

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;

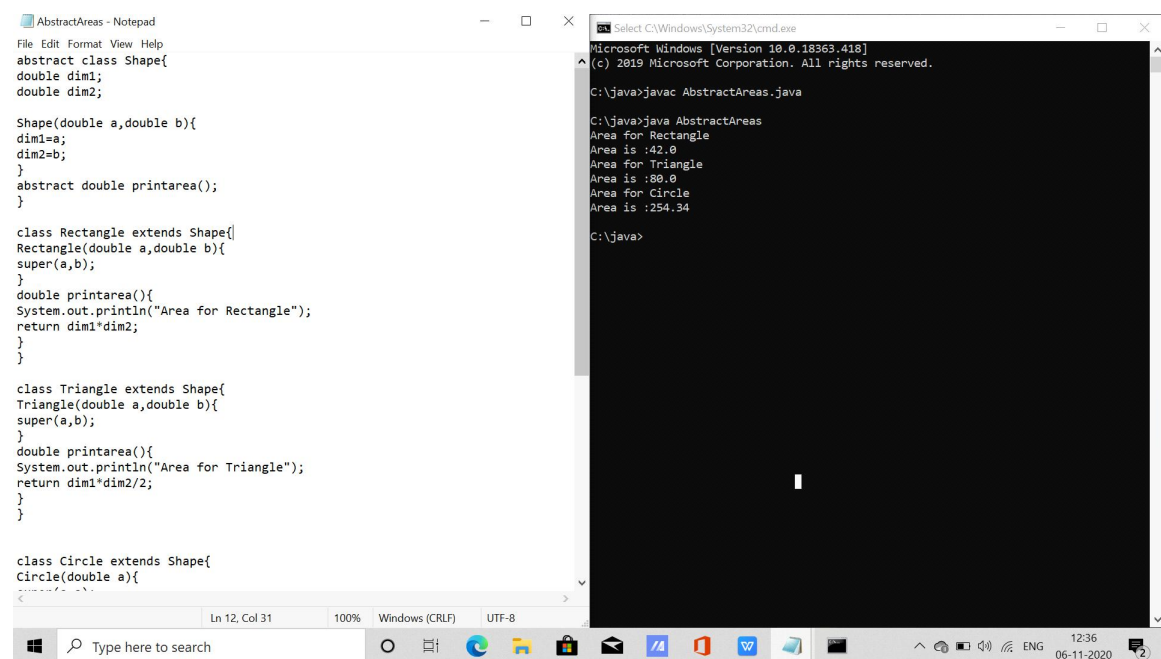
System.out.println("Area is :"+shaperef.printarea());

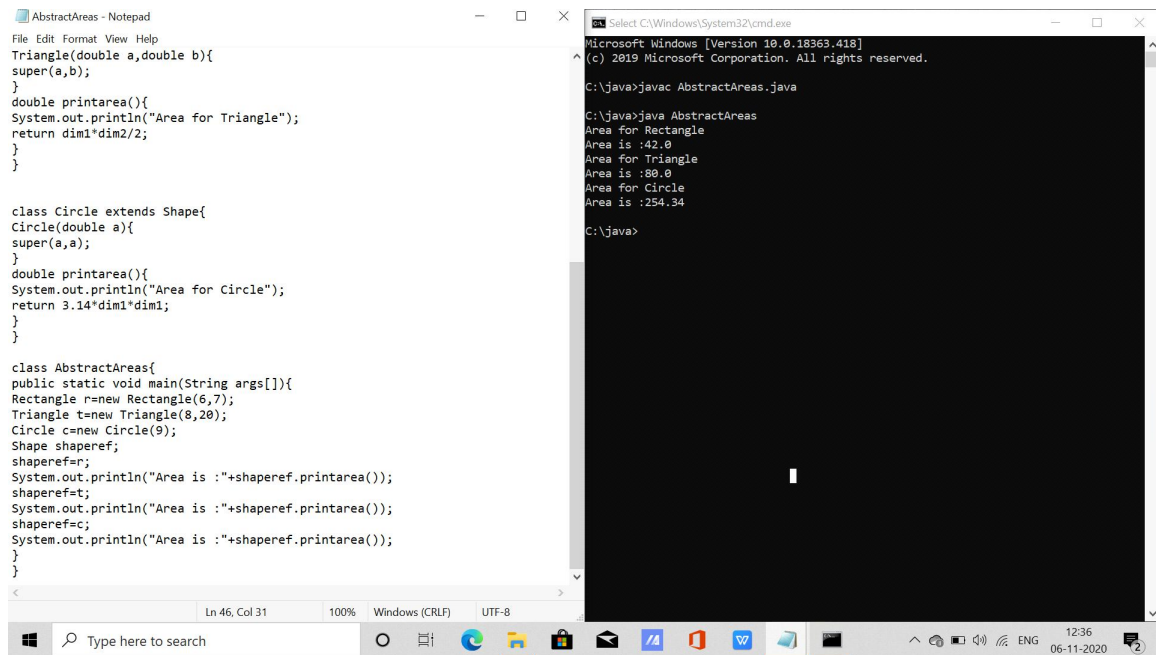
}

}

```

SCREENSHOTS OF PROGRAM AND OUTPUT:-





The screenshot displays a Windows desktop environment. On the left, a Notepad++ 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());
    }
}
```

On the right, a Command Prompt window titled 'Select C:\Windows\System32\cmd.exe' shows the execution of the 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 Windows taskbar at the bottom shows the search bar, task view button, and several pinned application icons. The system tray on the right indicates the time as 12:36 and the date as 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 = 3.14;
        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());
    }
}

```

