

COP-2210

Computer Programming I

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Text: Big Java: Early Objects, Interactive Edition, 6th Edition

Creating Your Own Classes

29. Getting Started

Definition of a Java Class

General format:

```
<specifiers> class <class name>  
{  
    constructor (s)  
  
    method (s)  
  
    class variables (s)  
}
```

Defining classes

- 1) A source file (.java) can contain any number of classes.
- 2) You can have only one *public* class in a source file.
- 3) The name of the source file must match the name of the public class.
- 4) The compiler creates as many class files (.class) as classes in the source file
- 5) It is common style to put each class in a single file.

Variables in Classes: Types

Variables in a class:

Class/Instance Variables: declared at the class level

Local Variables: declared in methods

(method parameters - behave as local variables also)

Example

```
public class MyClass
{
    public int x, y;

    public double myMethod()
    {
        int z;
        .
        .
        .
    }
}
```

Class variables or
instance variables

Local variable

Variables in Classes: Scope

Scope (portion of the class where an identifier may be used) :

variables can only be used within the closest pair of braces that contain them

(and local variables, after being declared)

Example

```
public class MyClass
{
    public int x, y;

    public double myMethod()
    {
        int z;
        .
        .
        .
    }
}
```

z can be
used
here

x and **y** can
be used
here

Accessing Class Members From Another Class

Access:

members: may be accessed from outside the class by

<object name> . <member name>

Example

```
public class MyClass
{
    public int x;

    public double successor()
    {
        return x+1;
    }
    .
    .
    .
}
```

```
MyClass m = new MyClass();
```

```
m.x = 5;
```

```
sout ( m.successor() );
```

Classes: *Try it yourself*

```
public class Circle
{
    public double radius=1;

    public double area()
    {
        return Math.PI*Math.pow(radius, 2);
    }

    public void printCircle()
    {
        System.out.println("Radius = " + radius + ", area = " + area());
    }
}
```


Classes: *Try it yourself*

```
public class Prog29_01
{
    public static void main(String[] args)
    {
        new Prog29_01();
    }
    public Prog29_01()
    {
        Circle c = new Circle();

        c.printCircle();
        c.radius = 2;
        c.printCircle();
    }
}
```

PRACTICE

Program 29_02:

Write a program that defines and tests a class **Sphere**. In the class there must be a method to find the volume of the sphere and a method to find the surface area of the sphere. Create a tester class **Prog29_02**.

$$V = \frac{4}{3}\pi r^3 \quad A = 4\pi r^2$$

