S.No: 12	Exp. Name: ***Areas of Shapes Using Abstract Class***	Date:2024-10-11

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 a subclass called **Circle** that extends the Shape class:

- Implement the **calculateArea()** method in this subclass. It should calculate and return the area of the circle.
- Implement the **calculatePerimeter()** method in this subclass. It should calculate and return the perimeter of the circle.

Note: The main method is already provided

Source Code:

Circle.java

```
import java.util.Scanner;
abstract class Shape {

   abstract double calculateArea();
   abstract double calculatePerimeter();
   public void displayDetails(){
      System.out.println("Shape details:");
      System.out.println("Area: "+calculateArea());
      System.out.println("Perimeter: "+calculatePerimeter());
}
}
class Circle extends Shape {
    double radius;
    public Circle(double radius) {
        this.radius = radius;
    }
    @Override
    double calculateArea() {

      return(3.141592653589793*radius*radius);

    }
    @Override
    double calculatePerimeter() {

   return(2*3.141592653589793*radius);

    }

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter the radius of the circle: ");
        double radius = scanner.nextDouble();
```

```
        Circle circle = new Circle(radius);
        circle.displayDetails();
        scanner.close();
    }
}
```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
Enter the radius of the circle: 3
Shape details:
Area: 28.274333882308138
Perimeter: 18.84955592153876

Test Case - 2
User Output
Enter the radius of the circle: 4.2
Shape details:
Area: 55.41769440932395
Perimeter: 26.389378290154262

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