## Aim:

Create an abstract class called **Shape.**
- Declare two abstract methods of type double: **calculateArea()** and **calculatePerimeter()**. These methods will be implemented by subclasses.
- Implement a concrete method named **displayDetails()** that displays information about the shape, including its area and perimeter.

Next, create two subclasses called **Rectangle** and **Circle** that extend the Shape class:
- Implement the **calculateArea()** and **calculatePerimeter()** methods in the Rectangle class. It should take input from the user for the length and width of the rectangle.
- Implement the **calculateArea()** and **calculatePerimeter()** methods in the Circle class. It should take input from the user for the radius of the circle.

### Note:
- The main method and the code for inputs are already provided, Fill in the remaining code

## Source Code:

q24919/Main.java

```java
package q24919;
import java.util.Scanner;
abstract class Shape {
    // write your code here...
    abstract double calculateArea();
    abstract double calculatePerimeter();

    void displayDetails() {
        System.out.println("Shape details:");
        System.out.println("Area: " + calculateArea());
        System.out.println("Perimeter: " + calculatePerimeter());
    }


}
class Rectangle extends Shape {
    double length;
    double width;

    @Override
    double calculateArea() {
      // write your code here...
      return length * width;

    }

    @Override
    double calculatePerimeter() {
      // write your code here...
      return 2*(length + width);
```

```java
    }
    void inputDetails(Scanner scanner) {
      System.out.print("Enter the length of the rectangle: ");
        length = scanner.nextDouble();

        System.out.print("Enter the width of the rectangle: ");
        width = scanner.nextDouble();
    }
}

class Circle extends Shape {
    double radius;

    @Override
    double calculateArea() {
      // write your code here...
      return Math.PI * radius * radius;

    }

    @Override
    double calculatePerimeter() {
      // write your code here...
      return 2*Math.PI*radius;


    }
    void inputDetails(Scanner scanner) {
      System.out.print("Enter the radius of the circle: ");
        radius = scanner.nextDouble();
    }
}

public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        Rectangle rectangle = new Rectangle();
        rectangle.inputDetails(scanner);
        rectangle.displayDetails();
        Circle circle = new Circle();
        circle.inputDetails(scanner);
        circle.displayDetails();
        scanner.close();
    }
}
```

## Execution Results - All test cases have succeeded!

| Test Case - 1 |
| --- |
| User Output |
| Enter the length of the rectangle:  3 |
| Enter the width of the rectangle:  4 |
| Shape details: 2 |
| Area: 12.0 2 |

| |
|---|
| Perimeter: 14.0 2 |
| Enter the radius of the circle:  2 |
| Shape details: |
| Area: 12.566370614359172 |
| Perimeter: 12.566370614359172 |