Problem Statement 2:

Develop a Java application showcasing interface implementation and dependency injection. Define an interface "Shape" with methods for calculating area and perimeter, implement it in classes like "Circle" and "Rectangle," and demonstrate dependency injection to access their functionalities.

Solution:

```
interface Shape{
    double calculateArea();
    double calculatePerimeter();
}
```

```
// Circle class implementing Shape interface
class Circle implements Shape{
    private double radius;
    public Circle(double radius){
        this.radius=radius;
    }
    @Override
    public double calculateArea(){
        return Math.PI*radius*radius;
    }
    @Override
    public double calculatePerimeter(){
        return 2*Math.PI*radius;
    }
}
```

```java
// Rectangle class implementing Shape interface
class Rectangle implements Shape{
    private double length;
    private double width;

    public Rectangle(double length,double width){
        this.length=length;
        this.width=width;
    }
    @Override
    public double calculateArea(){
        return length*width;
    }
    @Override
    public double calculatePerimeter(){
        return 2*(length+width);
    }
}


//Dependency Injection class
class ShapeCalculator{
    private final Shape shape;

    public ShapeCalculator(Shape shape){
        this.shape=shape;
    }
    //Method to calculate Area
    public double calculateArea(){
        return shape.calculateArea();
    }

    //Method to calculate Perimeter
    public double calculatePerimeter(){
        return shape.calculatePerimeter();
    }
}
```

```
class Main{
    public static void main(String[] args) {
        // Creating objects of Circle and Rectangle
        Shape rectangle = new Rectangle(2.0,3.0);
        Shape circle = new Circle(3.0);

        // Dependency injection to access functionalities
        ShapeCalculator circleCalculator = new ShapeCalculator(circle);
        ShapeCalculator rectangleCalculator = new ShapeCalculator(rectangle);

        // Output area and perimeter of circle
        System.out.println("Circle Area: " + circleCalculator.calculateArea());
        System.out.println("Circle Perimeter: " +
circleCalculator.calculatePerimeter());

        // Output area and perimeter of rectangle
        System.out.println("Rectangle Area: " +
rectangleCalculator.calculateArea());
        System.out.println("Rectangle Perimeter: " +
rectangleCalculator.calculatePerimeter());

    }
}
```