1 Implement a class named 'Car' which satisfies the following criteria.

· The car is fuel driven and it has a fuel efficiency measured in litres/km

· Initially a certain amount of fuel is left in the tank.

· Use a constructor to calculate the fuel efficiency.

· Create a method called 'drive()' to simulate the driving of the car for some distance so that the fuel level is dropped by some value.

· Crate methods for the following:

i) getFuelInTank() – Should return the amount of fuel in the tank in litres.

ii) pumpFuel() – To add fuel to the tank

iii) fuelLeft() – Should indicate the remaining amount of fuel in litres. Note: Assume a value to indicate the maximum capacity of the fuel tank and the distance travelled should be within this limit. You may need an initial validation before the car is driven.

2. Write a tester method named 'fuelEffiencyTester()' to test all methods / constructors in your application and provide an informative output.

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1 What is the difference between exception and error

2 What are the ways to handle exceptions? Describe them with coding examples

3 What is the use of finally block

4 What is the difference between throw and throws? Explain with coding examples

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1) Explain dynamic method dispatch with appropriate examples

2) How method overriding helps to implement runtime polymorphism? Explain with coding examples

3) What is method overloading? Explain with how it helps to achieve compile time polymorphism

4) Create a parent Animal class with attribute **kind** and method **cry()** with kind as parameter

1. Write three specific subclasses Cat class, Dog class, Sheep class
   Override the cry() method in the parent class, with the output information like (miao, bhaw, behh).
2. Write a test class that first generates a 5-length array of parent objects, then iterates through the array to store the data in turn, setting the storage rules to:
   a) Randomly produce a positive integer of 0-2 at a time
   b) If the value is 0, an object of Cat class is generated and stored in the array
   c) If the value is 1, an object of the Dog class is generated and stored in the array
   d) If the value is 2, an object of Sheep class is generated and stored in the array
   The last loop outputs the array members and calls the cry() method separately.

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1) Explain the difference between abstraction and encapsulation?

2) Explain what are the differences and usage of interfaces and abstract classes

3) Write a program to calculate the area of a rectangle, a square and a circle. Create an abstract class **Shape** with three abstract methods namely **RectangleArea** taking two parameters, **SquareArea** and **CircleArea** taking one parameter. The parameters of **RectangleArea** are its width and height, that of **SquareArea** is its side and that of **CircleArea** is its radius.

   Now create another class **Area** containing all the three methods **RectangleArea**, **SquareArea** and **CircleArea** for printing the area of rectangle, square and circle respectively. Create an object of class **Area** and call all the three methods. **(Area of circle is $\pi r2$, π=3.14)**

4) Explain these reserved words and methods
   - this, super, extends, finalize, implements, try-catch