Shape

```java
import java.util.Scanner;

abstract class Shape {

    int dimension1;

    int dimension2

    abstract void printArea();

}

class Rectangle extends Shape {

    public Rectangle(int length, int width) {

        this.dimension1 = length;

        this.dimension2 = width;

    }

    void printArea() {

        int area = dimension1 * dimension2;

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

    }

}

class Triangle extends Shape {

    public Triangle(int base, int height) {

        this.dimension1 = base;

        this.dimension2 = height;

    }

    void printArea() {

        double area = 0.5 * dimension1 * dimension2;

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

    }

}

class Circle extends Shape {

    private final double pi = 3.14159;

    public Circle(int radius) {

        this.dimension1 = radius;
```

```java
        this.dimension2 = 0;
    }
    void printArea() {
        double area = pi * dimension1 * dimension1;
        System.out.println("Circle Area: " + area);
    }
}
public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter length of rectangle: ");
        int length = scanner.nextInt();
        System.out.print("Enter width of rectangle: ");
        int width = scanner.nextInt();
        Rectangle rectangle = new Rectangle(length, width);
        rectangle.printArea();

        System.out.print("Enter base of triangle: ");
        int base = scanner.nextInt();
        System.out.print("Enter height of triangle: ");
        int height = scanner.nextInt();
        Triangle triangle = new Triangle(base, height);
        triangle.printArea();

        System.out.print("Enter radius of circle: ");
        int radius = scanner.nextInt();
        Circle circle = new Circle(radius);
        circle.printArea();
        scanner.close();
    }}
```

```
Microsoft Windows [Version 10.0.22631.4317]
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C:\Users\Admin\Documents\23cs310>javac Main.java

C:\Users\Admin\Documents\23cs310>java Main
Enter length of rectangle: 5
Enter width of rectangle: 3
Rectangle Area: 15
Enter base of triangle: 4
Enter height of triangle: 6
Triangle Area: 12.0
Enter radius of circle: 7
Circle Area: 153.93791
```

Program IV

Q. 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 & 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.

```java
import java.util.Scanner;

abstract class Shape {
    int dimension1;
    int dimension2;

    abstract void printArea();
}

class Rectangle extends Shape {

    public Rectangle(int length, int width) {
        this.dimension1 = length;
        this.dimension2 = width;
    }

    void printArea() {
        int area = dimension1 * dimension2;
        S.O.p("Rectangle Area " + area);
    }
}

class Triangle extends Shape {

    public Triangle(int base, int height) {
        this.dimension1 = base;
        this.dimension2 = height;
    }

    void printArea() {
        double area = 0.5 * dimension1 * dimension2;
        S.O.p("Triangle Area " + area);
    }
}

class Circle extends Shape {
    private final double pi = 3.14159;

    public Circle(int radius) {
        this.dimension1 = radius;
        this.dimension2 = 0;
    }

    void printArea() {
        double area = pi * dimension1 * dimension1;
        S.O.p("Circle Area " + area);
    }
}

public class Main {
    public static void main(String [] args) {
        Scanner scanner = new Scanner(System.in);

        S.O.p("Enter length of rectangle");
        int length = scanner.nextInt();
        S.O.p("Enter width of rectangle");
        int width = scanner.nextInt();
        Rectangle rectangle = new Rectangle(length, width);
        rectangle.printArea();

        S.O.p("Enter base of triangle");
        int base = scanner.nextInt();
        S.O.p("Enter height of triangle");
        int height = scanner.nextInt();
        Triangle triangle = new Triangle(base, height);
        triangle.printArea();

        S.O.p("Enter radius of circle");
        int radius = scanner.nextInt();
        Circle circle = new Circle(radius);
        circle.printArea();

        scanner.close();
    }
}
```

output

Enter length of rectangle 5
Enter width of rectangle 3
Rectangle Area 15

Enter base of triangle 4
Enter height of triangle 6
Triangle Area 12

Enter radius of circle 7
Circle Area 153.93804