22/1/24

8] Program to create abstract class named Shape that contains two integer & empty method printArea(). Provide three classes Rectangle, Triangle & Circle such that each one classes extends the class Shape. Each one of the classes contains method printArea() that prints the area of given shape.

→
```
abstract class Shape {
    protected int length;
    protected int breadth;

    public Shape (int length, int breadth)
    {
        this.length = length;
        this.breadth = breadth;
    }

    public abstract void printArea();
}

class Rectangle extends Shape {
    public Rectangle (int length, int breadth)
    super(length, breadth);
    }

    public void printArea()
    {
        int area = length * breadth;
        System.out.println("Rectangle area:" + area);
    }
}

class Triangle extends Shape{
    public Triangle(int length, int breadth){
    super(length, breadth);
    }

    public void printArea(){
    double area = 0.5 * length * breadth;
    SOP("Triangle area:" + area);
    }
}
```

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

public class Main {
    public static void main(String [] args) {
        Rectangle rectangle = new Rectangle (5, 10);
        Triangle triangle = new Triangle (4, 10);
        Circle circle = new Circle (3);
        rectangle.printArea();
        triangle.printArea();
        circle.printArea();
    }
}
```

Output:

Rectangle Area: 50

Triangle Area: 20.0

Circle Area: ~~28.274333882308138~~

AREA CALCULATION - ABSTRACT CLASS

```
import java.util.Scanner;

abstract class Shape{
    int a,b;
    Shape(int a,int b){
        this.a=a;
        this.b=b;
    }
    public abstract void printArea();
}
    class Rectangle extends Shape{
        Rectangle(int length,int breadth){
            super(length,breadth);
        }
        public void printArea(){
            System.out.println("Area of Rectangle = "+(a*b));
        }
    }
    class Triangle extends Shape{
        Triangle(int base,int height){
            super(base,height);
        }
        public void printArea(){
            System.out.println("Area of Triangle = "+(0.5*a*b));
        }
    }
    class Circle extends Shape{
        Circle(int radius){
            super(radius,0);
        }
        public void printArea(){
            System.out.println("Area of Circle = "+(Math.PI*a*a));
        }
    }



public class Area {
    public static void main(String[] args) {
        Scanner sc= new Scanner(System.in);
        System.out.println("Enter length and breadth of Rectangle");
        int length=sc.nextInt();
        int breadth=sc.nextInt();
        System.out.println("Enter base and height of Triangle");
        int base=sc.nextInt();
```

```
        int height=sc.nextInt();
        System.out.println("Enter radiius of a Circle");
        int radiius=sc.nextInt();

        Rectangle rectangle=new Rectangle(length, breadth);
        Triangle triangle=new Triangle(base, height);
        Circle circle=new Circle(radiius);

        rectangle.printArea();
        triangle.printArea();
        circle.printArea();

    }
}
```

OUTPUT :

```
Enter length and breadth of Rectangle
10 20
Enter base and height of Triangle
2 5
Enter radiius of a Circle
8
Area of Rectangle = 200
Area of Triangle = 5.0
Area of Circle = 201.06192982974676
```