

L07 - Shapes Lab

In this lab, we'll work with Abstract Classes.

1. Start VS Code.
2. During the lecture we discussed the following classes:
 - `Shape` - an abstract class
 - `Circle` - a class that is derived from `Shape`
 - `Ellipse` - a class that is also derived from `Shape`
3. Using the `Circle` class as a guide and the `Ellipse` slide, finish writing the `Ellipse` class
4. Using the `Circle` class as a guide, write a class called `Rectangle`:
 - extend the `Shape` class
 - define member variables of type `double` for the `width` and `height`
 - create one or more constructors, as appropriate
 - override the `equals`, `toString`, `findArea`, and `findPerimeter` methods
5. Create a new class with the name `ShapeTest`.
6. This is the body of the class `ShapeTest`:

```
public class ShapeTest {  
    public static void main(String[] args) {  
        Shape[] myShapes = new Shape[10];  
        Circle myCircle = new Circle(10.0);  
        double expected = 314.16;  
        System.out.println("Circle Area: " + myCircle.findArea());  
  
        myShapes[0] = new Circle(10.0);  
        expected = 314.16;  
        System.out.println("Circle in Shapes Array Area: " + myShapes[0].findArea());  
  
        myShapes[1] = new Ellipse(5.0, 10.0);  
        expected = 157.08;  
        System.out.println("Ellipse in Shapes Array Area: " + myShapes[1].findArea());  
  
        myShapes[2] = new Rectangle(5.0, 10.0);  
        expected = 50.0;  
        System.out.println("Rectangle in Shapes Array Area: " + myShapes[2].findArea());  
    }  
}
```

When you run the tests, notice that Java knows what particular kind of object (`Circle`, `Rectangle`, or `Ellipse`) has been stored in the array of `Shapes`.

Revision #1

Created 24 April 2025 22:12:03 by Brandon Duke

Updated 24 April 2025 22:12:34 by Brandon Duke