

### Just a little about Java

**Without object orientation:** Flat space, no structure. Program: list of functions (procedures, subroutines, methods), like a book of recipes.

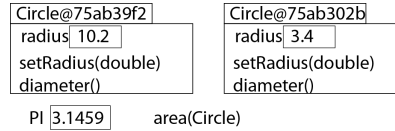
**With OO:** opportunity for more structure. Reuse of code easier, much shorter functions.

Java comes with thousands of functions/procedures for you to use, for I/O, string manipulation, data structures, sorting, searching, dealing with the internet. They are easy to get at and use. Building GUIs (Graphical User Interfaces) becomes easier because of OO structure.

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### Just a little about Java: class Circle



**Two objects:** one in memory at 75ab39f2, other at 75ab302b. Java gave them names Circle@75ab39f2, Circle@75ab302b

Each object contains a *field (variable)* named **radius**, a procedure **setRadius**, and a function **diameter**. Any number of such objects can be created.

Class **Circle** also has a variable **PI** and a function **area**. Only one variable **PI** and one function **area** exists.

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```

/** An instance of Circle represents a circle */
public class Circle {
    private double radius; // Radius of the circle. r ≥ 0.
    public static final double PI= 3.141592653589793;
    /** Set radius of the circle to r. Precondition: r >= 0. */
    public void setRadius(double r) {
        radius= r;
    }
    /** return diameter of the circle. */
    public double diameter() {
        return 2*radius;
    }
    /** return area of Circle c. */
    public static double area(Circle c) {
        return PI * c.radius * c.radius;
    }
}
    
```

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### Download and install Java

Course website tells you how:

<http://www.cs.cornell.edu/courses/CS2110/2014fa/resources.html#Java>

**JRE:** Java Runtime Environment. A java program is compiled into the *Java Virtual Machine Language*, An “interpreter” interprets and actually runs your program.

**JDK:** Java Development Kit. Contains, among other things, the program that *compiles* a Java program.

Downloading and installing the JDK also installs the JRE.

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### Download and install Eclipse

Eclipse: The IDE (Integrated Development Environment we use in this course to write, debug, run Java programs.

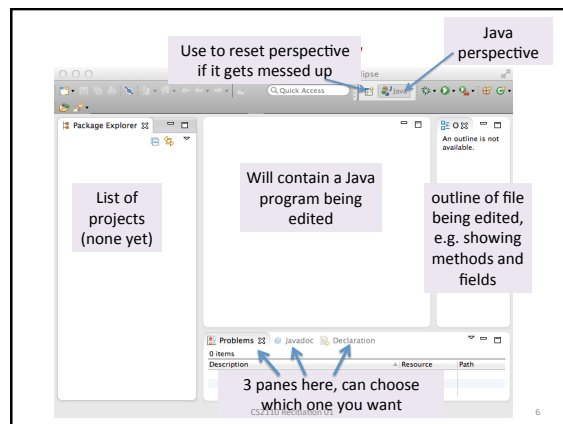
Course website tells you how to install:

<http://www.cs.cornell.edu/courses/CS2110/2014fa/resources.html>

and scroll down.

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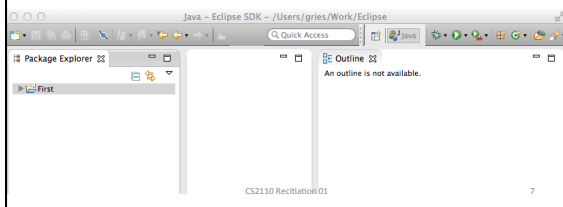
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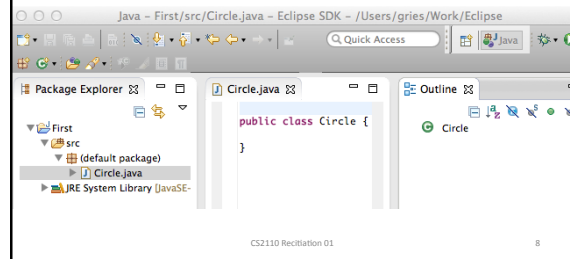
### Add a project

Use menu item File -> New -> Java project.  
 Give it a name, First.  
**Note:** You get to say where the project files go. We suggest putting them in the default place that Eclipse suggests.  
**Note:** Always start a new program in a new project!



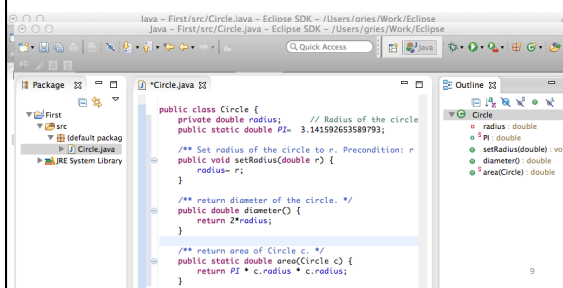
### Add class Circle

Use menu item File -> New -> Class.  
 Give it a name, Circle.  
 Click button Finish



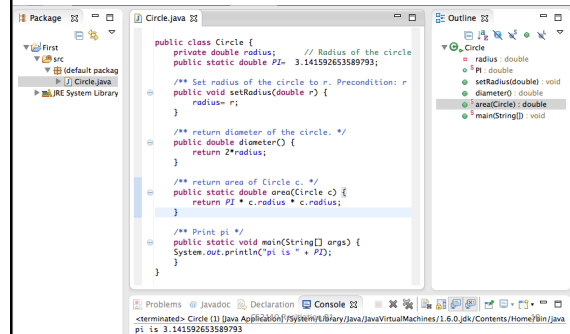
### Put declarations into class Circle

Copy the declarations of components from slide 3 into class circle in the middle pane.



### Running the program

Use menu item Run -> Run. It executes method main.



### Add a .java file by dragging to left column

You may be asked: copy or to link to original?  
**ALWAYS COPY.**  
 So changes don't mess up original

