**Program 3**

***Due Date:*** Sunday, October 11, 11:55 pm

## *Problem:*

## You are to create a program for a holiday resort that rents vacation homes by the day at different rates throughout the year. The management also gives a 15% discount if the rental period is greater than 7 days. Renters must pay a $250 returnable deposit for each vacation home rented.

The rental rates are:

|  |  |  |
| --- | --- | --- |
| **Season** | **Months** | **Charge** |
| Spring | March, April, May | $200.00 |
| Summer | June, July, August | $300.00 |
| Fall | September, October, November | $250.00 |
| Winter | December, January, February | $100.00 |

***Sample Run (when has discount):*** (Items in bold represent user input.)

Welcome to Holiday Resort Vacation Home Rentals

Please enter customer information:

Enter first name: **Cathy**

Enter last name: **Holbrook**

Enter street address: **123 Main St**

Enter city: **Normal**

Enter state: **IL**

Enter zip code: **61761**

Enter phone number in form 9999999999: **3091239876**

Enter start date in form mm/dd/yyyy: **09/28/2015**

Enter number of rental homes: **2**

Enter number of days: **10**

Customer:

Cathy Holbrook

123 Main St

Normal, IL 61761

(309)123-9876

Rental cost: $ 5,000.00

Discount: $ 750.00

Deposit: $ 500.00

Total: $ 4,750.00

Thank you for renting from us.

Holiday Resort Vacation Home Rentals

239 E. Hwy 98

Cocoa Beach, FL 32540

(850)729-1000

***Sample Run (no discount)***

Welcome to Holiday Resort Vacation Home Rentals

Please enter customer information:

Enter first name: **Cathy**

Enter last name: **Holbrook**

Enter street address: **123 Main St**

Enter city: **Normal**

Enter state: **IL**

Enter zip code: **61761**

Enter phone number in form 9999999999: **3091239876**

Enter start date in form mm/dd/yyyy: **09/28/2015**

Enter number of rental homes: **1**

Enter number of days: **1**

Customer:

David Sikolia

102 University Drive

Normal, IL 61761

(309)123-9876

Rental cost: $ 250.00

Deposit: $ 250.00

Total: $ 500.00

Thank you for renting from us.

Holiday Resort Vacation Home Rentals

239 E. Hwy 98

Cocoa Beach, FL 32540

(850)729-1000

***Design:***

The classes should be placed in a package with the name edu.ilstu.it168.program3.<your ulid>

You will need to use the following classes for your program:

**VacationHomeRental class**

Keeps track of the information about a vacation home rental and handles calculations for the rental. It should include the following:

* Constants
  + 15 percent discount (used if the vacation home is rented for more than 7 days)
  + $250 returnable deposit
  + prices for the different seasons (see rental rates above)
* Instance variables
* number of days the vacation home is rented
* number of vacation homes rented
* rental date, entered and stored in the format mm/dd/yyyy
* Methods
  + constructor accepting values for all instance variables
  + calculateTotal – calculates the total cost for the rental. This is calculated by the cost of the rental(s) minus the discount amount plus the deposit.
  + calculateVacationHomeCost – calculates the cost of the vacation home based on the number of days, number of vacation homes rented, and the season.
  + calculateDiscount – calculates the discount
  + calculateDeposit – determines the deposit required based on $250 per vacation home rented.
  + determinePrice – determines the price for each rental based on month
  + determineDiscount – determines whether there should be a discount (rental for greater than 7 days). It returns the discount percent or zero if no discount should be given.
  + Getters and setters for all instance variables

**Customer class**

Keeps track of the customer name, mailing address, and phone information.

* Instance Variables
  + Variables for first and last names, street address, city, state, zip code, and phone.
* Methods
  + constructor with no arguments
  + constructor receiving all instance variables
  + formatLabel method that formats the customer or resort information. This should be placed in a String to be returned from the method. See the format in the Sample Run.
  + formatPhone method - The phone should be entered in the form xxxxxxxxxx and formatted for display to the form (xxx)xxx-xxxx
  + Getters and setters for all instance variables.
* You will use this class to create objects for both the resort and the customer. When an object is created for the resort, the name should be placed in the last name. You will need to add logic in formatLabel method to determine whether it is formatting for the resort or customer. For a resort object, the firstName will be null.

**VacationHomeInput class**

Handles all of the input from the user.

* Methods
  + readRentalOrder – this method should prompt and read all of the information for a rental. It should create and return a rental object. Use the prompts illustrated in the sample run.
  + readCustomer – this method should read all of the information for a customer. It should create and return a customer object.

**VacationHomeOutput** **class**

Handles all output except prompts which are in the input class.

* Methods (Use Sample Run for specifics)
  + displayGreeting – welcome to the customer.
  + displayReceipt – displays the cost of rental, discount (only display if the customer gets a discount), deposit, and total.
  + displayCustomer – displays the customer information as formatted in the formatLabel method.
  + displayGoodbye – thank you and store information formatted using the formatLabel method.

**VacationHomeDriver class**

The driver is the class with the main method. It should first greet the customer. Then it should call readRentalOrder and readCustomer to get the required information. Output should display the customer information, the receipt, and a polite goodbye.

You will need two instances of the Customer object. One for the resort – create the object and hard code the information stored in the object in the driver. The second one will be created when info about the customer is read from the user.

***Design Requirements***

* Create a class diagram for all classes except the driver.
* For the driver, write the algorithm using pseudocode.
* Test data and expected results form filled out.

***Submission:***

* Zip your .java files for all of the classes together into a file with your initials and Program 3. (Do not include the design documents.)
  + Example format: CJH-Program3.zip
* Zip the class diagrams, main algorithm, and test data into a file with your initials and Program 3 Design.
  + Example format: CJH-Program3Design.zip
* Upload the two zip files to ReggieNet. Be sure to also have everything stored in a Program 3 folder on your H: drive.

1. Suggestions some classes and methods. In class on Tuesday we discussed the purpose and give examples for the input and output classes that were suggested for this program. I think the following code snippet from a similar program will give you some ideas as to how these driver class and main method code may look. Be aware that your code in your main method shouldn't need to be any longer than 12-20 lines of code. This code should be quite concise because most of the work is being done in the other classes methods.

The example that I give is done by creating the object first and then passing the order object to the readTShirtOrder method to get input from the user and set it to variables of the order object. In your assignment you're being asked to call the readOrder type of method and the method will get customer input (import the Scanner class there) and create the order object by calling the constructor that takes all parameters (instead of using setters).

public static void main(String[] args) {

TShirtInput input = new TShirtInput();

TShirtOutput output = new TShirtOutput();

TShirtOrder order = new TShirtOrder();

Customer customer = new Customer();

...

output.displayMenu();

input.readTShirtOrder(order);

...

output.displayOrder...

}

2. Notice in the requirements that you are asked to create instructors that take all of the instance variables as parameters. You should be using these instead of the typical setters wherever you can. Using the instructors will minimize the number of lines of code as you won't have to call multiple setters in multiple places.

3. I had some questions about the methods called formatLabel and formatPhone. Think of these methods as specialized getter methods. Normally getter methods will just retrieve primitive data. These will retrieve the data with some formatting so that it will look nice when output. For example, the phone method called formatPhone will retrieve the phone number but will insert parentheses, spaces and a hyphen. If you need more clarification on this one please ask.

In this final message I have included code for the T-shirt ordering program that when used as an example during lecture. I haven't included every aspect of the program but I have included key elements that will help you understand the best way to do your current assignment program 3.

My final comment is to make sure that you include comments for each class and method. Commenting your code will be graded more critically from program 3 forward. You can see examples of properly commented methods in the following T-shirt code.

If you have further questions or need direction please email me directly.

Kevin Schaefer

---------------------------------

public class TShirtOutput

{

/\*\*

\* Displays the menu to the user

\*

\* @param price

\*/

public void displayMenu(double price)

{

System.out.printf("%6s%s\n\n", " ", "Super Bowl T-Shirts");

System.out.printf("%-25s $%.2f\n", "Seahawks T-shirts", price);

System.out.printf("%-25s $%.2f\n", "Broncos T-shirts", price);

System.out.printf("%-25s $%.2f\n\n\n", "Super Bowl T-shirts", price);

}

/\*\*

\* Prints the order receipt

\*

\* @param order

\*/

public void printOrderSummary(TShirtOrder order)

{

System.out.printf("\n\n%-10s%s\n\n", " ", "Order Summary");

System.out.printf("%-25s  %d\n", "Seahawks T-shirts", order.getNumSeahawks());

System.out.printf("%-25s  %d\n", "Broncos T-shirts", order.getNumBroncos());

System.out.printf("%-25s  %d\n", "Super Bowl T-shirts", order.getNumSuperBowl());

System.out.printf("\n%-25s $%6.2f", "Subtotal", order.calculateTShirtsCost());

System.out.printf("\n%-25s $%6.2f", "Tax ", order.calculateTax());

System.out.printf("\n%-25s $%6.2f", "Shipping Cost", order.getShippingCost());

System.out.printf("\n\n%-25s $%6.2f", "Total ", order.calculateTotalCost());

}

----------------------------

package edu.ilstu;

import java.util.Scanner;

/\*\*

\* Handles input for a T-shirt order and customer information

\*

\* @author ulid

\*

\*/

public class TShirtInput

{

Scanner keyboard = new Scanner(System.in);

/\*\*

\* Reads the number to order for each type of t-shirt

\*

\* @param order

\*/

public void readTShirtOrder(TShirtOrder order)

{

System.out.print("Enter the number of Seahawks T-Shirts to purchase:  ");

int numToOrder = keyboard.nextInt();

order.setNumSeahawks(numToOrder);

System.out.print("Enter the number of Broncos T-Shirts to purchase:  ");

numToOrder = keyboard.nextInt();

order.setNumBroncos(numToOrder);

System.out.print("Enter the number of Super-Bowl T-Shirts to purchase:  ");

numToOrder = keyboard.nextInt();

order.setNumSuperBowl(numToOrder);

//Read newline character

keyboard.nextLine();

}

/\*\*

\* Reads the customer information

\*

\* @param cust

\*/

public void readCustomer(Customer cust)

{

System.out.println("\n\nPlease enter shipping information:");

System.out.print("Enter first name:  ");

String firstName = keyboard.nextLine();

cust.setFirstName(firstName);

System.out.print("Enter last name:  ");

String lastName = keyboard.nextLine();

cust.setLastName(lastName);

...

System.out.print("Enter zip code:  ");

String zip = keyboard.nextLine();

cust.setZip(zip);

}

}

**public** String formatLabel(String firstName,String lastName,String address,String city,String state,String zipCode,String phoneNumber)

{

**if**(firstName==**null**)

System.***out***.print("Holiday Resort Vacation Home Rentals\n 239 E. Hwy 98\nCocoa Beach, FL 32540 \n (850)729-1000");

**return** String.*format*(firstName+"\t"+lastName+"\n"+address+city+",\t"+state+"\t"+zipCode+"\n"+phoneNumber);

}

System.***out***.printf("\n\nRental cost:\t$\t"+"%5.2",seasonalRate+"\n"+"%5.2",determineDiscount+"Deposit:\t"+"%5.2",RETURNABLE\_DEPOSIT+"\n\n"+"Total:\t"+"%5.2",total);