

Problem-1: Create a Java class Calculator that provides different ways to perform addition. Include three methods: The first method takes two integer numbers, the second method takes three integer numbers, and the third method takes two double numbers. In the main method, create an object of Calculator class.

Code:

Main.java

```
package Problem01;

public class Main {
    public static void main(String[] args) {

        Calculator cal1 = new Calculator();
        System.out.println("Sum of two integer : " + cal1.Addition(50, 60));
        System.out.println("Sum of two double : " + cal1.Addition(53.2, 47.5));
        System.out.println("Sum of three integer : " + cal1.Addition(5, 6, 8) +
    }
}
```

Calculator.java

```
package Problem01;

public class Calculator {

    public int Addition(int a, int b) {
        return (a + b);
    }

    public int Addition(int a, int b, int c) {
        return (a + b + c);
    }

    public double Addition(double x, double y) {
        return (x + y);
    }
}
```

Output:

Output

Vehicle:

Previous speed: 20km/h, Speeding upto : 40km/h

Bicycle:

Previous speed: 10km/h, Speeding upto : 15km/h

Car:

Previous speed: 80km/h, Speeding upto : 100km/h

Problem-2: Create a Java class Shape that provides different ways to calculate the area. Include three methods: the first method takes one parameter (side length) to calculate the area of a square, the second method takes two parameters (length and width) to calculate the area of a rectangle, and the third method takes one decimal parameter (radius) to calculate the area of a circle. In the main method, create an object of Shape class.

Code:

Main.java

```
package Problem02;

public class Main {
    public static void main(String[] args) {

        Shape shape1 = new Shape();
        shape1.calculateArea(5);
        shape1.calculateArea(10, 20);
        shape1.calculateArea(5.00);
    }
}
```

Shape.java

```
package Problem02;

public class Shape {

    public void calculateArea(int side_length) {
        System.out.println("Area of Square : " + (side_length * side_length));
    }

    public void calculateArea(int length, int width) {
        System.out.println("Area of Rectangle : " + (length * width));
    }

    public void calculateArea(double radius) {

        System.out.printf("Area of Circle : %.2f ", radius * radius * 3.1416);
    }
}
```

Output:

Ouput

```
Area of Square : 25
Area of Rectangle : 200
Area of Circle : 78.54
Process finished with exit code 0
```

Problem-3: Write a Java program to define a class Employee with instance variables name and id, along with a method calculateSalary(). Create two subclasses, Worker and Supervisor, each having additional instance variables baseSalary and bonus. In both subclasses, override the calculateSalary() method to compute and return the salary.

Code:

Main.java

```
package Problem03;

class Employee {

    public int id = 2011;
    public String name = "Sakib Khan";

    public double calculateSalary() {
        return 500.33;
    }

    public void displayEmployee() {
        System.out.println("Id : " + id);
        System.out.println("Name : " + name);
        System.out.println("Salary : " + calculateSalary());
    }
}

class Worker extends Employee {

    public void setName() {
        this.name = "Afran Nisho";
    }

    public void setId() {
        this.id = 2012;
    }

    double baseSalary = 10000.00;
    int bonus = 50000;

    @Override
    public double calculateSalary() {
        return baseSalary + bonus;
    }
}
```

Main.java

```
        public void displayWorker() {
            setName();
            setId();
            System.out.println("Id : " + id);
            System.out.println("Name : " + name);
            System.out.println("Salary : " + calculateSalary());
        }
    }

    class Supervisor extends Employee {

        public void setName() {
            this.name = "Raihan Rafi";
        }

        public void setId() {
            this.id = 5542;
        }

        double baseSalary = 55000.00;
        int bonus = 4000;

        @Override
        public double calculateSalary() {
            return baseSalary + bonus;
        }

        public void displaySupervisor() {
            setName();
            setId();
            System.out.println("Id : " + id);
            System.out.println("Name : " + name);
            System.out.println("Salary : " + calculateSalary());
        }
    }

    public class Main {
        public static void main(String[] args) {

            Employee emp1 = new Employee();
            emp1.displayEmployee();
            System.out.println();

            Worker wr1 = new Worker();
            wr1.displayWorker();
            System.out.println();

            Supervisor sp1 = new Supervisor();
            sp1.displaySupervisor();

        }
    }
```

Output:

Ouput

```
Id : 2011
Name : Sakib Khan
Salary : 500.33

Id : 2012
Name : Afran Nisho
Salary : 60000.0

Id : 5542
Name : Raihan Rafi
Salary : 59000.0

Process finished with exit code 0
```

Problem-4: Write a Java program to define a class Vehicle with a method speedUp(). Create two subclasses: Car and Bicycle, each having an instance variable currentSpeed. In both subclasses, override the speedUp() method to increase the vehicle's speed differently.

Code:

Vehicle.java

```
package Problem04;

class Vehicle {
    public void speedUp() {
        System.out.println("Vehicle:\n Previous
speed: 20km/h, Speeding upto : 40km/h");
    }
}

class Bicycle extends Vehicle {
    int currentSpeed = 10;

    @Override
    public void speedUp() {
        System.out.println("Bicycle:\n Previous
speed: 10km/h, Speeding upto : 15km/h");
    }
}

class Car extends Vehicle {
    int currentSpeed = 100;

    @Override
    public void speedUp() {
        System.out.println("Car:\n Previous speed:
80km/h, Speeding upto : 100km/h");
    }
}
```

Main.java

```
package Problem04;

public class Main {
    public static void main(String[] args) {
        Vehicle v1 = new Vehicle();
        v1.speedUp();

        v1 = new Bicycle();
        v1.speedUp();

        v1 = new Car();
        v1.speedUp();
    }
}
```

Output:

Output

```
Vehicle:
  Previous speed: 20km/h, Speeding upto : 40km/h
Bicycle:
  Previous speed: 10km/h, Speeding upto : 15km/h
Car:
  Previous speed: 80km/h, Speeding upto : 100km/h
```