

# CSE201 Advanced Programming

## Lab Assignment 02

IIIT-Delhi. 16th August 2019. Due by 11:59pm on 18th Aug 2019

### Topics Covered: Interfaces and Polymorphism

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

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Please note that you are not allowed to discuss the design/solution of the lab assignment (e.g. classroom page discussions etc.). Anyone who is found doing this will be treated as a plagiarism case. No excuses!

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You are interviewing for an E-commerce start-up known as Mercury Inc. You have passed the initial two rounds of the process. In the third round, your task is to build a small-scale e-commerce application. The aim of the application is to connect merchants with customers and make the ensuing transaction hassle-free. You must use OOP concepts, especially interfaces and polymorphism while building the application.

The company has a few demands which have to be met:

- 1) The company gets a 1% transaction fee (0.5% from the merchant and 0.5% from the customer ) for every transaction.
- 2) Each merchant can sell at most 10 unique items at a time. ( Quantity doesn't matter )
- 3) Each item has a unique code and access to it is via its code.
- 4) There is a Reward scheme in the app:
  - Every 5th purchase of a customer gets him a reward of Rs 10 ( This Reward has to go into a separate rewards account and not the main account of the customer).
  - A merchant gets an extra slot for every Rs 100 he contributes to the company's account (via the transaction fees mentioned above).
- 5) A customer can add items from multiple merchants into his cart.
- 6) Customers can buy an item directly or add it to his cart. Each Customer has Rs. 100 in his main account when the program starts.
- 7) Whenever a customer buys/checks out an item, money is first deducted from his main account and then from his rewards account.
- 8) The merchant has to add a category for each of his items so that the user can search for items based on the categories.
- 9) The merchant can introduce the following offers on any of his items:
  - Buy one get one free ( if quantity is one then this offer is effectively nullified)
  - 25% off

As you have limited time to finish this application, you are allowed to make 5 default user accounts each for merchants and customers in the company when the program starts.

The initial menu should have five options; the first two are the log in as a **Merchant** or **Customer**. On the selection of one of the above options, you have to display the user id and name of all the available merchants or customers ( according to the initial choice ). The user can then choose which account to log into by typing in the user id.

The menu should have the third option to view details of any user account ( Display the name and user id as in the previous options. The query for viewing detail should be M or C ( Merchant or Customer ) followed by the id of the user. ).

*Details for the merchant:* Name, Address, Total contribution to company's account

*Details for the customer:* Name, Address, Number of orders placed via the application

The fourth option is to see the account balance of the company.

The fifth option is to exit the application.

#### **Queries for Merchant:**

- 1) **Add items for a merchant:** Print item details (id,name,price,quantity,category,offer if applied) on successful addition else print an error message.
- 2) **Edit items for a merchant:** The merchant should enter the code for his particular item and then he can edit the price and quantity of the item. Print edited item details.
- 3) **Searching:** Can only search by categories to check his own and competitor's pricing for items in that category. Display all the categories so that the user can choose one. Print a list view of the details of the items under that category.
- 4) **Add offers for an item belonging to a merchant:** The merchant should enter the code for his particular item and then he can add an offer to that item. Print details of the item.
- 5) **Print reward:** Option to see how much slots have been awarded from the reward scheme.
- 6) **Exit.**

#### **Queries for Customer:**

- 1) **Searching:** Search using categories. Display all the categories so that the user can choose one. The customer after searching by the category gets a list view of the items under that category. Then the customer can choose the item by its code and quantity. The customer has to choose a method of transaction: 1. a choice of buying an item, 2. adding it to cart, 3. exiting the current option. Print success messages or appropriate error messages for the first 2 options.
- 2) **Checkout option:** Items have to be checked out in a FIFO manner. If you cannot check out a particular item ( *keeping in mind the quantity, account balance, offer* ) then display an error message (e.g. out of stock, out of money) and exit current option, else display success messages and exit current option. Also, all the items before that particular item ( in case of error ) have to be checked out.
- 3) **Print reward:** Option to see how much reward has been won.

- 4) **List recent orders:** Display the last 10 transactions in the following manner " Bought item "item name" quantity: "item quantity" for Rs "item price" from Merchant: "Merchant Name".
- 5) **Exit.**

**Notes:**

- 1) Item details are the item unique code, item name, price, available quantity, offer, and category in that order.
- 2) You are allowed to use inbuilt libraries and data structures.
- 3) Error handling is not required.

**Input Sample:**

**Welcome to Mercury**

**1) Enter as Merchant**

**2) Enter as Customer**

**3) See user details**

**4) Company account balance**

**5) Exit**

1

**choose merchant**

**1 jack**

**2 john**

**3 james**

**4 jeff**

**5 joseph**

1

**Welcome jack**

**Merchant Menu**

**1) Add item**

**2) Edit item**

**3) Search by category**

**4) Add offer**

**5) Rewards won**

**6) Exit**

1

**Enter item details**

**item name:**

lays

**item price:**

20

**item quantity:**

5

**item category:**

chips

**1 lays 20 5 None chips**

// If there is no offer available on the item, then it shows None

**Welcome jack**

**Merchant Menu**

**1) Add item**

**2) Edit item**

**3) Search by category**

**4) Add offer**

**5) Rewards won**

**6) Exit**

2

**choose item by code**

**1 lays 20 5 None chips**

1

**Enter edit details**

**item price:**

25

**item quantity:**

5

**1 lays 25 5 None chips**

**Welcome jack**

**Merchant Menu**

**1) Add item**

**2) Edit item**

**3) Search by category**

**4) Add offer**

**5) Rewards won**

**6) Exit**

3

**Choose a category**

**1) chips**

1

**1 lays 25 5 None chips**

**Welcome jack**

**Merchant Menu**

**1) Add item**

**2) Edit item**

**3) Search by category**

**4) Add offer**

5) Rewards won

6) Exit

4

choose item by code

1 lays 25 5 None chips

1

choose offer

1) buy one get one

2) 25% off

2

1 lays 25 5 25% off chips

Welcome jack

Merchant Menu

1) Add item

2) Edit item

3) Search by category

4) Add offer

5) Rewards won

6) Exit

6

Welcome to Mercury

1) Enter as Merchant

2) Enter as Customer

3) See user details

4) Company account balance

5) Exit

2

choose customer

1 ali

2 nobby

3 bruno

4 borat

5 aladeen

1

Welcome ali

Customer Menu

1) Search item

2) checkout cart

3) Reward won

4) print latest orders

5) Exit

1

Choose a category

**1) chips**

**1**

**choose item by code**

**1 lays 25 5 25% off chips**

**Enter item code**

**1**

**Enter item quantity**

**3**

**Choose method of transaction**

**1) Buy item**

**2) Add item to cart**

**3) Exit**

**1**

**Item Successfully bought**

**Welcome ali**

**Customer Menu**

**1) Search item**

**2) Checkout cart**

**3) Reward won**

**4) Print latest orders**

**5) Exit**

**4**

**Bought item lays quantity: 3 for Rs 75 from Merchant jack**

**Welcome ali**

**Customer Menu**

**1) Search item**

**2) Checkout cart**

**3) Reward won**

**4) Print latest orders**

**5) Exit**

**5**

**--End of sample test--**