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<b>Roll Number: 45</b>		<b>Lab Assignment Number: 3</b>
<b>Title of Lab Assignment: Assignment based on Generics.</b>		
<b>DOP: 31/08/2023</b>		<b>DOS: 08-09-2023</b>
<b>CO Mapped:</b> CO1, CO2	<b>PO Mapped:</b> PO1, PO7, PO8, PO10, PSO1	<b>Signature:</b>

**PRACTICAL 3****Aim:**

- A)** Implement bounded types (extend super class) with generics.

Create a class shape with method Area() create circle and Square which extends Class Shape.

Create a generic class Bounded Shape that extends shape and implement the generics and use area function accordingly.

**Code:**

```
package test;

abstract class Shape{
    double d;
    abstract double area();
}
class Circle extends Shape{
    Circle(double d1){
        d = d1;
    }
    double area() {
        return Math.PI * d * d;
    }
}
class Square extends Shape{
    Square(double d1){
        d = d1;
    }
    double area() {
        return d * d;
    }
}
class BoundedShape<T extends Shape>{
    T ob;
    BoundedShape(T ob1){
        ob = ob1;
    }
    void area(String shape) {
        System.out.println("Area of " + shape + " = " + ob.area());
    }
}
public class test {
    public static void main(String[] args) {
        Circle c = new Circle(5);
```

```
        BoundedShape<Circle> boundedcircle = new  
BoundedShape<Circle>(c);  
        boundedcircle.area("Circle");  
  
        Square s = new Square(5);  
        BoundedShape<Square> boundedsquare = new  
BoundedShape<Square>(s);  
        boundedcircle.area("Square");  
    }  
}
```

**Output:**

```
Area of Circle = 78.53981633974483  
Area of Square = 78.53981633974483
```

- B)** Implement bounded types (implements an interface) with generics. Create an Interface shape with method Area() create Circle and Square which implements Class Shape. Create a generic class Bounded Shape that extends shape and implement the generics and use area function accordingly.

**Code:**

```
interface Shape{
    double area();
}
class Circle implements Shape{
    double radius;
    Circle(double d){
        radius=d;
    }
    public double area(){
        return Math.PI * radius * radius;
    }
}
class Square implements Shape{
    double side;
    Square(double d){
        side=d;
    }
    public double area(){
        return side * side;
    }
}
class BoundedShape<T extends Shape>{
    T ob;
    BoundedShape(T ob1){
        ob=ob1;
    }
    void area(String shape){
        System.out.println("area of "+ shape +" is = "+ ob.area());
    }
}
public class Main{
    public static void main(String[] args) {
        Circle c=new Circle(2);
        BoundedShape<Circle> boundedCircle=new BoundedShape<Circle>(c);
        boundedCircle.area("circle");

        Square s=new Square(2);
```

```
        BoundedShape<Square> boundedSquare=new  
BoundedShape<Square>(s);  
        boundedSquare.area("square");  
    }  
}
```

**Output:**

```
PS F:\Pushkar\MCA\Sem 1\Java> & 'C:\Program Files\Java\jdk-20\  
cbad9d3df6\redhat.java\jdt_ws\Java_75c21111\bin' 'Practical3B'  
area of circle is = 12.566370614359172  
area of square is = 4.0  
PS F:\Pushkar\MCA\Sem 1\Java>
```