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Object-Oriented Programming with Java

Project Specification

Project Extension 1

Complete the following extensions to the current project:

1. For the classes Item and Table make sure you use a static int field for the incremental ID of the objects of these classes.
2. Introduce inheritance in the project design with the following:
 - a. Classes inheriting from Item
 - i. Class ItemWithDiscount which has an additional feature called Discount. The amount is inserted periodically by the manager.
 - ii. Class ItemChristmas which has an additional feature more than ItemWithDiscount called DiscountChristmas. Let the manager define the amount of DiscountChristmas. The overall discount is calculated as Discount + DiscountChristmas.
 - iii. Class ItemsInOffer which has an additional feature more than Item called BuyMorePayLess. Let the manager define this, for example if you buy three you pay two. (Hint: use two parameters for this)

Define the following methods in all classes:

calculateDiscount() : Calculate the discount for each of these classes
PrintInfo() : Print all the information of the Item

- b. Classes inheriting from Table
 - i. Class TableFidelity, for loyal customers, with an additional feature called Points which is the accumulation of points for the customer. 10 Euro count for 1 point. Every 100 points, the customer gets a bonus of 50 Euro.
 - ii. Class TableCompany for a certain group of users belonging to the company. This table has an additional feature called NumberOfTimesServed which is the

number of times the employees of the company have been served. Every 300 different items there is a table free of charge with value not greater than 100 Euros.

- iii. Class TableEmployee which is reserved to Employees of the bar/restaurant. Each of these has an additional feature called Amount. If employees in more tables reach the amount of 500 Euros, they get a bonus in their salary of 50 euros.

c. User class:

The class User has:

- ID
- Username
- Password
- Address
- PhoneNumber

d. Customer class

A customer is a User. There are these types of customers:

- i. SimpleCustomer
 1. No bonus!
- ii. LoyalCustomer
 1. The customer gets a bonus of 50 Euro every 100 points
- iii. CompanyCustomer
 1. The company gets a bonus of 100 Euros every 300 different items served to employees of the company.
- iv. CustomerEmployee
 1. Get a bonus in their salary of 50 euros if they spend the amount of 500 Euros

Classes inheriting from User:

- i. Waiter: has an additional feature to User called InternalPhoneNumber
- ii. Manager: has an additional feature more than the user called InternalPhoneNumber.

e. Waiter class

- i. Waiter has these fields: wagePerHour and hoursOfWork.
- ii. hoursOfWork is calculated based on the first login time and the last logout time of the day.
- iii. Bonus is calculated as follows: for every hour overtime a bonus of 5 euro is given.

Define the following methods in all classes:

CalculateBonus() : Calculate the bonus for each of these classes

PrintInfo() : Prints all the information of the specific user

3. Define a Payable interface and make the classes for tables and internal employees implement this interface by defining a method that calculates the payment to be done.
4. Handle input correctness and check the validity of the input types, strings, int, etc with exceptions. (Lesson 9)
5. Use ArrayList within BarRestaurant class to keep all the Tables being currently served. Handle all operations polymorphically.
6. Use ArrayList within BarRestaurant class to keep all the Tables that have been already served and paid. Handle all operations polymorphically.
7. Use ArrayList within Table to keep all the items of the Table.
8. Use ArrayList within BarRestaurant class to keep all the users currently logged in the system and that are currently serving or being served.
9. Define polymorphically an operator that will permit to the manager at the end of the day to:
 - a. Compute the overall amount for each of the kinds of the tables.
 - b. Compute the overall amount of bonus accumulated for each of the kinds of customers
 - c. Compute the overall number of each kind of item

GOOD LUCK AND HAVE FUN!