Lab_task

Intake 53/1

1. You are designing a system where different types of vehicles have their own way of starting. Create a parent class Vehicle with a method start(). Create subclasses Car and Bike that override the start() method. Write a program to demonstrate dynamic method dispatch when calling start() using a Vehicle reference.

2. Suppose you are creating a simulation of animal sounds. Define a class Animal with a method makeSound(). Create subclasses Dog and Cat that override makeSound(). Demonstrate dynamic method dispatch by calling makeSound() using an Animal reference.

3. You are developing an e-commerce payment system. Create a class Payment with a method pay(). Create subclasses CreditCardPayment and PayPalPayment that override pay(). In the main() method, use a Payment reference to demonstrate runtime polymorphism.

4. Design a class hierarchy for shapes. Create an abstract class Shape with a method draw(). Create subclasses Circle and Rectangle that override draw(). Write a program to call draw() on a Shape reference pointing to different objects.

5. In a company, different employees have different salary structures. Create a class Employee with a method calculateSalary(). Subclass FullTimeEmployee and PartTimeEmployee should override calculateSalary(). Demonstrate dynamic method dispatch in the main() method using an Employee reference.

6. An abstract class called **Marks** is needed to calculate the percentage of marks earned by students A in three subjects (with each subject out of 100) and student B in four subjects (with each subject out of 100). This class must contain the abstract method "getPercentage," which two other classes, "A" and "B," will inherit. The method "getPercentage," which provides the percentage of students, is shared by classes "A" and "B."
The constructor of class 'A' will accept the marks obtained in three subjects as its parameters and the constructor of class 'B' will accept the marks obtained in four subjects as its parameters. To test the implementation, objects for both the classes need to be created and the percentage of marks for each student should be printed.