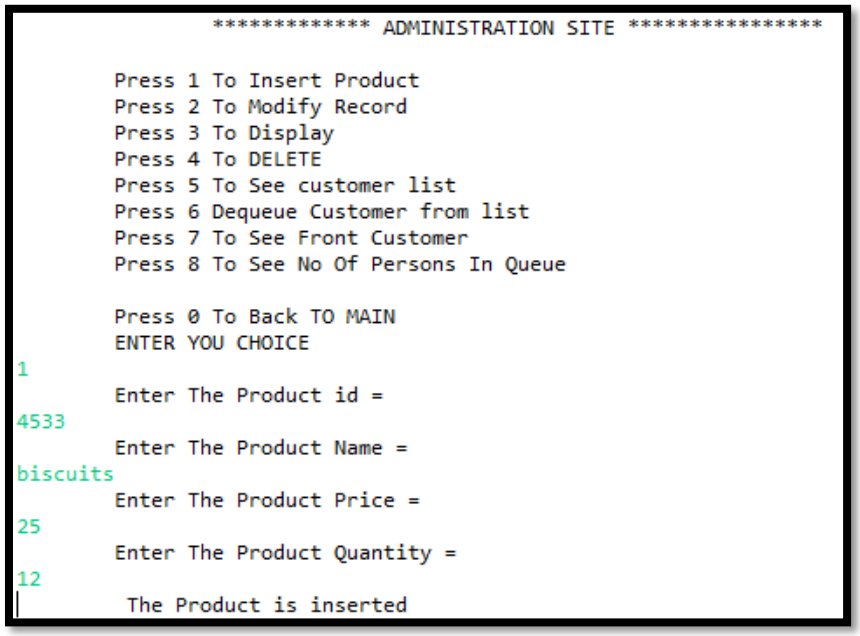
```
import java.util.Scanner;
class Shopping {
   Queue q = new Queue();
   Node head = null;
   Scanner sc = new Scanner(System.in);
   int input = sc.nextInt();
```

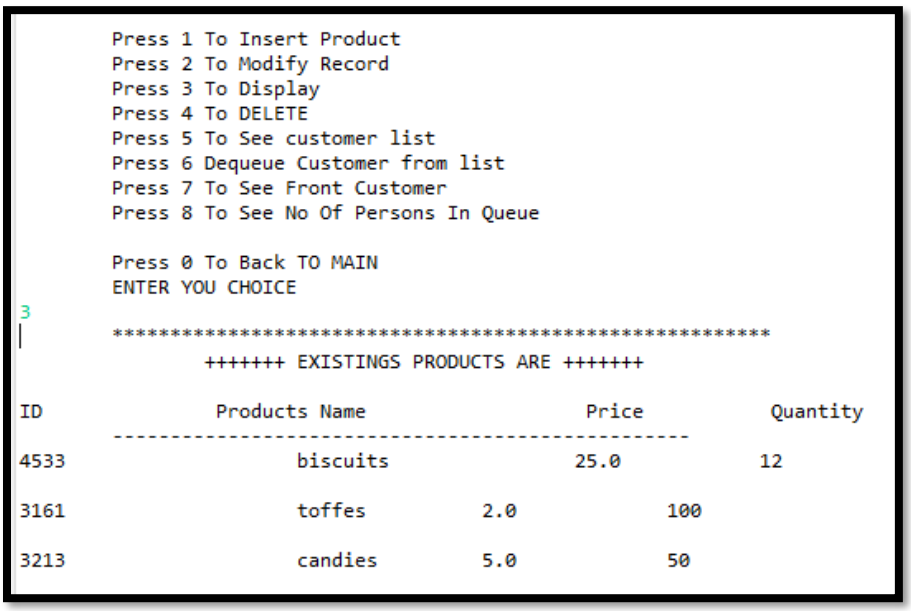
INSERTION:

```
public void start() {
      int id;
      int quant;
      String name;
      double pri;
      Node newNode = new Node();
      Node current = head;
      System.out.println("\tEnter The Product id =");
      id = sc.nextInt();
      newNode.ID = id;
      System.out.println("\tEnter The Product Name =");
      name = sc.next();
      newNode.proName = name;
      System.out.println("\tEnter The Product Price =");
      pri = sc.nextDouble();
      newNode.proprice = pri;
      System.out.println("\tEnter The Product Quantity =");
      quant = sc.nextInt();
```

```
    newNode.quantity = quant;

    if (head == null) {
       head = newNode;
    } else {
       while (current.next != null) {
          current = current.next;
       }
       current.next = newNode;
       newNode.next = null;
    }
    System.out.println("\t The Product is inserted\n");
  }
```

OUTPUT:





```
        Press 1 To Insert Product
        Press 2 To Modify Record
        Press 3 To Display
        Press 4 To DELETE
        Press 5 To See customer list
        Press 6 Dequeue Customer from list
        Press 7 To See Front Customer
        Press 8 To See No Of Persons In Queue

        Press 0 To Back TO MAIN
        ENTER YOU CHOICE
3
        ********************************************************
                +++++++ EXISTINGS PRODUCTS ARE +++++++

ID              Products Name                   Price           Quantity
        ------------------------------------------------
4533                    biscuits                25.0            12

3161                    toffes          2.0             100

3213                    candies         5.0             50
```

SEARCH :

```
public Node search(int id) {
   Node current = head;
   if (current == null) {
      System.out.println("\tLINKLIST IS EMPTY");
      return null;
   } else {
      while (current.next != null) {
         if (current.ID == id) {
            System.out.println("\tID FOUND\n");
            return current;
         }
         current = current.next;
      }
      if (current.ID == id) {
         System.out.println("\tID FOUND\n");
         return current;
      }
```

```
    }
    return null;
}
```

Modify:

```
public void Modify() {
        int id;
        double price;
        String pName;
        int nid;
        int nq;
        if (head == null) {
            System.out.println("\tlist is empty");
        } else {
            show();

            System.out.println("\t\tEnter Id to Modify Products Details");

System.out.println("=========================================
============================");
            System.out.println("\t\t\t "); id = sc.nextInt();
            Node current = search(id);
            if (current != null) {
                System.out.println("\tYOUR ENTERTED ID IS FOUND ");

                System.out.println("\n");
                System.out.println("\tOLD ID :" + current.ID);
```

```
            System.out.println("\tOLD NAME :" + current.proName);
            System.out.println("\tOLD PRICE :" + current.proprice);
            System.out.println("\tOLD Quantity :" + current.quantity);

            System.out.println("\n");
            System.out.println("\tEnter New The Product Id =");
            nid = sc.nextInt();
            current.ID = nid;
            System.out.println("\tEnter New The Product Name =");
            pName = sc.next();
            current.proName = pName;
            System.out.println("\tEnter New The Product Price =");
            price = sc.nextDouble();
            current.proprice = price;
            System.out.println("\tEnter New The Product Quantity =");
            nq = sc.nextInt();
            current.quantity = nq;
            System.out.println("::::::::::::::::::::::::::::::::::::::::::::::::::::::");
            System.out.println("\tYOUR DATA ENTERED SUCCESSFULLY ");
            System.out.println("\t\t  ~~~~~~~   AND  ~~~~~~~       ");
            System.out.println("\t  RECORD UPDATED SUCCESSFULLY \n");


        } else {
            System.out.println("\t YOUR ID IS NOT FOUND TRY AGAIN \n");

        }
    }
}
```

```
ID              Products Name                    Price          Quantity
        -------------------------------------------------
4533                    biscuits                25.0           12

3161                    toffes          2.0             100

3213                    candies         5.0             50

                Enter Id to Modify Products Details
=====================================================================

3213
        ID FOUND

        YOUR ENTERTED ID IS FOUND


        OLD ID :3213
        OLD NAME :candies
        OLD PRICE :5.0
        OLD Quantity :50


        Enter New The Product Id =
5533
        Enter New The Product Name =
 Choclates
        Enter New The Product Price =
10
        Enter New The Product Quantity =
24
:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
        YOUR DATA ENTERED SUCCESSFULLY
```

```
        ************************************************************
                +++++++ EXISTINGS PRODUCTS ARE +++++++

ID              Products Name           Price           Quantity
        ----------------------------------------------------
4533            biscuits                25.0            12

3161            toffes          2.0             100

5533            Choclate                10.0            24
```

Record Updated

Delete:

```
public void delete() {
      if (head == null) {
```

```
        System.out.println("List is Empty ");
    } else {
        int id;
        show();
        System.out.println("\t\t Enter ID to delete That Product =");
        id = sc.nextInt();
        Node current =head;
       if(current.ID==id)
       {
          if (current.next!=null)
          {
             head=head.next;
          }
          else
          {
             head=null;
          }

       }
       else
       {
         while (current.next!=null)
         {
            if (current.next.ID==id)
            {
               Node temp=current.next;
               current.next=temp.next;
               temp=null;
               return;
            }
```

```
            current=current.next;
          }
        }

      }
      System.out.println("\t THE PRODUCT IS DELETED");
  }
```

```
                +++++++ EXISTINGS PRODUCTS ARE +++++++

ID               Products Name           Price           Quantity
        ------------------------------------------------
4533            biscuits                25.0            12

3161            toffes          2.0             100

5533            Choclate                10.0            24

                 Enter ID to delete That Product =
3161
                WELCOME TO MAIN-PANEL AREA

                 1) Cashier BLOCK
                 2) Customer BLOCK
                 3) EXIT
```

Product deleted

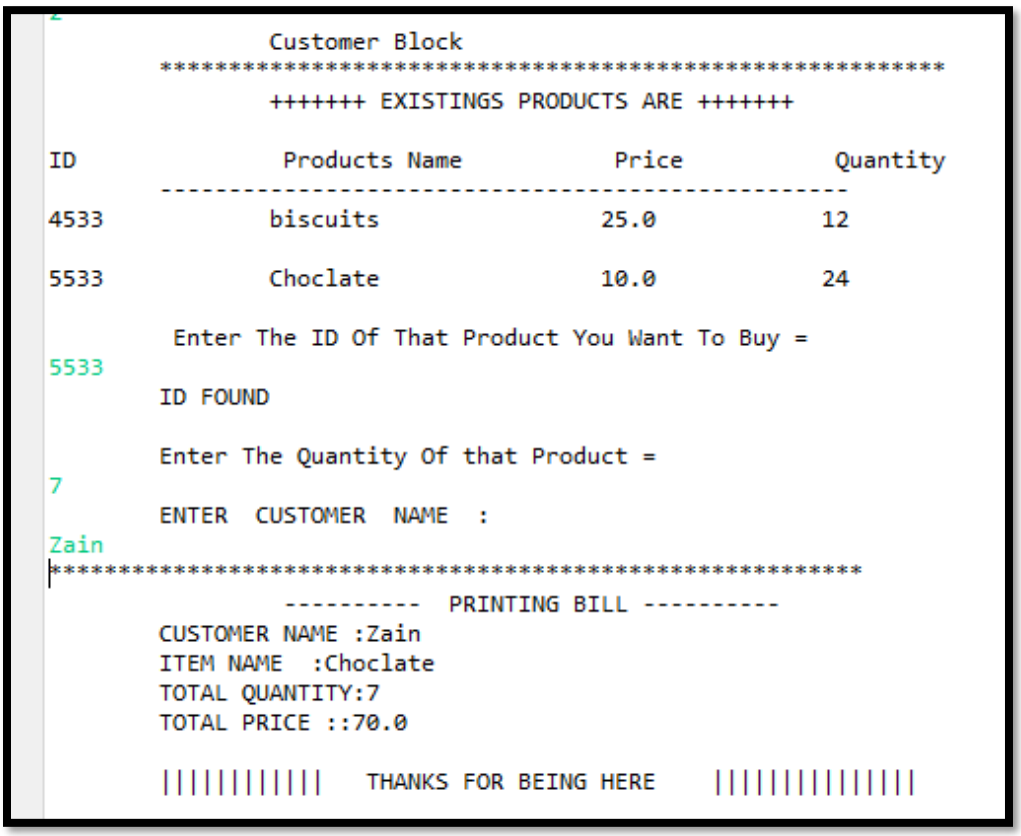
```
        ************************************************************
                +++++++ EXISTINGS PRODUCTS ARE +++++++

ID               Products Name           Price           Quantity
        ------------------------------------------------
4533            biscuits                25.0            12

5533            Choclate                10.0            24

                WELCOME TO MAIN-PANEL AREA

                 1) Cashier BLOCK
                 2) Customer BLOCK
                 3) EXIT
```

BUY:

```
public void buy() {
      String products[] = new String[30];
      Node current = head;
      show();
      int id, quantity, count, no, i ;
      if (head == null) {
         System.out.println("List is Empty  ");

      } else {
         // count = show();
         System.out.println("\t Enter The ID Of That Product You Want To
Buy =");
         id = sc.nextInt();
         //System.out.println("Enter The Quantity Of that Product ");
         // quantity = sc.nextInt();
         Node n = search(id);
         if (n == null) {
            System.out.println("\tID NOT FOUND\t");
         }
else {
            System.out.println("\tEnter The Quantity Of that Product =");
            quantity = sc.nextInt();
            if (n.quantity < quantity)
{
               System.out.println("\tThe Quantity You Entered Is Not
Available =");

            }

else
```

```
{
            System.out.println("\tENTER  CUSTOMER  NAME  :");
            String name = sc.next();
            q.enqueue(name);
            double totalprice = n.proprice * quantity;









System.out.println("*****************************************
*****************");

            System.out.println("\t\t ----------  PRINTING BILL ----------");
            System.out.println("\tCUSTOMER NAME :" + name);
            System.out.println("\tITEM NAME  :" + n.proName);
            System.out.println("\tTOTAL QUANTITY:" + quantity);
            System.out.println("\tTOTAL PRICE ::" + totalprice+"\n");
  System.out.println("\t|||||||||||   THANKS FOR BEING HERE
|||||||||||||| \n");



          }
        }
     }
  }
```

OUTPUT:



SHOW:

```
public int show() {

      Node current = head;

System.out.println("**********************************************
***************");
      System.out.println("\t\t+++++++ EXISTINGS PRODUCTS ARE
+++++++  \n");
      System.out.println("ID \t\t Products Name \t\t\t Price \t\t
Quantity");
      System.out.println("-----------------------------------------------");
      while (current != null) {
```

```
        System.out.print(current.ID + "\t\t\t\t" + current.proName +
"\t\t\t\t" + current.proprice + "\t\t\t" +(current.quantity) + "\n");
        current = current.next;
        System.out.println("\n");
      }
      return 0;
   }
```

```
ID              Products Name           Price           Quantity
        ---------------------------------------------------
4533            biscuits                25.0            12

5533            Choclate                10.0            24
```

ADMIN:

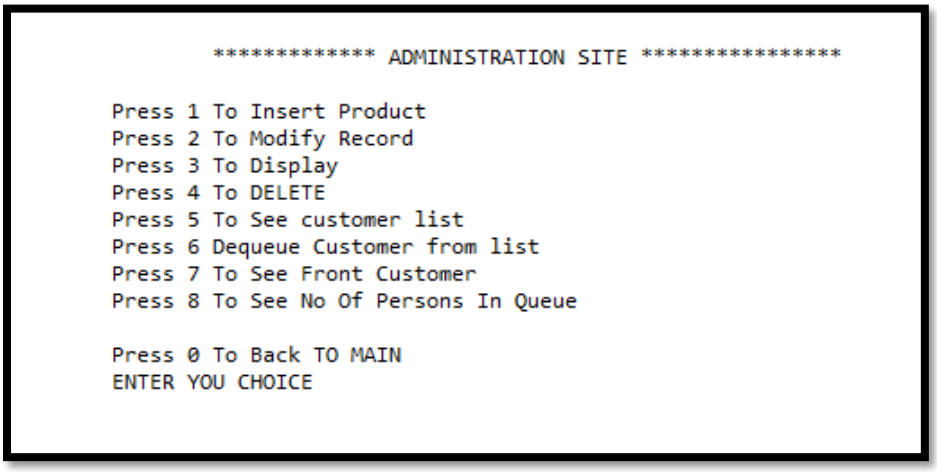
Here we used cases in them we call functions

```
int ch;
      public int Admin ()
      {

         System.out.println("\tPRESS 1 TO Insert Product  ");
         System.out.println("\tPress 2 to Modify Record ");
         System.out.println("\tPress 3 to Display ");
         System.out.println("\tPress 4 to DELETE ");
         System.out.println("\tPress 5 to See customer list ");
         System.out.println("\tPress 6 Deque Customer from list ");
         System.out.println("\tPress 7 to See Front Customer ");
         System.out.println("\tPress 8 to See Queue Length ");
         System.out.println("\tPress 0 to Back At Any \n");
```

```
        System.out.println("\tENTER YOU CHOICE ");
        ch = sc.nextInt();
        switch (ch) {

           case 1:
              start();
              return Admin();

           case 2:
              Modify();
              return Admin();
           case 3:
              show();
              return Admin();
           case 4:
              delete();
              return Admin();
              case 5:
                 System.out.println("\t**********   THE LIST OF
CUSTOMER THAT ARE IN QUEUE ********** ");
                 q.Show();
                 return Admin();
           case 6:

              q.deque();
              System.out.println("The Customer Is dequeed ");
              return Admin();
           case 7:
              System.out.println("\t *****  THE NAME OF CUSTOMER IS
THE FRONT ******* \n");
```

```
            q.peek();
            return Admin();
         case 8:
            q.size();
            return Admin();
      }

      return 0;
   }
}
```

OUTPUT:



MAIN:

In Main simply I made objects of classes and used it to
Use do while loop and switch cases to implement my code

```
package com.zain;
```

```
import java.util.Scanner;

public class Main {

   public static void main(String[] args) {
      Scanner sc = new Scanner(System.in);
      Shopping shop = new Shopping();
      Login log=new Login();
      log.Sec();

      int ch;
      do {
         System.out.println("WELCOME TO MAIN-PANEL AREA \n");
         System.out.println("\t\t 1) Cashier BLOCK ");
         System.out.println("\t\t 2) Customer BLOCK ");
         System.out.println("\t\t 3) EXIT ");
         System.out.println("   ");
         ch = sc.nextInt();

         switch (ch) {
            case 1:
        System.out.println("************** ADMINISTRATION SITE
**************** \n");

               shop.Admin();
               break;
            case 2:
               System.out.println("Customer Block  ");
               shop.buy();
```

```
        }
    }
    while (ch != 7);
}
  }
```

OUTPUT:

```
                WELCOME TO MAIN-PANEL AREA

                 1) Cashier BLOCK
                 2) Customer BLOCK
                 3) EXIT
```

```
                Customer Block
*********************************************************
                +++++++ EXISTINGS PRODUCTS ARE +++++++

ID               Products Name                  Price          Quantity
-------------------------------------------------
                List is Empty


                WELCOME TO MAIN-PANEL AREA

                 1) Cashier BLOCK
                 2) Customer BLOCK
                 3) EXIT
```

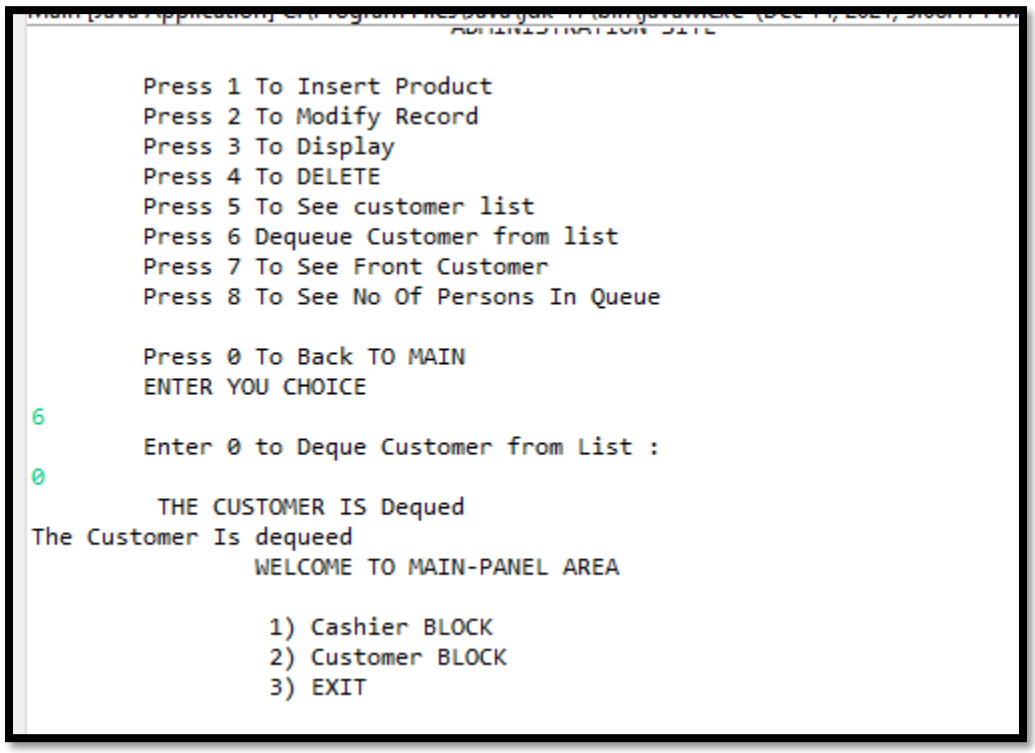
```
                WELCOME TO MAIN-PANEL AREA

                 1) Cashier BLOCK
                 2) Customer BLOCK
                 3) EXIT

3
                 ******  WELCOME ******

                | PROJECT NAME SHOPPING SIMULATOR |

        ============================================================
                            MADE BY
                         ZAIN SHAKOOR
                            FIZA
                            RUBAB
                          BSCS-3B
        ********************************************
           <<<<<<<<<<<<<  THANKS  >>>>>>>>>>>>>
```

OVERALL OUTPUT:

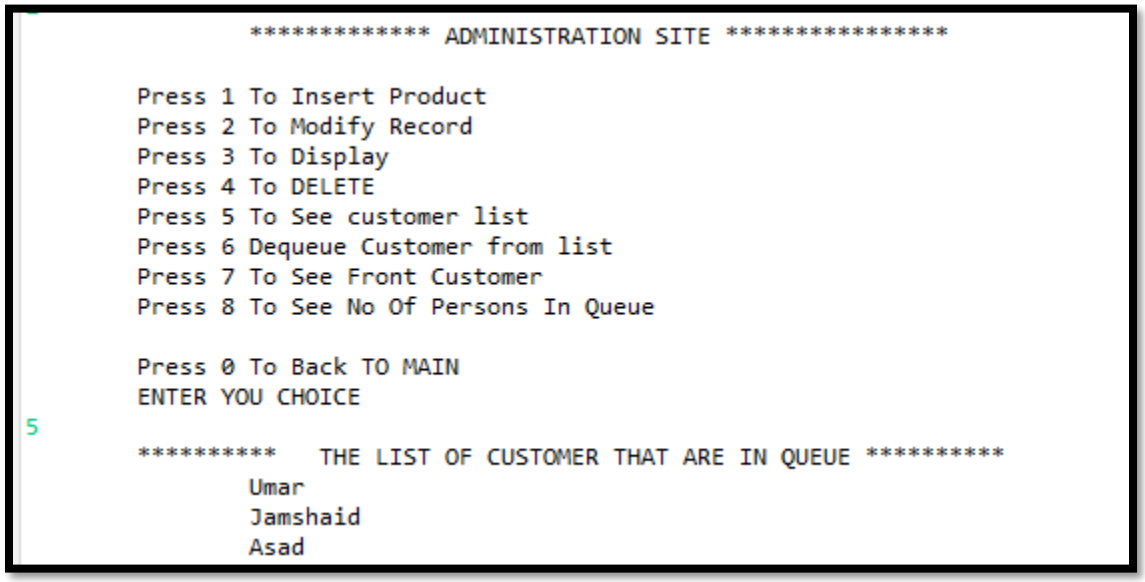
```
1
                WELCOME TO MAIN-PANEL AREA

                 1) Cashier BLOCK
                 2) Customer BLOCK
                 3) EXIT

1
                ************ ADMINISTRATION SITE ***************

        Press 1 To Insert Product
        Press 2 To Modify Record
        Press 3 To Display
        Press 4 To DELETE
        Press 5 To See customer list
        Press 6 Dequeue Customer from list
        Press 7 To See Front Customer
        Press 8 To See No Of Persons In Queue

        Press 0 To Back TO MAIN
        ENTER YOU CHOICE
1
        Enter The Product id =
4543
        Enter The Product Name =
er
        Enter The Product Price =
432
        Enter The Product Quantity =
12
         The Product is inserted
```

```
            Customer Block
        ********************************************************
                +++++++ EXISTINGS PRODUCTS ARE +++++++

ID               Products Name           Price           Quantity
        ------------------------------------------------
4543            er              432.0           12

         Enter The ID Of That Product You Want To Buy =
4543
        ID FOUND

        Enter The Quantity Of that Product =
5
        ENTER  CUSTOMER  NAME  :
Faizan
**********************************************************
                ----------  PRINTING BILL ----------
        CUSTOMER NAME :Faizan
        ITEM NAME  :er
        TOTAL QUANTITY:5
        TOTAL PRICE ::2160.0
```

```
                ************* ADMINISTRATION SITE ****************

        Press 1 To Insert Product
        Press 2 To Modify Record
        Press 3 To Display
        Press 4 To DELETE
        Press 5 To See customer list
        Press 6 Dequeue Customer from list
        Press 7 To See Front Customer
        Press 8 To See No Of Persons In Queue

        Press 0 To Back TO MAIN
        ENTER YOU CHOICE
5
        **********   THE LIST OF CUSTOMER THAT ARE IN QUEUE **********
                Faizan
                Umar
                Jamshaid
                Asad
```



```
        Press 1 To Insert Product
        Press 2 To Modify Record
        Press 3 To Display
        Press 4 To DELETE
        Press 5 To See customer list
        Press 6 Dequeue Customer from list
        Press 7 To See Front Customer
        Press 8 To See No Of Persons In Queue

        Press 0 To Back TO MAIN
        ENTER YOU CHOICE
6
        Enter 0 to Deque Customer from List :
0
         THE CUSTOMER IS Dequed
The Customer Is dequeed
                WELCOME TO MAIN-PANEL AREA

                 1) Cashier BLOCK
                 2) Customer BLOCK
                 3) EXIT
```



```
                ************* ADMINISTRATION SITE ***************

        Press 1 To Insert Product
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        Press 0 To Back TO MAIN
        ENTER YOU CHOICE
5
        **********   THE LIST OF CUSTOMER THAT ARE IN QUEUE **********
                Umar
                Jamshaid
                Asad
```

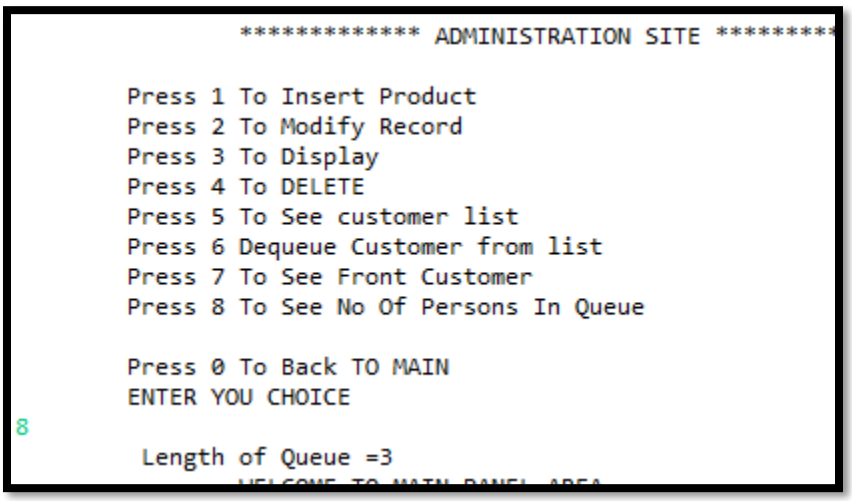
********** ADMINISTRATION SITE ********
Press 1 To Insert Product
Press 2 To Modify Record
Press 3 To Display
Press 4 To DELETE
Press 5 To See customer list
Press 6 Dequeue Customer from list
Press 7 To See Front Customer
Press 8 To See No Of Persons In Queue
Press 0 To Back TO MAIN
ENTER YOU CHOICE
8
Length of Queue =3

END

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