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Homework: Abstraction

Abstraction demonstration with abstract class Shape and concrete classes Circle and Rectangle :

```
package abstraction;

//Abstract class representing a shape
abstract class Shape {

    // Abstract method to calculate the area
    abstract double calculateArea();

    // Abstract method to display information about the shape
    abstract void displayInfo();
}

//Concrete class Circle that extends Shape
class Circle extends Shape {
    private double radius;

    // Constructor
    public Circle(double radius) {
        this.radius = radius;
    }

    // Implementation of abstract method from Shape
    @Override
    double calculateArea() {
        return Math.PI * radius * radius;
    }
```

```
    // Implementation of abstract method from Shape
    @Override
    void displayInfo() {
        System.out.println("Circle with radius: " + radius);
    }
}

//Concrete class Rectangle that extends Shape
class Rectangle extends Shape {
    private double length;
    private double width;

    // Constructor
    public Rectangle(double length, double width) {
        this.length = length;
        this.width = width;
    }

    // Implementation of abstract method from Shape
    @Override
    double calculateArea() {
        return length * width;
    }

    // Implementation of abstract method from Shape
    @Override
    void displayInfo() {
        System.out.println("Rectangle with length: " + length + " and
width: " + width);
    }
}

public class Main {
```

```
    public static void main(String[] args) {
        Circle circle = new Circle(5);
        Rectangle rectangle = new Rectangle(4, 6);

        // Calling abstract methods
        circle.displayInfo();
        System.out.println("Area of circle: " + circle.calculateArea() +
"\n");
        rectangle.displayInfo();
        System.out.println("Area of rectangle: " +
rectangle.calculateArea());
    }
}
```