WEEK 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.

Source Code:

```
abstract class Shape {
    int dim1;
    int dim2;


    abstract void printArea();
}

class Rectangle extends Shape {
    public Rectangle(int length, int width) {
        this.dim1 = length;
        this.dim2 = width;
    }


    void printArea() {
        int area = dim1 * dim2;
        System.out.println("Area of Rectangle: " + area);
    }
}

class Triangle extends Shape {
    public Triangle(int base, int height) {
        this.dim1 = base;
        this.dim2 = height;
    }

    void printArea() {
        double area = 0.5 * dim1 * dim2;
        System.out.println("Area of Triangle: " + area);
    }
}

class Circle extends Shape {
```

```
    public Circle(int radius) {
        this.dim1 = radius;
        this.dim2 = 0;
    }


    void printArea() {
        double area = Math.PI * dim1 * dim1;
        System.out.println("Area of Circle: " + area);
    }
}

public class Main {
    public static void main(String[] args) {
        Shape rectangle = new Rectangle(8,9);
        Shape triangle = new Triangle(8, 6);
        Shape circle = new Circle(14);

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

OUTPUT:

```
Area of Rectangle: 72
Area of Triangle: 24.0
Area of Circle: 615.7521601035994
PS C:\Users\satis\OneDrive\Documents\ooj_lab>
```

OBSERVATION:

④ Develop a program for an abstract class shape having two variable and an empty method printarea(). Provide three class name triangle, rec, circle which extends shape, print area().

```
// eta import java.util.Scanner

abstract class Shape
{
  int dim1;
  int 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 width)
  {
    dim1 = length;
    dim2 = width;
  }

  Public void PrintArea()
  {
    int area = dim1 * dim2;
    System.out.println("Area of Rectangle:" + area);
  }

}
```

```
class Triangle extends Shape{
    public Triangle (int base, int height)
    {
        dim1 = base;
        dim2 = height;
    }
    public void printArea()
    {
        double area = 0.5 * dim1 * dim2;
        System.out.println("Area of tle :" + area);
    }
}
class Circle extends Shape
{
    public Circle (int radius)
    {
        dim1 = radius;
        dim2 = 0;
    }
    public void Print Area()
    {
        double area = Math.PI * dim1 * dim1;
    }
}
public class Shapes
{
    public static void main (String[] args)
    {
        Scanner in = new Scanner(System.in);

        System.out.println("Enter length & width for Rectangle");
        int length = in.nextInt();
        int width = in.nextInt();
        Shape rectangle.PrintArea();
```

```
System.out.println("Enter base & height for Triangle");
int base = in.nextInt();
int height = in.nextInt();
Shape triangle = new Triangle(base, height);
triangle.PrintArea();

System.out.println("Enter radius of Circle");
int radius = in.nextInt();
Shape circle = new Circle(radius);
Circle.printArea();

in.close();
}
}
```

OUTPUT:

```
Enter length & width for Rectangle:
20 30
Area of Rectangle: 600
Enter base & height for Triangle:
20 40
Area of Triangle: 400
Enter radius for Circle:
40
Area of Circle: 5026.5482
```