

LAB 4:

PROGRAM:-

```
abstract class Shape{
```

```
double dim1;
```

```
double dim2;
```

```
Shape(double a,double b){
```

```
dim1=a;
```

```
dim2=b;
```

```
}
```

```
abstract double printarea();
```

```
}
```

```
class Rectangle extends Shape{
```

```
Rectangle(double a,double b){
```

```
super(a,b);
```

```
}
```

```
double printarea(){
```

```
System.out.println("Area for Rectangle");
```

```
return dim1*dim2;
```

```
}
```

```
}
```

```
class Triangle extends Shape{
```

```

Triangle(double a,double b){
    super(a,b);
}

double printarea(){
    System.out.println("Area for Triangle");
    return dim1*dim2/2;
}
}

```

```

class Circle extends Shape{
    Circle(double a){
        super(a,a);
    }

    double printarea(){
        System.out.println("Area for Circle");
        return 3.14*dim1*dim1;
    }
}

```

```

class AbstractAreas{
    public static void main(String args[]){
        Rectangle r=new Rectangle(6,7);
        Triangle t=new Triangle(8,20);
        Circle c=new Circle(9);
    }
}

```

```

Shape shaperef;

shaperef=r;

System.out.println("Area is :"+shaperef.printarea());

shaperef=t;

System.out.println("Area is :"+shaperef.printarea());

shaperef=c;

System.out.println("Area is :"+shaperef.printarea());

}

}

```

SCREENSHOTS OF PROGRAM AND OUTPUT:-

The screenshot shows a Notepad++ window with the following Java code:

```

AbstractAreas - Notepad
File Edit Format View Help
abstract class Shape{
double dim1;
double dim2;

Shape(double a,double b){
dim1=a;
dim2=b;
}
abstract double printarea();
}

class Rectangle extends Shape{
Rectangle(double a,double b){
super(a,b);
}
double printarea(){
System.out.println("Area for Rectangle");
return dim1*dim2;
}
}

class Triangle extends Shape{
Triangle(double a,double b){
super(a,b);
}
double printarea(){
System.out.println("Area for Triangle");
return dim1*dim2/2;
}
}

class Circle extends Shape{
Circle(double a){
//...
}
}

```

The output window shows the following results:

```

C:\java>javac AbstractAreas.java
C:\java>java AbstractAreas
Area for Rectangle
Area is :42.0
Area for Triangle
Area is :88.0
Area for Circle
Area is :254.34
C:\java>

```

The screenshot shows a Windows desktop with two windows. The left window, titled 'AbstractAreas - Notepad', contains the following Java code:

```
File Edit Format View Help
Triangle(double a,double b){
    super(a,b);
}
double printarea(){
    System.out.println("Area for Triangle");
    return dim1*dim2/2;
}

class Circle extends Shape{
    Circle(double a){
        super(a,a);
    }
    double printarea(){
        System.out.println("Area for Circle");
        return 3.14*dim1*dim1;
    }
}

class AbstractAreas{
    public static void main(String args[]){
        Rectangle r=new Rectangle(6,7);
        Triangle t=new Triangle(8,20);
        Circle c=new Circle(9);
        Shape shaperef;
        shaperef=r;
        System.out.println("Area is :"+shaperef.printarea());
        shaperef=t;
        System.out.println("Area is :"+shaperef.printarea());
        shaperef=c;
        System.out.println("Area is :"+shaperef.printarea());
    }
}
```

The right window, titled 'Select C:\Windows\System32\cmd.exe', shows the output of the Java program:

```
Microsoft Windows [Version 10.0.18363.418]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\java>javac AbstractAreas.java

C:\java>java AbstractAreas
Area for Rectangle
Area is :42.0
Area for Triangle
Area is :80.0
Area for Circle
Area is :254.34

C:\java>
```

The taskbar at the bottom shows the Windows Start button, a search bar, and several application icons. The system clock indicates the time is 12:36 on 06-11-2020.

WRITTEN PROGRAM:-

Develop a Java program to create an abstract class named shape that contains 2 integers and an empty method name printArea(). Provide 3 classes named Rectangle, Triangle and Circle such that each one of class extends the class shape. Each one of the classes contain only the method printArea() that prints the area of given shape.

Program

```
abstract class Shape {  
    double dim1;  
    double dim2;  
  
    Shape(double a, double b) {  
        dim1 = a;  
        dim2 = b;  
    }  
    abstract double printArea();  
}  
  
class Rectangle extends Shape {  
    Rectangle(double a, double b) {  
        super(a, b);  
    }  
    double printArea() {  
        System.out.println("Area of rectangle");  
        return dim1 * dim2;  
    }  
}
```

```

class Triangle extends shape {
    Triangle (double a, double b) {
        super(a,b);
    }
    double printarea() {
        System.out.println("Area for Triangle");
        return dim1 * dim2 / 2;
    }
}

```

```

class Circle extends shape {
    Circle (double a) {
        super(a);
    }
    double printarea() { double a = 8.25;
        System.out.println("Area for circle");
        return 3.14 * dim1 * dim1;
    }
}

```

```

class AbstractArea {
    public static void main (String args[]) {
        Rectangle r = new Rectangle(6,7);
        Triangle t = new Triangle(8,20);
        Circle c = new Circle(9);
        shape shaperef;
        shaperef = r;
        System.out.println("Area is" + shaperef.printarea());
        shaperef = t;
        System.out.println("Area is" + shaperef.printarea());
        shaperef = c;
        System.out.println("Area is" + shaperef.printarea());
    }
}

```

