COMSATS University Islamabad, Lahore Campus

Assignment No. 03 (Theory)

Course : Object Oriented Programming **Class: BSCS -A**

Due Date : 1-04-2020 **Marks : 30**

Question No. 1 (10 Marks)

Define a class named Payment that contains an instance variable of type double that stores the amount of the payment and appropriate accessor and mutator methods. Also create a method named paymentDetails that outputs an English sentence to describe the amount of the payment.

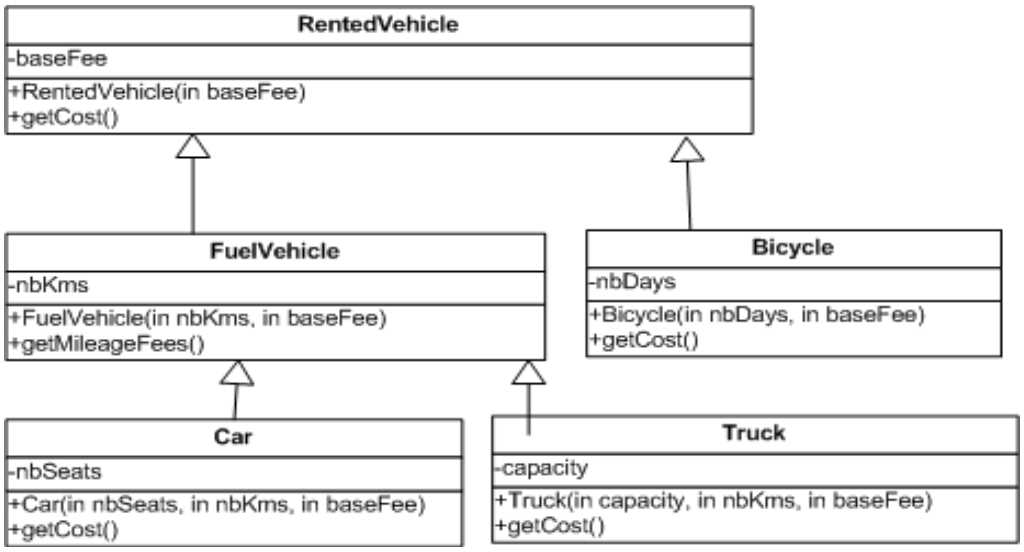
Next, define a class named CashPayment that is derived from Payment. This class should redefine the paymentDetails method to indicate that the payment is in cash. Include appropriate constructor(s).

Define a class named CreditCardPayment that is derived from Payment. This class should contain instance variables for the name on the card, expiration date, and credit card number. Include appropriate constructor(s). Finally, redefine the paymentDetails method to include all credit card information in the printout.

Create a main method that creates at least two CashPayment and two CreditCardPayment objects with different values and calls paymentDetails for each.

Question No. 2: **(20 Marks)**

Consider the following inheritance hierarchy and description, write a complete program that implements the required functionality as per description**.**



1. **A class RentedVehicle that has:**

- One private instance variable baseFee of type double
- One constructor to initialize the instance variable
- One instance method getCost () that returns the base fee

2. **A subclass FuelVehicle that :**

- has one additional private instance variable nbKms indicating the total number of kilometers traveled.
- one constructor to initialize the instance variables.
- one instance method getMileageFees to return the fees due to mileage based on the following:

  If nbKms < 100 mileagefees=0.2*nbkms

  If nbKms >= 100 and nbKms<= 400 then mileagefees=0.3*nbkms

  If nbKms>400 mileagefees=0.3 times 400 plus 0.5 times the extra kilometers above 400.

3. **A Car class which is a subclass of FuelVehicle that :**

- has one additional private instance variable nbSeats
- has one constructor to initialize the instance variables
- overrides getCost method by adding nbseats*baseFee to mileageFees
- accessors

4. **A Truck class which is a subclass of FuelVehicle that:**

- has one private instance variable capacity
- has one constructor to initialize the instance variables
- overrides getCost method by adding baseFee*capacity to mileageFees

5. **A Bicycle class that extends RentedVehicle that:**

- has one additional private instance variable nbDays indicating the number of days it is rented.
- has one constructor to initialize the instance variables
- overrides getCost method to return baseFee * nbDays
- accessors

Write an driver class that generates one object for each Car, Truck, and a Bicycle classes polymorphically, by assigning sub class object to super class reference. In this regard, you need to create an array of ***RentedVehicles*** class and store these objects in that array. Now, invoke **getCost()** method of Car, Truck and Bicycle classes in order to print the cost detail of each class.