

Lab4. 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
{
    shape(){}

    int h,b;

    abstract void printArea();

}

class rectangle extends shape
{
    Scanner s=new Scanner(System.in);

    void printArea()
    {
        System.out.println("Enter height and width of rectangle");

        h=s.nextInt();

        b=s.nextInt();

        System.out.println("Area of Rectangle is "+b*h);

    }

    rectangle(){}

}

class triangle extends shape
{
    Scanner s=new Scanner(System.in);
```

```

void printArea()
{
    System.out.println("Enter height and base of Triangle");
    h=s.nextInt();
    b=s.nextInt();
    System.out.println("Area of Triangle is "+0.5*b*h);
}
triangle(){}
}

```

```

class circle extends shape
{
    Scanner s=new Scanner(System.in);
    void printArea()
    {
        System.out.println("Enter radius of Circle");
        h=s.nextInt();
        System.out.println("Area of Circle is "+3.14*h*h);
    }
    circle(){}
}

```

```

class Lab4
{
    public static void main(String xx[])
    {
        rectangle r=new rectangle();
        r.printArea();
    }
}

```

```

        triangle t=new triangle();

        t.printArea();

        circle c=new circle();

        c.printArea();

    }

}

```

The screenshot shows a Windows desktop environment. In the background, a Notepad window titled 'Lab4 - Notepad' contains the following Java code:

```

Scanner s=new Scanner(System.in);
void printArea()
{
}

class circle
{
    Scanner s;
    void printArea()
    {
        System.out.println("Enter height and width of rectangle");
        int h=s.nextInt();
        int w=s.nextInt();
        System.out.println("Area of Rectangle is "+h*w);
        System.out.println("Enter height and base of Triangle");
        int h1=s.nextInt();
        int b=s.nextInt();
        System.out.println("Area of Triangle is "+0.5*h1*b);
        System.out.println("Enter radius of Circle");
        int r=s.nextInt();
        System.out.println("Area of Circle is "+3.14*r*r);
    }
}

class Lab4
{
    public static void main(String[] args)
    {
        rectangle r=new rectangle();
        r.printArea();
        triangle t=new triangle();
        t.printArea();
        circle c=new circle();
        c.printArea();
    }
}

```

In the foreground, a Command Prompt window is open, showing the execution of the code. The prompt is at the directory 'C:\Users\bmsce\Desktop\18M21CS047\week-4'. The user has entered 'javac Lab4.java' and 'java Lab4'. The output shows the program running and prompting for input. The user has entered '10 20' for the rectangle, resulting in 'Area of Rectangle is 200'. Then, the user entered '10 20' for the triangle, resulting in 'Area of Triangle is 100.0'. Finally, the user entered '5' for the circle, resulting in 'Area of Circle is 78.5'. The Command Prompt window also shows the 'Activate Windows' watermark.

9/11/22

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

```
import java.util.Scanner;
abstract class Shape
{
    Shape() {}
    int h, b;
    abstract void printArea();
}
```

Class Rectangle extends Shape

```
{
    Scanner s = new Scanner(System.in);
    void printArea()
    {
        System.out.println("Enter height & width of rectangle");
        h = s.nextInt();
        b = s.nextInt();
        System.out.println("Area of rectangle is " + b * h);
    }
    Rectangle() {}
}
```

Class Triangle extends Shape

```
{
    Scanner s = new Scanner(System.in);
    void printArea()
    {
        System.out.println("Enter height & base of triangle");
        h = s.nextInt();
        b = s.nextInt();
        System.out.println("Area of triangle is " + 0.5 * b * h);
    }
    Triangle() {}
}
```

Class Circle extends Shape

```
{
    Scanner s = new Scanner(System.in);
    void printArea()
    {
        System.out.println("Enter radius of circle");
        r = s.nextInt();
        System.out.println("Area of circle is " + 3.14 * r * r);
    }
    Circle() {}
}
```

class Lab4

```
A {  
1 public static void main(String x[])  
{  
    rectangle r = new rectangle();  
    r.printArea();  
    triangle t = new triangle();  
    t.printArea();  
    circle c = new circle();  
    c.printArea();  
}  
}
```

Output

Enter height and width of rectangle

10 20

Area of Rectangle is 200

Enter height and base of triangle

Area of triangle is 100.0

Enter radius of circle

5

Area of circle is 78.5

*Optimization*

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