

12/1/24

LAB Program 4

Develop a Java Program to create an abstract class named Shape that contains two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contain only the method printArea() that prints the area of the given shape.

Code:-

```
import java.util.Scanner;
```

```
abstract class Shape {
```

```
    double dimension1;
```

```
    double dimension2;
```

```
    public abstract void printArea();
```

```
}
```

```
class Rectangle extends Shape {
```

```
    public Rectangle(double length, double width) {
```

```
        this.dimension1 = length;
```

```
        this.dimension2 = width;
```

```
}
```

```
@Override
```

```
    public void printArea() {
```

```
        double area = dimension1 * dimension2;
```

```
        System.out.println("Area of Rectangle:" + area);
```

```
}
```

```
}
```

```
class Triangle extends Shape {
```

```
    public Triangle(double base, double height) {
```

```
        this.dimension1 = base;
```

```
        this.dimension2 = height;
```

```
}
```

```
@Override
```

```
    public void printArea() {
```

```
        double area = 0.5 * dimension1 * dimension2;
```

```
        System.out.println("Area of Triangle:" + area);
```

```
}
```

```
}
```



```
class Circle extends Shape {
```

```
    public Circle (double radius) {
```

```
        this.dimension1 = radius;
```

```
    }
```

```
    @Override
```

```
    public void printArea() {
```

```
        double area = Math.PI * dimension1 * dimension1;
```

```
        System.out.println ("Area of Circle: " + area);
```

```
    }
```

```
}
```

```
public class area {
```

```
    Scanner scanner = new Scanner(System.in);
```

```
    System.out.println ("Choose a Shape to Calculate Area: ");
```

```
    System.out.println ("1. Rectangle);
```

```
    System.out.println ("2. Triangle);
```

```
    System.out.println ("3. Circle);
```

```
    System.out.println ("4. Exit);
```

```
    int run = 1;
```

```
    while (run == 1) {
```

```
        System.out.println ("Enter choice: ");
```

```
        int choice = scanner.nextInt();
```

```
        switch (choice) {
```

```
            case 1: System.out.print ("Enter the length: ");
```

```
                double length = scanner.nextDouble();
```

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

```
                double width = scanner.nextDouble();
```

```
                Rectangle rectangle = new Rectangle (length, width);
```

```
                rectangle.printArea();
```

```
                break;
```

```
            case 2: System.out.print ("Enter Base of Triangle: ");
```

```
                double base = scanner.nextDouble();
```

```
                System.out.print ("Enter Height: ");
```

```
                double height = scanner.nextDouble();
```

```
                Triangle triangle = new triangle (base, height);
```

```
                triangle.printArea();
```

```
                break;
```



```

Case 3: System.out.print("Enter radius of Circle:");
double radius = scanner.nextDouble();
Circle circle = new Circle(radius);
circle.printArea();
break;

```

```

Case 4: run();
break;
default: System.out.print("Invalid choice.");
}
}
Scanner.close();
}

```

Output:

Choose Shape to Calculate Area: 1. Rectangle 2. Triangle 3. Circle 4. Exit

Enter choice: 1

Enter length: 10

Enter width: 5

Area of Rectangle: 50.00

Enter Choice: 2

Enter Base: 2

Enter Height: 1

Area of Triangle: 1.0

Enter choice: 3

Enter radius of Circle: 2

Area of Circle: 12.566

Enter choice: 4

Exited.