Program: Write a program in java to design a class using abstract method and classes

import java.util.Scanner;

// Abstract class definition

abstract class Shape {

 // Abstract method

 abstract double calculateArea();

 // Concrete method

 void display() {

 System.out.println("This is a shape.");

 }

}

// Subclass 1: Circle

class Circle extends Shape {

 private double radius;

 // Constructor

 Circle(double radius) {

 this.radius = radius;

 }

 // Implementation of abstract method

 @Override

 double calculateArea() {

 return Math.PI \* radius \* radius;

 }

}

// Subclass 2: Rectangle

class Rectangle extends Shape {

 private double length;

 private double width;

 // Constructor

 Rectangle(double length, double width) {

 this.length = length;

 this.width = width;

 }

 // Implementation of abstract method

 @Override

 double calculateArea() {

 return length \* width;

 }

}

// Main class

public class Main {

 public static void main(String[] args) {

 Scanner scanner = new Scanner(System.in);

 // Input for Circle

 System.out.print("Enter the radius of the circle: ");

 double radius = scanner.nextDouble();

 Shape circle = new Circle(radius);

 System.out.println("Area of Circle: " + circle.calculateArea());

 // Input for Rectangle

 System.out.print("Enter the length of the rectangle: ");

 double length = scanner.nextDouble();

 System.out.print("Enter the width of the rectangle: ");

 double width = scanner.nextDouble();

 Shape rectangle = new Rectangle(length, width);

 System.out.println("Area of Rectangle: " + rectangle.calculateArea());

 scanner.close();

 }

}