CSE201 Advanced Programming

Lab Assignment-02

IIIT-Delhi. 18th Sept 2020. Due by 11:59 pm on 21st Sept 2020

Syllabus: Interfaces, Inheritance, Polymorphism

This assignment is a take-home lab assignment. No extensions whatsoever will be provided. Any submission after the deadline will not be evaluated. If there is any ambiguity or inconsistency in a question, please seek clarification from the teaching staff. Please read the entire text below very carefully before starting its implementation.

Plagiarism: All submitted lab assignments are expected to be the result of **your individual effort.** You should never misrepresent someone else's work as your own. In case any plagiarism case is detected, it will be dealt as per IIITD plagiarism policy and without any relaxations:

https://www.iiitd.ac.in/sites/default/files/docs/education/AcademicDishonesty.pdf   Please note that you are not allowed to discuss the lab assignment's design/solution (e.g. classroom page discussions, etc.). Anyone who is found doing this will be treated as a plagiarism case. No excuses!

NOTE that we won't respond to any query which we feel can be avoided after reading the problem description carefully. We will ONLY respond to valid questions. Make sure you ask all your doubts in advance and not at the last minute.

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Image Source: https://bit.ly/35v8564

You are approached by a food delivery technology company, Zotato to design an application. This application primarily is a platform for restaurants and diners to connect facilitated by food

delivery executives. You must employ OOP principles, e.g., interfaces, inheritance, polymorphism, whichever provides the best and most appropriate design.

The application needs to serve the following features:

1) Customers are generally charged **40/-** delivery charge per order. There are additionally, two special categories:
   - **Elite Customers** - **Free** delivery (50/- off on bill value greater than 200/- after restaurant discount)
   - **Special Customers** - **20/-** delivery charge per order (25/- off on bill value greater than 200/- after restaurant discount)
   (Note: Apply restaurant discount first on bill value, then apply customer discount)

2) Restaurants do not generally have overall bill discounts. However there are additionally, two special categories.
   - **Fast food** - Has an option to discount overall bill value
   - **Authentic restaurants** - Has the option to discount overall bill value + 50/- off on all orders (if bill is greater than 100/- after overall bill value discount)

3) Each food item must have a unique ID for ease of selection. Each food item can have their own individual discounts which must be taken into account when entering a food item.

4) Restaurants need to pay 1% of the total bill value (after discounts) to the food tech company (Assume Restaurants have surplus money to pay)

5) Owners must add categories to each food item so that customers can have clarity. The categories consist of : "Starter", "Main Course", "Dessert", "Beverage".

6) Customers start with Rs. 1000/- in their account, which will be called the wallet. (For sake of simplicity, assume this is the maximum which a customer can spend, no more top-up)

7) There is a reward scheme for customers as follows -
   - **Fast food** - 10 points per 150/- spent
   - **Authentic restaurants** - 25 points per 200/- spent
   - **Rest** - 5 points per 100/- spent
   (All the above rewards are applicable on total order value after all discounts, 1 point = 1 rupee)

8) The reward points must be added:
   - **Customer -** To the rewards account of the customer.
   - **Restaurant -** The same points must also be added to the restaurant (Restaurants don't use the reward points, it is just for rating purpose)

9) When a customer makes a purchase, the amount must be deducted from the rewards account first and then from the wallet.

10) A customer may add food items from only one restaurant in a single order.

11) Customers must always add items to cart, be shown the order final total before placing the order.

For the demo of the working of the application, you are expected to add at least 5 restaurants and customers each (Hardcode). Include different categories mentioned above, to demonstrate everything.

1. Your application must have a parent menu to navigate all functionalities. The first two menu options should pertain to **restaurant** owner login and **customer** login. (<u>Note: They are both users according to the application, and have some common functionalities</u>) They should list all user profiles from which the user can pick the account to log in.

2. Option 3 should display user details of selected restaurant or customer details. (Give option to choose between the two and the subsequent User)
   a. Customer - Name (Category, if any), address, account balance
   b. Restaurant - Name, address, number of orders taken

3. Option 4 - Print details of total charges collected from restaurants (as transaction fee) and delivery charges from customers

4. Option 5 - Exit the application

Restaurant queries -
1) **Add food items -** To add item details - ID (generated by application), Name, price, quantity, discounts if any, Print their details
2) **Edit food items** - Modify any of the above-mentioned item details - Name, price, quantity, discounts
3) **Print rewards -** To print the number of reward points claimed by customers
4) **Discount overall bill value -** Applicable for Authentic and fast-food restaurants (Input is taken as integer, which is percentage discount, say 1 means 1% discount)
5) **Exit**

Customer queries -
1) **Selecting**: Select using restaurant name. Display all the restaurants so that the user can choose one. The customer after selecting gets a list view of the items under that restaurant. Then the customer can choose the item by its code and quantity. The

customer can add it to their cart or exit the option. Print success messages or appropriate error messages.

2) **Checkout option**: Items have to be checked out altogether. If you cannot check out the items (insufficient balance), give an option to the user to delete any item and then let the user check out the items by showing the total amount of the order.

3) **Print reward**: Option to see how much reward has been won.

4) **List recent orders**: Display the last 10 orders in the following manner
"Bought item: " <item name> ", quantity: " <item quantity> " for Rs " <item price> " from Restaurant " <Restaurant Name> " and Delivery Charge: " <amount>

5) **Exit**

Notes:
1) You are allowed to use inbuilt libraries and data structures.
2) Error handling is not required for input data type, or insufficient parameters.

Input Example:

```
Welcome to Zotato:
   1) Enter as Restaurant Owner
   2) Enter as Customer
   3) Check User Details
   4) Company Account details
   5) Exit
1
Choose Restaurant
   1) Shah (Authentic)
   2) Ravi's
   3) The Chinese (Authentic)
   4) Wang's (Fast Food)
   5) Paradise
1
Welcome Shah
   1) Add item
   2) Edit item
   3) Print Rewards
   4) Discount on bill value
   5) Exit
1
Enter food item details
Food name:
Biryani
item price:
150
```

item quantity:
10
item category:
MainCourse
Offer:
0
1 Biryani 150 10 0% off MainCourse
Welcome Shah
   1) Add item
   2) Edit item
   3) Print Rewards
   4) Discount on bill value
   5) Exit
1
Food name:
Gobi 65
item price:
120
item quantity:
10
item category:
Starter
Offer:
5
2 Gobi 65 120 10 5% off Starter
Welcome Shah
   1) Add item
   2) Edit item
   3) Print Rewards
   4) Discount on bill value
   5) Exit
2
Choose item by code
1 Shah - Biryani 150 10 0% off MainCourse
2 Shah - Gobi 65 120 10 5% off Starter
1
Choose an attribute to edit:
   1) Name
   2) Price
   3) Quantity
   4) Category
   5) Offer
2

Enter the new price - 160
1 Shah - Biryani 160 10 0% off MainCourse
Welcome Shah
   1) Add item
   2) Edit item
   3) Print Rewards
   4) Discount on bill value
   5) Exit
3
Reward Points: 0
Welcome Shah
   1) Add item
   2) Edit item
   3) Print Rewards
   4) Discount on bill value
   5) Exit
4
Enter offer on total bill value - 1
Welcome Shah
   1) Add item
   2) Edit item
   3) Print Rewards
   4) Discount on bill value
   5) Exit
5
Welcome to Zotato:
   1. Enter as Restaurant Owner
   2. Enter as Customer
   3. Check User Details
   4. Company Account details
   5. Exit
2
   1. Ram (Elite)
   2. Sam (Elite)
   3. Tim (Special)
   4. Kim
   5. Jim
2
Welcome Sam
Customer Menu
1) Select Restaurant
2) checkout cart
3) Reward won

4) print the recent orders
5) Exit
1
Choose Restaurant
   1) Shah (Authentic)
   2) Ravi's
   3) The Chinese (Authentic)
   4) Wang's (Fast Food)
   5) Paradise
1
Choose item by code
1 Shah - Biryani 160 10 0% off MainCourse
2 Shah - Gobi 65 120 10 5% off Starter
2
Enter item quantity -
2
Items added to cart
Welcome Sam
Customer Menu
1) Select Restaurant
2) checkout cart
3) Reward won
4) print the recent orders
5) Exit
2
Items in Cart -
2 Shah - Gobi 65 - 120 - 2 - 5% off
Delivery charge - 0/-
Total order value - INR 175.72/-
   1) Proceed to checkout
1
2 items successfully bought for INR 175.72/-
Welcome Sam
Customer Menu
1) Select Restaurant
2) checkout cart
3) Reward won
4) print the recent orders
5) Exit
5
Welcome to Zotato:
   1) Enter as Restaurant Owner
   2) Enter as Customer

3) Check User Details

   4) Company Account details

   5) Exit
5
------------End of Sample Input case-------------

-----More Test Case to clarify other cases (Based on data from previous test case---------
Welcome to Zotato:
   1) Enter as Restaurant Owner

   2) Enter as Customer

   3) Check User Details

   4) Company Account details

   5) Exit
3
   1) Customer List

   2) Restaurant List
1
   1. Ram

   2. Sam

   3. Tim

   4. Kim

   5. Jim
2
       Sam(Elite), Pune, 824.28/-
Welcome to Zotato:
   1) Enter as Restaurant Owner

   2) Enter as Customer

   3) Check User Details

   4) Company Account details

   5) Exit
4
Total Company balance - INR 1.77/-
Total Delivery Charges Collected - INR 0/-
Welcome to Zotato:
   1) Enter as Restaurant Owner

   2) Enter as Customer

   3) Check User Details

   4) Company Account details

   5) Exit
1
Choose Restaurant

```
   1) Shah (Authentic)
   2) Ravi's
   3) The Chinese (Authentic)
   4) Wang's (Fast Food)
   5) Paradise
1
Welcome Shah
   1) Add item
   2) Edit item
   3) Print Rewards
   4) Discount on bill value
   5) Exit
3
Reward Points - 0
Welcome Shah
   1) Add item
   2) Edit item
   3) Print Rewards
   4) Discount on bill value
   5) Exit
4
Enter discount on bill value - 10
Welcome Shah
   1) Add item
   2) Edit item
   3) Print Rewards
   4) Discount on bill value
   5) Exit
5
Welcome to Zotato:
   1) Enter as Restaurant Owner
   2) Enter as Customer
   3) Check User Details
   4) Company Account details
   5) Exit
Choose Restaurant
   1) Shah (Authentic)
   2) Ravi's
   3) The Chinese (Authentic)
   4) Wang's (Fast Food)
   5) Paradise
2
Welcome Ravi
```

1) Add item
2) Edit item
3) Print Rewards
4) Discount on bill value   **//This option won't be useful for regular restaurants**
5) Exit
1
Food name:
Gobi 95
item price:
90
item quantity:
10
item category:
Starter
Offer:
5
3 Gobi 95 - 90 - 10 - 5% - Starter
Welcome Ravi
1) Add item
2) Edit item
3) Print Rewards
4) Discount on bill value
5) Exit
5
Welcome to Zotato:
1) Enter as Restaurant Owner
2) Enter as Customer
3) Check User Details
4) Company Account details
5) Exit
2
1. Ram (Elite)
2. Sam (Elite)
3. Tim (Special)
4. Kim
5. Jim
4
Welcome Kim
Customer Menu
1) Select Restaurant
2) checkout cart
3) Reward won

4) print the recent orders

5) Exit

1

Choose Restaurant

   1) Shah (Authentic)

   2) Ravi's

   3) The Chinese (Authentic)

   4) Wang's (Fast Food)

   5) Paradise

2

Choose item by code

3 - Gobi 95 - 90 - 10 - 5% - Starter

3

Enter item quantity -

5

Items added to cart

Welcome Kim

Customer Menu

1) Select Restaurant

2) checkout cart

3) Reward won

4) print the recent orders

5) Exit

2

Items in Cart -

3 Ravi's - Gobi 95 - 90 - 5 - 5%

Delivery charge - 40/-

Total order value - 467.5/-

  1) Proceed to checkout

1

5 items successfully bought for INR 467.5/-

Welcome Kim

Customer Menu

1) Select Restaurant

2) checkout cart

3) Reward won

4) print the recent orders

5) Exit

3

Total Rewards - 20

Welcome Kim

Customer Menu

1) Select Restaurant

2) checkout cart

3) Reward won

4) print the recent orders

5) Exit

5

Welcome to Zotato:

   1) Enter as Restaurant Owner

   2) Enter as Customer

   3) Check User Details

   4) Company Account details

   5) Exit

5

-----------------------End of Sample Input Case---------------------