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Aiml A2

PART-1
code -

```
public interface Shapes {
   double getArea();
   double getPerimeter();
}public class Circle implements Shapes {
   private double radius;
   public Circle(double radius) {
      this.radius = radius;
   }
   public double getArea() {
      return Math.PI * Math.pow(radius, 2);
   }
   public double getPerimeter() {
      return 2 * Math.PI * radius;
   }
}
public class Triangle implements Shapes {
   private double base;
   private double height;
   private double side1;
   private double side2;
   private double side3;

   public Triangle(double base, double height, double side1, double side2, double side3) {
      this.base = base;
      this.height = height;
      this.side1 = side1;
      this.side2 = side2;
      this.side3 = side3;
   }

   public double getArea() {
      return 0.5 * base * height;
   }

   public double getPerimeter() {
      return side1 + side2 + side3;
   }
}
public class Rectangle implements Shapes{
   private double width;
```

```
    private double height;

    public Rectangle(double width, double height) {
        this.width = width;
        this.height = height;
    }

    public double getArea() {
        return width * height;
    }

    public double getPerimeter() {
        return 2 * (width + height);
    }
}
public class Main {
    public static void main(String[] args) {
        // Create a circle with radius 5
        Circle circle = new Circle(5);
        System.out.println("Circle area: " + circle.getArea());
        System.out.println("Circle perimeter: " + circle.getPerimeter());

        // Create a triangle with base 6, height 4, and sides 3, 4, and 5
        Triangle triangle = new Triangle(6, 4, 3, 4, 5);
        System.out.println("Triangle area: " + triangle.getArea());
        System.out.println("Triangle perimeter: " + triangle.getPerimeter());

        // Create a rectangle with width 7 and height 3
        Rectangle rectangle = new Rectangle(7, 3);
        System.out.println("Rectangle area: " + rectangle.getArea());
        System.out.println("Rectangle perimeter: " + rectangle.getPerimeter());
    }
}
```

Output-

```
java -cp /tmp/OUqt71ziWM Main
Circle area: 78.53981633974483
Circle perimeter: 31.41592653589793
Triangle area: 12.0
Triangle perimeter: 12.0
Rectangle area: 21.0
Rectangle perimeter: 20.0
```

PART-2
Code –

```
public class TestEmployee {
   public static void main(String[] args) {
      NormalEmployee normalEmployee = new NormalEmployee("Bhavya Dashottar", "123
Main St", 1200000);
      BonusEmployee bonusEmployee = new BonusEmployee("Devansh Tiwari", "456 Oak
St", 1200000, 50000);

      System.out.println("Normal Employee:");
      System.out.println("Name: " + normalEmployee.getName());
      System.out.println("Address: " + normalEmployee.getAddress());
      System.out.println("Monthly Salary: " + normalEmployee.calculateMonthlySalary());

      System.out.println();

      System.out.println("Bonus Employee:");
      System.out.println("Name: " + bonusEmployee.getName());
      System.out.println("Address: " + bonusEmployee.getAddress());
      System.out.println("Monthly Salary: " + bonusEmployee.calculateMonthlySalary());
   }
}

public class BonusEmployee extends Employee {
   private int monthlyBonus;

   public BonusEmployee(String name, String address, int basicSalary, int monthlyBonus) {
      super(name, address, basicSalary);
      this.monthlyBonus = monthlyBonus;
   }

   @Override
   public int calculateMonthlySalary() {
      return (basicSalary / 12) + monthlyBonus;
   }

   // Getter and setter for monthlyBonus
}
public class NormalEmployee extends Employee {
   public NormalEmployee(String name, String address, int basicSalary) {
      super(name, address, basicSalary);
   }

   @Override
   public int calculateMonthlySalary() {
```

```
        return basicSalary / 12;
    }
}
public abstract class Employee {
    private String name;
    private String address;

    public String getName() {
        return name;
    }

    public void setName(String name) {
        this.name = name;
    }

    public String getAddress() {
        return address;
    }

    public void setAddress(String address) {
        this.address = address;
    }

    protected int basicSalary;

    public Employee(String name, String address, int basicSalary) {
        this.name = name;
        this.address = address;
        this.basicSalary = basicSalary;
    }

    public abstract int calculateMonthlySalary();

    // Getters and setters for name, address and basicSalary
}
```

Output -

```
Normal Employee:
Name: Bhavya Dashottar
Address: 123 Main St
Monthly Salary: 100000

Bonus Employee:
Name: Devansh Tiwari
Address: 456 Oak St
Monthly Salary: 150000

Process finished with exit code 0
```

Link - https://github.com/Bhavyadashottar18/Java-Sem4/tree/main/Assignment5