CO320

Introduction to Object-Oriented Programming

Michael Kölling

Take control of your own learning

- Lecture
- Classes
- Exercises
- Book
- Web page
- Discussion forum
- Study groups
- Practice, practice, practice!

Module web page (CO320)

- News
- Course material
- Slides
- Discussion forum

Classes

Classes in week 1

Course Contents

- Introduction to object-oriented programming…
- …with a strong software engineering foundation…
- …aimed at producing and maintaining large, high-quality software systems.

Buzzwords

responsibility-driven design

inheritance

encapsulation

iterators

overriding

coupling

cohesion

javadoc

interface

collection classes

mutator methods

polymorphic method calls

Goals

- Sound knowledge of programming principles
- Sound knowledge of object-orientation
- Able to critically assess the quality of a (small) software system
- **Able to implement a small software system in Java**

Book

David J. Barnes & Michael Kölling

Objects First with Java
A Practical Introduction using BlueJ

Third edition,
Pearson Education, 2006
ISBN 0-13-197629-X.

Assessment

Course overview

- Objects and classes
- Understanding class definitions
- Object interaction
- Grouping objects
- More sophisticated behaviour - libraries
- Well-behaved objects - testing, maintaining, debugging
- Designing classes

Demo

Fundamental concepts

- object
- class
- method
- parameter
- data type

Objects and classes

- objects
  - represent ‘things’ from the real world, or from some problem domain (example: “the red car down there in the car park”)
- classes
  - represent all objects of a kind (example: “car”)

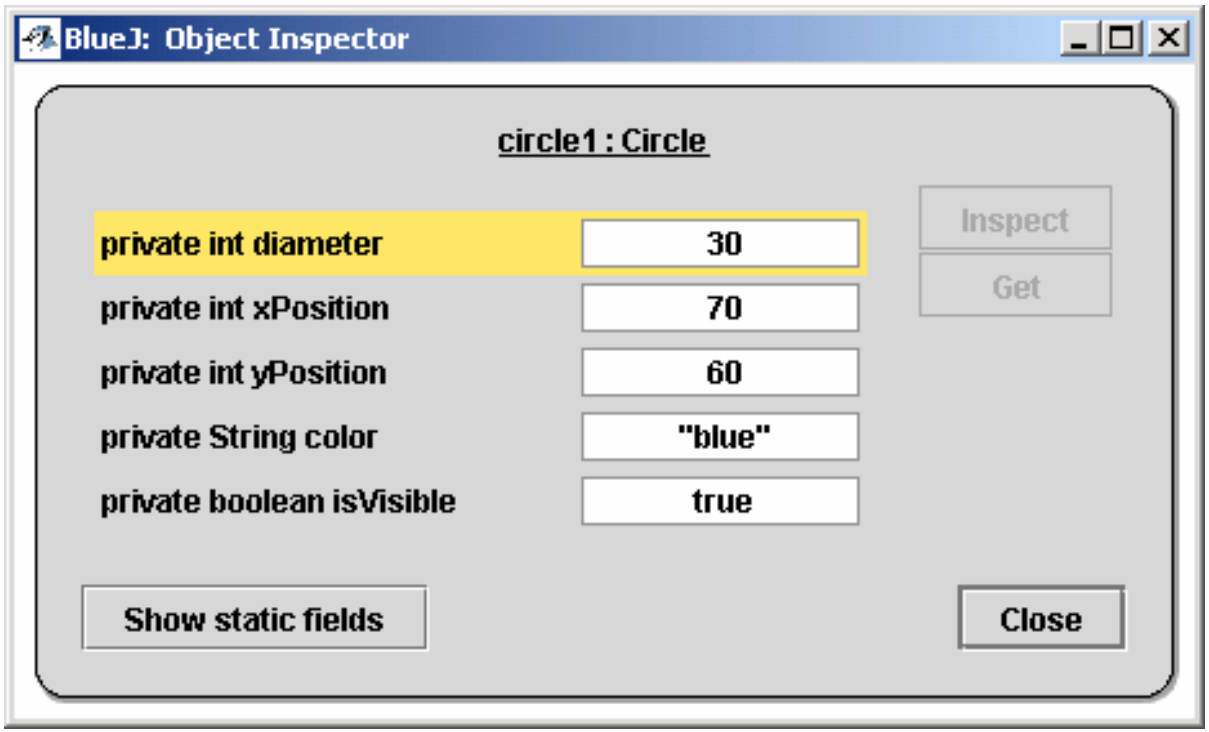
Methods and parameters

- Objects have operations which can be invoked (Java calls them *methods*).
- Methods may have parameters to pass additional information needed to execute.

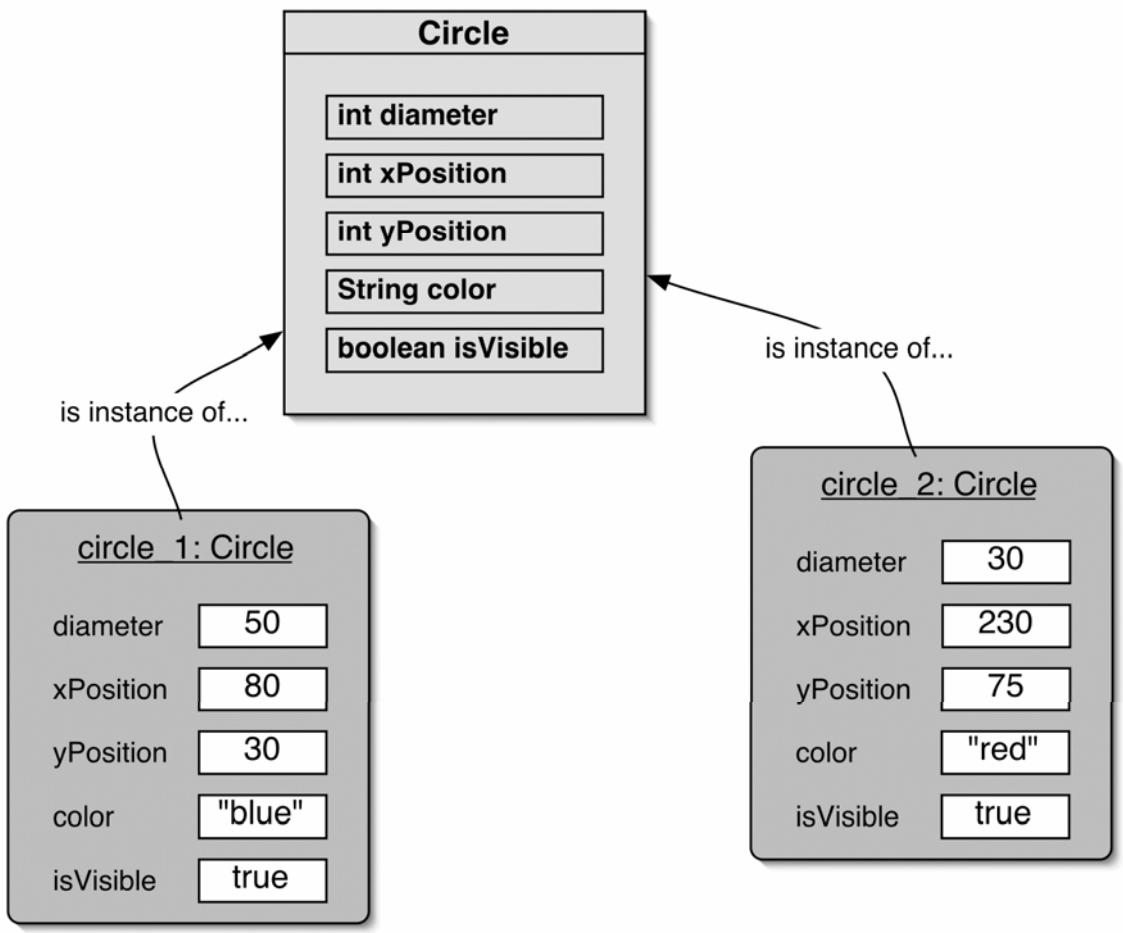
Other observations

- Many *instances* can be created from a single class.
- An object has *attributes*: values stored in *fields*.
- The class defines what fields an object has, but each object stores its own set of values (the *state* of the object).

State


BlueJ: Object Inspector
circle1 : Circle
private int diameter
30
private int xPosition
70
private int yPosition
60
private String color
"blue"
private boolean isVisible
true
Inspect
Get
Show static fields
Close

Two circle objects



Return values

- Methods may return a result via a return value.

Source code

- Each class has source code (Java code) associated with it that defines its details (fields and methods).