**Main code:**  
public class Main {  
 public static void main(String[] args) {  
 Shape shape;  
 Shape3D shape3D;  
 Shape2D shape2D;  
 Circle circle=new Circle("Circle");  
 circle.setRadius(33.5);  
 System.*out*.println("Area of circle is: "+circle.area());  
 Rectangle rectangle=new Rectangle("Rectangle",4.4,5.5);  
 rectangle.setLength(68);  
 rectangle.setWidth(44);  
 Rectangle rectangle2=new Rectangle("Rectangle2",6.4,77);  
 rectangle2.setLength(60);  
 rectangle2.setWidth(45);  
 System.*out*.println("Area of rectangle is: "+rectangle.area());  
 Sphere sphere=new Sphere("Sphere",23.4);  
 System.*out*.println("Area of sphere is: "+sphere.area());  
 System.*out*.println("Volume of sphere is: "+sphere.volume());  
 Cube cube=new Cube("Cube",44);  
 System.*out*.println("Area of Cube is"+cube.area());  
 System.*out*.println("Volume of Cube is"+cube.volume());  
 Shape[] shape1 = new Shape[20];  
 shape1[0]=circle;  
 shape1[1]=rectangle;  
 shape1[2]=sphere;  
 shape1[3]=cube;  
 shape1[4]=circle;  
 shape1[5]=rectangle;  
 shape1[6]=sphere;  
 shape1[7]=cube;  
 shape1[8]=circle;  
 shape1[9]=rectangle;  
 shape1[10]=sphere;  
 shape1[11]=cube;  
 shape1[12]=circle;  
 shape1[13]=rectangle;  
 shape1[14]=sphere;  
 shape1[15]=cube;  
 shape1[16]=circle;  
 shape1[17]=rectangle;  
 shape1[18]=sphere;  
 shape1[19]=cube;  
 ShapeUtils shapeUtils=new ShapeUtils();  
 shapeUtils.printShape(shape1);  
 shapeUtils.increaseRectangleLength(shape1, 22);  
 System.*out*.println("--------After increase in length----------");  
 shapeUtils.printShape(shape1);  
 boolean state=shapeUtils.IntersectsRectangle(shape1, rectangle2);  
 if(state==true){  
 System.*out*.println("TRUE");  
 }else{  
 System.*out*.println("FALSE");  
 }  
 }  
  
}

**Output:**

