

1) Implement a Shape class with method area(), and override it in Circle, Rectangle.

```
class Shape {  
    // Method to be overridden  
    public double area() {  
        return 0.0;  
    }  
}  
  
// Circle class  
class Circle extends Shape {  
    double radius;  
  
    Circle(double radius) {  
        this.radius = radius;  
    }  
  
    @Override  
    public double area() {  
        return Math.PI * radius * radius;  
    }  
}  
  
// Rectangle class  
class Rectangle extends Shape {  
    double length, width;  
  
    Rectangle(double length, double width) {  
        this.length = length;  
        this.width = width;  
    }  
  
    @Override  
    public double area() {  
        return length * width;  
    }  
}
```

```

    }
}

public class Main {

    public static void main(String[] args)

        Shape shape1 = new Circle(5.0);

        Shape shape2 = new Rectangle(4.0, 6.0);    System.out.println("Area of Circle: " +
shape1.area());

        System.out.println("Area of Rectangle: " + shape2.area());

    }
}

```

Output

```

Area of Circle: 78.53981633974483
Area of Rectangle: 24.0

=== Code Execution Successful ===

```

2) Create one parent class Vehicle, and two child classes Car and Bike.

```

    class Vehicle {

        void start() {

            System.out.println("Vehicle is starting...");

        }

    }

    class Car extends Vehicle {

        void drive() {

            System.out.println("Car is driving...");

        }

    }
}

```

```

class Bike extends Vehicle {
    void ride() {
        System.out.println("Bike is riding...");
    }
}

public class Main {
    public static void main(String[] args)
    {
        Car myCar = new Car();
        myCar.start();
        myCar.drive();    System.out.println();

        Bike myBike = new Bike();
        myBike.start();
        myBike.ride();
    }
}

```

Output

```

Vehicle is starting...
Car is driving...

```

```

Vehicle is starting...
Bike is riding...

```

```

=== Code Execution Successful ===

```

3) Create a class Employee with fields id, name, and salary. Write a method to display employee information. Create multiple employee objects and call the method.

```

class Employee {
    int id;

```

```
String name;

double salary;

public Employee(int id, String name, double salary) {

    this.id = id;

    this.name = name;

    this.salary = salary;

}

public void displayInfo() {

    System.out.println("Employee ID: " + id);

    System.out.println("Name      : " + name);

    System.out.println("Salary   : " + salary);

    System.out.println("-----");

}

}

public class Main {

    public static void main(String[] args) {

        Employee emp1 = new Employee(101, "Ashwin", 45000);

        Employee emp2 = new Employee(102, "Sneha", 52000);

        Employee emp3 = new Employee(103, "Ravi", 60000);

        emp1.displayInfo();

        emp2.displayInfo();

        emp3.displayInfo();

    }

}
```

Output

Employee ID: 101

Name : Ashwin

Salary : 45000.0

Employee ID: 102

Name : Sneha

Salary : 52000.0

Employee ID: 103

Name : Ravi

Salary : 60000.0

=== Code Execution Successful ===

4) Write a program to create a class Calculator with methods to perform addition, subtraction, multiplication, and division. Create an object and perform all operations.

```
class Calculator {  
  
    // Method for addition  
    public double add(double a, double b) {  
        return a + b;  
    }  
  
    // Method for subtraction  
    public double subtract(double a, double b) {  
        return a - b;  
    }  
}
```

```
// Method for multiplication
public double multiply(double a, double b) {
    return a * b;
}

// Method for division
public double divide(double a, double b) {
    if (b != 0) {
        return a / b;
    } else {
        System.out.println("Error: Division by zero");
        return 0;
    }
}

}

public class Main {
    public static void main(String[] args) {
        Calculator calc = new Calculator();
        double num1 = 20;
        double num2 = 5;
        System.out.println("Addition: " + calc.add(num1, num2));
        System.out.println("Subtraction: " + calc.subtract(num1, num2));
        System.out.println("Multiplication: " + calc.multiply(num1, num2));
        System.out.println("Division: " + calc.divide(num1, num2));
    }
}
```

Output

▲ Addition: 25.0

Subtraction: 15.0

Multiplication: 100.0

Division: 4.0

=== Code Execution Successful ===