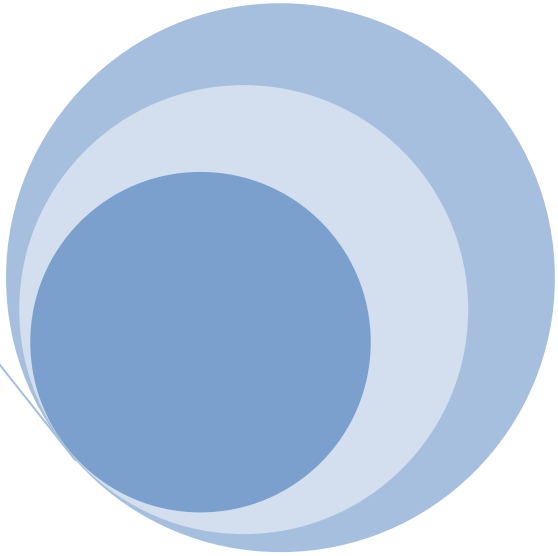

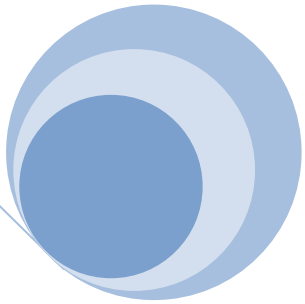

King Fahd University Of Petroleum and Minerals

Department of Information and Computer Science
ICS 102 – Introduction to Computing

Semester Project – Computer Software Store

Instructor - Dr. Mohammad Al-Shayeb.

Shaeq Pervez Khan

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Objective:

This project made us use the concepts and ideas we have been studying about all through the course this semester. This project put to test our understanding of the various topics introduced to us in this course. It tested our application capabilities by making us utilize what we have learnt. So, overall the project was a major learning experience for me and actually helped me discover topics which were not clear to me prior to the project.

Project Summary:

The project asked us to write a consol program that manages a computer software store for a maximum of 20 items.

We were given a file and were asked to read the information from the file. Then we would assign the data to an array using an object of a class also created by us.

The class made it easier for us to perform operation on the data read from file. So we display a menu which allows the user to perform some operations on the data in the file.

But before we give this option, we read all the information available from the file and store it in an array of an object of class "*SoftwareCompany*" (In this case).

The class "*SoftwareCompany*":

This class *SoftwareCompany* has declared variables which store the information such as the company name, product name, price and the quantity. It also has methods (getters and setters) which help us to access the variables or to change them.

One of the most important declarations in the class is that of the *constructor* which initializes the variables as soon as the object of the class is created provided that when the objects are created the proper and legal parameters are passed.

The class "*SoftwarePurchase*":

The class "*SoftwarePurchase*" is a test class for the class "*SoftwareCompany*". We use it to initialize the data read from the file to an object of type array. We use a 1D array to store the information for one product. This way we can initialize its size to 20.

In this class, first we read the file and initialize the objects. Then we use the function *hasNextLine*() which determines the number of products available in the store at that time. Now, we display a menu asking the user to input their choice.

Choice 1: Display the whole Inventory

Here we simply display the objects of the class *SoftwareCompany* using the object name "*items*". Since there are many products read from the file, we use a for loop to display the information for all the products individually. To make things easier we use a method *toString* to display the information.

Choice 2: Display the products of a Company

For this code we first ask the user to input the company's name of whose product they are looking for. Then using *getters* we compare the entered name to all the company's product available in the store and then using a *if loop* we display all the products.

Choice 3: Check the availability of a Product

In this code we ask the user to enter the product name. Then using *getters* we compare the entered name to those available in the file. Then using a *if loop* we display if the product is available or not. There is a very simple *do while loop* also which asks the user if they want to continue with the same operation or exit to the main menu.

Choice 4: Modify the price of an item

In this code we ask the user to enter the company name and the product name. Then using *getters* we compare these values to make sure the user is changing the price of the item he/she wants to. Then using a *setter* in the class *SoftwareCompany* we assign a new price entered by the user but in the meantime making sure that the value entered is more than zero.

Choice 5: Add an item to the store

In this code we ask the user to enter all desired value like the company name, product name, price and quantity. After this we make sure that the product is not already present in the store. This is done by using *getters* again which compare the company and product name with that of the names present in the file. Then the program also makes sure that the value of price entered by the user is greater than zero. Using the *counter* mentioned previously we enter the new data in the correct for to the store.

Choice 6: Make purchase and compute total bill

This part of the code interacts with the user to ask them if they want to purchase any of the products available in the store. The user is asked to enter the name of the product they want to buy. Then the total bill of the purchase is computed and shown to the customer. A simple *do while loop* makes sure the customer exits only if they don't want to shop anymore.

Choice 7: Exit

As the name suggests, this part of the code exits the user from the program but before exiting it writes all the changes performed on the file to a new file so that the changes are saved. It also gives the user an option to print the final inventory if they want to.

```java
/**
 *
 * Information and Computer Science (ICS) Department
 * College of Computer Sciences and Engineering (CCSE)
 * King Fahd University of Petroleum and Minerals - KFUPM
 * Dhahran, Saudi Arabia
 *
 * Course - ICS 102 Term 073
 *
 * This is the class definition in order to store objects read from the file "Software Store.txt".
 *
 * Author: Shaeq Pervez Khan
 * Date of Submission: 23 August 2008
 */


import java.util.Scanner;

public class SoftwareCompany {

   // The four variables that will store data read from file.
   String companyName, productName;
   int priceOfProduct=0;
   int quantityOfProduct=0;

   // Constructor that will help initialize the variables.
   public SoftwareCompany(String coName, String proName, int price, int quantity){
         companyName = coName;
         productName = proName;
         priceOfProduct = price;
         quantityOfProduct = quantity;
   }

   // Method(getter) to return the Company Name.
   public String getCompanyName(){
         return companyName;
   }

   // Method(getter) to return the name of the product.
   public String getProductName(){
         return productName;
   }

   // Method(getter) to return the price of ONE unit of the product.
   public int getPriceOfProduct(){
         return priceOfProduct;
   }
```

```
    // Method(getter)to return the quantity of products available in the store.
    public int getQuantityOfProduct(){
        return quantityOfProduct;
    }

    // Method(setter) to initialize the price of the product.
    public void setPrice(int price){
        priceOfProduct = price;
    }

    //Method(setter) to assign a value to the quantity of products
    public void setQuantityOfProduct(int quantity){
        quantityOfProduct = quantity;
    }

    // Method to print the objects of the class using only its name.
    public String toString(){
        return(companyName + "\t\t" + productName + "\t\t" + priceOfProduct + "\t\t" +
        quantityOfProduct);
    }

    // Method to change the price of a product.
    public int modifyPrice(String nameOfProduct){

        int flag=0;

        Scanner keyboard = new Scanner(System.in);

        System.out.println();
        System.out.println("YOU ARE GOING TO MODIFY THE PRICE OF THE PRODUCT : " +
        nameOfProduct);
        System.out.println();
        System.out.println("ENTER A NEW PRICE FOR THE PRODUCT : ");

        int newPrice = keyboard.nextInt();

        if(newPrice<=0){
            System.out.println("CANNOT ACCEPT A NEGATIVE PRICE.");
            System.out.println("PLEASE RE-ENTER A NEW PRICE.");
            return 0;
        }
        return newPrice;
    }
}
```

```
/**
 *
 * Information and Computer Science (ICS) Department
 * College of Computer Sciences and Engineering (CCSE)
 * King Fahd University of Petroleum and Minerals - KFUPM
 * Dhahran, Saudi Arabia
 *
 * Course - ICS 102 Term 073
 *
 * This is the main class that reads information from "Software Store.txt", updates and deletes information.
 *
 * Author : Shaeq Pervez Khan
 * Date of Submission : 23 August 2008
 */

import java.util.Scanner;
import java.io.PrintWriter;
import java.io.FileInputStream;
import java.io.FileOutputStream;
import java.io.FileNotFoundException;

public class SoftwarePurchase {

   public static void main(String[] args){

        int choice=0; // Take input value from the user for his choice based on the menu given.

        int count=0; // counter to count the number of products in the software store

        String answer="n";

        // Creating an object of class Scanner by the name of "keyboard".
        Scanner keyboard = new Scanner(System.in);

        System.out.println("ICS 102 PROJECT");
        System.out.println("***************");
        System.out.println("THIS IS A CONSOL PROGRAM THAT MANAGES A COMPUTER SOFTWARE STORE
        FOR MAXIMUM OF 20 ITEMS.\n");

        // The following statement will create an object "items" of class SoftwareCompany of the type
        //arrays.
        SoftwareCompany[] items = new SoftwareCompany[20];

        // Initializing the objects of class Scanner and PrintWriter.
        Scanner inputStream = null;
        PrintWriter outputStream = null;
```

```
//The following code is to get the number of products in the store by using a counter.
try{
        inputStream = new Scanner(new FileInputStream("Software Store.txt"));
}
catch(FileNotFoundException e){
   System.out.println("File Not Found.");
   System.out.println("ERROR!");
   // Will display exception errors if it does not find the file on the mentioned path.
}
String header = inputStream.nextLine();
while(inputStream.hasNextLine()){
        inputStream.nextLine();
        count++; // counter to count the number of products.
}
inputStream.close();

// The following code is to read information from the file "Software Store.txt" and create objects of
// type array of class "SoftwareCompany".
try{
        inputStream = new Scanner(new FileInputStream("Software Store.txt"));
}
catch(FileNotFoundException e){
   System.out.println("File Not Found.");
   System.out.println("ERROR!");
}

String junk = inputStream.nextLine();
for(int i=0;i<count;i++){
        String s1 = inputStream.next();
        String s2 = inputStream.next();
        int n = inputStream.nextInt();
        int q = inputStream.nextInt();
        items[i] = new SoftwareCompany(s1,s2,n,q);
        // initializing the object of class SoftwareCompany by reading data from the file.
}
inputStream.close();

// A do-while loop to display the menu whenever an operation is completed.
do{
        System.out.println();
        System.out.println("1. DISPLAY THE WHOLE INVENTORY.");
        System.out.println("2. DISPLAY PRODUCTS OF A COMPANY.");
        System.out.println("3. CHECK THE AVAILIBILITY OF A PRODUCT.");
        System.out.println("4. MODIFY THE PRICE OF AN ITEM.");
        System.out.println("5. ADD AN ITEM TO THE STORE.");
        System.out.println("6. PURCHASING SOFTWARE FROM STORE.");
        System.out.println("7. EXIT.");
        System.out.println();
        System.out.println("ENTER YOUR CHOICE (in numbers 1 to 7) : ");
        choice = keyboard.nextInt();
```

```
// if loop to make sure that choice entered is correct.
if(choice<=0 || choice>7){
	System.out.println("!! ERROR !! ");
	System.out.println();
	System.out.println("WRONG CHOICE ENTERED. PLEASE ENTER THE RIGHT CHOICE.");
	System.out.println();
	choice=0;
	/* this will assign the value of choice to 0
	 *whenever the user enters invalid option number
	 *to make sure the program does not terminate.*/
}

/* Loop for choice 1.
 * We read all the elements of the
 * object "items" and simply display it.*/
if(choice==1){
	System.out.println();
	System.out.println("Your choice is : 1. DISPLAY THE WHOLE INVENTORY. ");
	System.out.println();
	System.out.println("Company Name\tProduct Name\tPrice\tQuantity");
	for(int i=0;i<count;i++){
		System.out.println(items[i]); // This will display all the variables of items.
	}
	System.out.println();
	System.out.println("THANK YOU FOR USING OUR SERVICES.");
	System.out.println("PLEASE WAIT FOR A MOMENT... WHILE WE REDIRECT YOU TO
	THE MAIN MENU.");
}

/* Loop for choice 2.
 * We only read the product name from the object
 * using getters from class "SoftwareCompany" and
 * simply display it.*/
if(choice==2){
	System.out.println();
	System.out.println("Your choice is : 2. DISPLAY PRODUCTS OF A COMPANY.");
	System.out.println();
	System.out.println("ENTER THE COMPANY NAME OF WHOSE PRODUCT YOU WANT :
	");
	String compName = keyboard.next();
	System.out.println();
	System.out.println("THE PRODUCTS AVAILABLE FOR THE COMPANY " + compName +
	" IN THE STORE ARE : ");
	System.out.println();
	for(int i=0;i<count;i++){
		if(compName.equalsIgnoreCase(items[i].getCompanyName())){
			System.out.println("PRODUCT : " + items[i].getProductName());
			// getProductName() is the getter that returns the product name.
		}
```

```
        }
        System.out.println();
        System.out.println("THANK YOU FOR USING OUR SERVICES.");
        System.out.println("PLEASE WAIT FOR A MOMENT... WHILE WE REDIRECT YOU TO
        THE MAIN MENU.");
}

/* Loop for choice 3.
 * To check the availibilty we read the product name
 * to be changed and compare it to the product names
 * stored in the object. Then we make sure its quantity
 * is more than 0 and the display the result. */
if(choice==3){
        System.out.println();
        System.out.println("Your choice is : 3. CHECK THE AVAILIBILITY OF A PRODUCT.");
        do{
                int flag=0; // indicator to make sure that the product is found in the store.
                int quantity=0;
                System.out.println();
                System.out.println("ENTER THE NAME OF THE PRODUCT : ");
                String nop = keyboard.next();
                System.out.println();
                for(int i=0;i<count;i++){
                        String nameFromFile = items[i].getProductName();
                        // Loop to compare the entered product name and the product name
                        // from the file.
                        if(nop.equalsIgnoreCase(nameFromFile)){
                                flag=1;
                                quantity = items[i].getQuantityOfProduct();
                                // getter to get the quantity of product in store.
                        }

                }
                // Loop to check availibility of the product entered.
                // Also makes sure that quantity is more than 0.
                if(flag==1 && quantity>0){
                        System.out.println("THE PRODUCT " + nop + " IS IN STOCK. WE HAVE "
                        + quantity + " LEFT IN THE STORE." );
                        System.out.println();
                }
                else
                        System.out.println("I'M SORRY! THE PRODUCT " + nop + " IS NOT IN
                        STOCK.");
                        System.out.println();

                System.out.println("DO YOU WANT TO CHECK THE AVAILIBILTY OF MORE
                PRODUCTS?(Enter y for yes, n for no) : ");
                answer = keyboard.next();
        }while(answer.equals("Y") ||answer.equals("y"));
```

```
            System.out.println();
            System.out.println("THANK YOU FOR USING OUR SERVICES.");
            System.out.println("PLEASE WAIT FOR A MOMENT... WHILE WE REDIRECT YOU TO
            THE MAIN MENU.");
}

/* Loop for choice 4. This is to modify the price of an item.
 * We check the availibilty of the product and then using a
 * setter from class "SofwareCompany" we modify the price.*/
if(choice==4){

            System.out.println("Your choice is : 4. MODIFY THE PRICE OF AN ITEM.");
            do{
                        int newPrice=0,flag=0;
                        System.out.println();
                        System.out.println("THE PRODUCTS AVAILABLE IN THE STORE ARE AS
                        FOLLOWS.");
                        System.out.println();
                        for(int i=0;i<count;i++){
                        System.out.println("PRODUCT " + (i+1) + " : " + items[i].getProductName() +
                        "\tPRICE : " + items[i].getPriceOfProduct());
                        }
                        // The 2 getters used are for the name and the price of the product.
                        System.out.println();
                        System.out.println("YOU ARE NOW GOING TO CHANGE THE PRICE OF AN
                        ITEM.");
                        System.out.println();
                        System.out.println("ENTER THE PRODUCT NAME FOR WHICH YOU WANT TO
                        CHANGE THE PRICE (Please use _ between spaces): ");

                        String nop = keyboard.next();

                        for(int i=0;i<count;i++){
                                    String nameFromFile = items[i].getProductName();
                                    if(nop.equalsIgnoreCase(nameFromFile)){
                                                newPrice = items[i].modifyPrice(nameFromFile);
                                                // This is a getter to make sure that the price entered is
                                                // positive and not 0.

                                                // this is to make sure that the price entered is more than 0.
                                                if(newPrice == 0){
                                                            System.out.println("PRICE ENTERED IS EITHER ZERO OR
                                                            NEGATIVE.");
                                                            break;
                                                }
                                                items[i].setPrice(newPrice); // This is the setter to enter the
                                                new price.
                                                flag=1;
                                    }
                        }
```

```
                if(flag==0){
                        System.out.println();
                        System.out.println("I'M SORRY. THE PRODUCT ENTERED IS NOT
                        AVAILABLE.");
                        System.out.println();
                }
                else{
                        System.out.println();
                        System.out.println("THE PRICE OF " + nop + " HAS BEEN CHANGED TO
                        " + newPrice);
                        System.out.println();
                }
                System.out.println("DO YOU WANT TO CHANGE THE PRICE OF MORE
                PRODUCTS?(Enter y for yes, n for no) : ");
                answer = keyboard.next();
        }while(answer.equals("Y") ||answer.equals("y"));

        System.out.println();
        System.out.println("THANK YOU FOR USING OUR SERVICES.");
        System.out.println("PLEASE WAIT FOR A MOMENT... WHILE WE REDIRECT YOU TO
        THE MAIN MENU.");
}

/* Loop for choice 5. This is to add a new item to the store.
 * We do this by first making sure that the new item we are
 * trying to enter is already available in the store. Then we
 * also make sure that the price we enter for the new item is
 * greater than zero. Also the loop does not add anymore items
 * if there are 20 items available in the store.*/
if(choice==5){
        int flag=0;
        System.out.println("Your choice is : 5. ADD AN ITEM TO THE STORE.");
        // Loop to make sure program does not store products more than 20.
        if(count>=20){
                System.out.println("ERROR.");
                System.out.println("CANNOT ADD MORE ITEMS TO THE SHOP.");
                System.out.println("THE SHOP IS FULL.");
        }
        if(count<20){
                do{
                System.out.println();
                System.out.println("YOU ARE NOW GOING TO ENTER A NEW PRODUCT.
                PLEASE MAKE SURE YOU HAVE ALL THE DESIRED INFORMATION.");
                System.out.println();
                System.out.println("ENTER THE COMPANY NAME : ");
                String companyName = keyboard.next();
                System.out.println();
                System.out.println("ENTER NAME OF THE PRODUCT : ");
                String productName = keyboard.next();
                System.out.println();
```

```
                System.out.println("ENTER PRICE OF THE PRODUCT : ");
                int price = keyboard.nextInt();
                // Making sure that the price entered by user is more than 0.
                if(price<=0){
                        System.out.println("PLEASE RE-ENTER PRICE. IT CANNOT BE 0.");
                        System.out.println("ENTER THE PRICE OF THE PRODUCT : ");
                        price = keyboard.nextInt();
                }
                System.out.println();
                System.out.println("ENTER QUANTITY OF PRODUCTS THAT ARE INITIALLY
                AVAILABLE IN THE STORE : ");
                int quantity = keyboard.nextInt();
                for(int i=0;i<count;i++){
                        // Loop to check if the product is already available in the store.
                        // getters used to get the company name and the product name.
                if(companyName.equalsIgnoreCase(items[i].getCompanyName())          &&
                productName.equalsIgnoreCase(items[i].getProductName())){
                                System.out.println();
                                System.out.println("ERROR!");
                                System.out.println();
                                System.out.println("REDUNDANT DATA.");
                                System.out.println();
                                System.out.println("PRODUCT " + productName + " ALREADY
                                EXISTS IN THE STORE." );
                                flag=1;
                                break;
                        }
                }
                // This loop will add the new information entered bby user as a new item at
                the store.
                if(flag==0 && count<20){
                        items[count]                    =                    new
                        SoftwareCompany(companyName,productName,price,quantity);
                        count++;
                        // the above creates one more item for the store.
                        System.out.println();
                        System.out.println("NEW ITEM SUCCESSFULY ADDED.");
                        System.out.println();
                        System.out.println("Company                    Name\tProduct
                        Name\tPrice\tQuantity");
                        for(int i=0;i<count;i++){
                                System.out.println(items[i]);
                        }
                }
                        System.out.println();
                        System.out.println("DO YOU WANT TO ADD ANOTHER ITEM TO THE
                        STORE? (Enter y for yes, n for no) : ");
                        answer = keyboard.next();
        }while(answer.equals("Y") ||answer.equals("y"));
```

```
        }

        System.out.println();
        System.out.println("THANK YOU FOR USING OUR SERVICES.");
        System.out.println("PLEASE WAIT FOR A MOMENT... WHILE WE REDIRECT YOU TO
        THE MAIN MENU.");
}

/* Loop for choice 6. This will help a user to purchase any
 * available items in the store. It will also compute the
 * total price after the user has finished shopping. This
 * will check the availibilty of the product entered by the
 * user with those present in the store and give the option
 * of purchasing it. */
if(choice==6){
        int sum=0;
        System.out.println();
        System.out.println("Your choice is : 6. PURCHASING SOFTWARE FROM STORE.");
        do{
                int flag=0;
                System.out.println();
                System.out.println("THE PRODUCTS AVAILABLE IN THE STORE ARE AS
                FOLLOWS.");
                System.out.println();
                // Getters used to get the product name and price of the product.
                for(int i=0;i<count;i++){
                System.out.println("PRODUCT " + (i+1) + " : " + items[i].getProductName() +
                "\t\t\tPRICE : " + items[i].getPriceOfProduct());
                }
                System.out.println();
                System.out.println("ENTER THE NAME OF THE PRODUCT YOU WANT TO BUY :
                ");
                String productName = keyboard.next();
                System.out.println();
                System.out.println("YOU ARE LOOKING FOR THE PRODUCT - " +
                productName);
                System.out.println();
                System.out.println("LET ME CHECK IF " + productName + " IS AVAILABLE IN
                THE STORE... ");
                // Loop to check availibilty of the product in the store.
                for(int i=0;i<count;i++){
                        String productFromFile = items[i].getProductName();
                        //Loop to compare the product name and the quantity(making sure
                        its more than 0).
                        if(productFromFile.equalsIgnoreCase(productName)          &&
                        (items[i].getQuantityOfProduct()>0)){
                                flag=1;
                                System.out.println();
                                System.out.println("YES. THE PRODUCT IS AVAILABLE.");
                                System.out.println();
```

```
                                System.out.println("WOULD YOU LIKE TO PURCHASE IT? (Enter
                                y for yes, n for no): ");
                                answer = keyboard.next();
                                if(answer.equals("y") || answer.equals("Y")){
                                        System.out.println("PLEASE WAIT. WE ARE
                                        PROCESSING YOUR REQUEST...");
                                        System.out.println();
                                        int newQuantity = items[i].getQuantityOfProduct();
                                        // updating the product info to the file
                                        items[i].setQuantityOfProduct(newQuantity-1);
                                        System.out.println("OK. THANKS FOR SHOPPING.");
                                        sum = sum + items[i].getPriceOfProduct();
                                        // getter to get the price of the product.
                                }
                                else
                                        break;
                        }
                }
                if(flag==0){
                        System.out.println("SORRY! THE PRODUCT IS NOT AVAILABLE IN THE
                        STORE.");
                }
                System.out.println();
                System.out.println("WOULD YOU LIKE TO PURCHASE ANOTHER
                PRODUCT?(Enter y for yes, n for no)");
                answer = keyboard.next();
        }while(answer.equals("Y") ||answer.equals("y"));

        System.out.println();
        System.out.println("YOUR COST OF SHOPPING IS = " + sum);
        System.out.println();
        System.out.println("THANK YOU FOR USING OUR SERVICES.");
        System.out.println("PLEASE WAIT FOR A MOMENT... WHILE WE REDIRECT YOU TO
        THE MAIN MENU.");
}

/* Loop for choice 7. This will write all the changes made to
 * object items to the file so that the changes done by the
 * user is not lost. It will also give the user an option to
 * display the final inventory and then exit.*/
if(choice==7){
        System.out.println();
        System.out.println("UPDATING THE FILE USED...");
        try{
                outputStream = new PrintWriter(new FileOutputStream("Software
                Store1.txt"));
                // I am not writing to the same file so that i don't lose any data.
        }
        catch(FileNotFoundException e){
                System.out.println("File Not Found.");
```

```
                        System.out.println("ERROR.");
                    }
                    // Code to write to the file "Software Store1.txt"
                    outputStream.println("Company Name\tProduct Name\tPrice\tQuantity");
                    for(int i=0;i<count;i++){
                        outputStream.println(items[i]);
                    }
                    outputStream.close();
                    System.out.println();
                    System.out.println("FINISHED FILE UPDATE.");
                    System.out.println();
                    System.out.println("DO YOU WANT TO PRINT THE INVENTORY?(Enter y for yes, n for
                    no)");
                    answer = keyboard.next();
                    if(answer.equals("Y") ||answer.equals("y")){
                        System.out.println();
                        System.out.println("Company Name\tProduct Name\tPrice\tQuantity");
                        for(int i=0;i<count;i++){
                            System.out.println(items[i]);
                        }
                    }
                    System.out.println();
                    System.out.println("THANK YOU FOR USING OUR SERVICES.");
                    System.out.println();
                    System.out.println("YOU ARE NOW EXITING FROM THE PROGRAM.");
                    System.exit(0);
                }
        }while(choice>=0 && choice<=7);
    }

}
```

End of Document