The 'static' keyword

25 Jan 2008
CMPT166
Dr. Sean Ho
Trinity Western University

static keyword

    - public static void main(String args[]) {
- static keyword: class attribute
  - Shared by all instances of this class
    - vs. instance attribute: separate for each object
  - Exists before class is instantiated
    - Invoke class methods as: ClassName.method()
- Running a class vs. instantiating a class:
  - Run a class from JRE: java MyClass
    - No instances made, just MyClass.main() invoked
  - Instantiating: new MyClass()
    - Constructor is run, main() is not run

Idioms for Swing programs

- (see FractalTree.java)
- main(): calls createAndShowGUI()
  - In a thread-safe manner: invokeLater()
- createAndShowGUI():
  - Sets up window (JFrame)
  - Instantiates panel (JPanel, FractalTree)
    - This calls constructor
- FractalTree() constructor:
  - Creates widgets, layout
- actionPerformed() callback

The “this” reference

- this refers to the current instance
  - Not always necessary in Java
  - Use to distinguish between local variable/parameter and instance/class attribute

```
public class Complex {
    double real, imag;
    public Complex() { real = 0.0; imag = 0.0; }
    public Complex( double real, double imag ) {
        this.real = real;
        this.imag = imag;
```

  - Can't use in static methods (why?)

static import

  - import static java.lang.Math.*;
- Import all static members of a class
- New feature in Java 1.5 (J2SE 5.0)
- Brings static variables/methods into current namespace:
  - sqrt(36.0); instead of Math.sqrt(36.0);
  - log(E); instead of Math.log(Math.E);
- Can also bring in one particular member:
  - import static java.lang.Math.sqrt;

Implementing Abstract Classes

- Abstract classes
  - Not meant to be directly instantiated
  - Make a subclass and instantiate that
  - May define virtual methods with empty or non-useful bodies
    - Subclass overrides virtual method with own implementation
- Everything is a subclass of java.lang.Object
  - toString(): virtual method, used by System.out.print()