

23/10/24

Lab Program 4

- Q) Develop a java program to create an abstract class named Shape that contains 2 integers and an empty method named printArea(). Provide 3 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.

Source Code

```
import java.util.*;

abstract class Shape {
    int dim1, dim2;
    public Shape() {
        this.dim1 = 0;
        this.dim2 = 0;
    }
    public Shape(int dim1, int dim2) {
        this.dim1 = dim1;
        this.dim2 = dim2;
    }
    public abstract void printArea();
}
```

```
class Rectangle extends Shape {
    public Rectangle(int length, int breadth) {
        dim1 = length;
        dim2 = breadth;
    }
    public void printArea() {
        int area = dim1 * dim2;
        System.out.println("Area of rectangle: " + area);
    }
}
```



```

class Triangle extends Shape {
    public Triangle (int base, height) {
        dim1 = base;
        dim2 = height;
    }
    public void printArea() {
        double area = 0.5 * dim1 * dim2;
        System.out.println ("Area of Triangle: " + area);
    }
}

```

```

class Circle extends Shape {
    public Circle (int radius) {
        dim1 = radius;
        dim2 = 0;
    }
    public void printArea() {
        double area = Math.PI * dim1 * dim2;
        System.out.println ("Area of Circle: " + area);
    }
}

```

```

public class Shapes {
    public static void main (String[] args) {
        Scanner sc = new Scanner (System.in);
        System.out.println ("Enter length and breadth for Rectangle:");
        int length = sc.nextInt();
        int breadth = sc.nextInt();
        Shape rectangle = new Rectangle (length, breadth);
        rectangle.printArea();
        System.out.println ("Enter base and height for Triangle:");
        int base = sc.nextInt();
    }
}

```



```

int height = sc.nextInt();
Shape triangle = new Triangle(base, height);
triangle.printArea();
System.out.println("Enter radius for Circle:");
int radius = new sc.nextInt();
Shape circle = new Circle(radius);
circle.printArea();
}
}
    
```

Output

Enter length and width for Rectangle:

10
20

Area of Rectangle: 200

Enter base and height for Triangle:

20
30

Area of Triangle: 300.0

Enter radius for Circle:

10

Area of Circle: 314.1592653589793

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