Software Project 04 (Spring 2023) **Instructor:** *Joon-Woo Lee*
Problem Set 8
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1. We have the following interfaces: Shape and Angular. Additionally, we want to execute the following main method. The implementation classes should consist of four classes as follows. Implement each class accordingly.

   - Circle: A circle with the center at the origin and a radius as a field.
   - Oval: An oval with the center at the origin and two axes lengths, a and b, as fields.
   - Rect: A rectangle with the center at the origin and the horizontal length a and vertical length b as fields.
   - Line: A line segment on the x-axis with a center at a and a length b as fields.

```
public interface Shape {
   final double PI = 3.14;
   void draw();
   double getArea();
   default public void redraw() {
      System.out.print(" --- Redrawing...");
      draw();
   }
}
```

Figure 1: Shape interface

```
public interface Angular {
   void printVertex();
}
```

Figure 2: Angular interface

```
public static void main(String[] args) {
   Shape[] shapeList = new Shape[3];
   shapeList[0] = new Circle(10);
   shapeList[1] = new Oval(20,  30);
   shapeList[2] = new Rect(10, 40);

   for (int i = 0; i < shapeList.length; i++) shapeList[i].redraw();
   for (int i = 0; i < shapeList.length; i++) System.out.println("Area: " + shapeList[i].getArea());

   Angular[] angularList = new Angular[2];
   angularList[0] = new Rect(20, 30);
   angularList[1] = new Line(10, 40);

   for (int i = 0; i < angularList.length; i++) angularList[i].printVertex();
}
```

Figure 3: main Method

```
--- Redrawing... Circle with radius 10
--- Redrawing... Oval with 20x30
--- Redrawing... Rectangle with 10x40
Area: 314.0
Area: 1884.0
Area: 400.0
Vertex: (-10, -15) (10, -15) (-10, 15) (10, 15)
Vertex: (-10, 0) (30, 0)
```

Figure 4: Console window