Computer Programming Paradigm Lab
Lab Experiment No 2

Roll No.___ Batch_____

Aim: Implement Inheritance

Problem Statement

Write the code to implement the concept of inheritance for Vehicles. You are required to implement inheritance between classes. There would be 3 classes - one superclass and two sub classes. Vehicle is the super class, whereas Bus and Truck are subclasses of Vehicle class.

Detailed description of **Vehicle (Super class):**

The class Vehicle must have following attributes (private):

1. Vehicle model
2. Registration number
3. Vehicle speed (km/hour)
4. Fuel capacity (liters)
5. Mileage (kilometers/liter)

The Vehicle class must have following functions:

1. Parameterized constructor that will initialize all the data members with the given values.
2. Getters and Setters for each data member that will get and set the values of data members of class.
3. A function ***fuelNeeded()*** that will take ***distance (in kilometer)*** as an argument. It will calculate the amount of fuel needed for the given distance and will return the value of fuel needed for given distance. You can use the attributes '*Mileage'* defined within the above Vehicle class to determine the fuel needed for the given distance. You are required to implement this functionality by yourself.
4. A function ***distanceCovered()*** that will take ***time*** (in hours) as an argument. It will calculate the distance for the given time and speed and returns the value of distance. The formula to calculate speed is given as **speed = distance/time**. You can use this formula to calculate the distance.
5. A ***display()*** function to display all details of the Vehicle.

Detailed description of **Truck (Sub class):**

The class Truck must have following attribute (private):

Cargo weight limit (Kilo grams)

The above class must have following functions:

1. Parameterized constructor that will initialize all data members with the given values.
2. Getters and setters for each data member that will get and set the values of data members of class.
3. It must override the ***display()*** function of Vehicle and display the details of the Truck object.

Detailed description of **Bus (Sub class):**

The class Bus must have following attribute (private):

No of passengers

The above class must have following functions:

1. Parameterized constructor that will initialize all the data members with given values.
2. Getters and setters that will get and set the value of each data member of class.
3. It must override the ***display()*** function of Vehicle and display the details of the Truck object.

In main function, perform the following:

- Create an instance of class Truck and initialize all the data members with proper values.
- Create an instance of class Bus and initialize all the data members with proper values.
- Now, call **fuelNeeded*()***, ***distanceCovered()*** and ***display()*** functions using objects of these classes.

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Theory:

1. What is inheritance? What is it's avantage.
2. Discuss with examples, the implications of deriving a class from an existing class by the private, public and protected access specifiers.
3. When Constructors and Destructors are executed, in base and consecutive derive classes?
4. How is overriding different from overloading?

Program: code

Output: Snapshot of output