

Classes and Methods

Write a class called C1 containing:

- A static variable SV of type **int**.
- A static method SM with one parameter, of type C1, and a **void** return type.
- A constructor with no parameters which does nothing.
- An instance method IM with no parameters, an **int** return type, and a local variable LV of type C1.

Object Creation, Method Invocation

Write a class C2 having a main method which:

- Creates an object of type C1 (previous slide) and assigns it to variable V.
- calls method SM with V as its argument.
- Sends message IM to V and prints out the returned value.

Messages

Suppose class C3 has a static method S3() and an instance method I3(), and class C4 has a static method S4(), an instance method I4(), and a static variable V4 whose type is C3.

1. What message(s) can be sent to the object bound to V4?
2. Write an expression that sends a message to the object bound to V4.
3. If you wanted to be able to send another message, M(), to the object bound to V4, where would you put method M?

What is wrong?

```
public class C5 {
    public static Integer M5(int i) {
        Integer x = this.M6(i);
        return x ;
    }

    public Integer M6(int w) {
        return new Integer(w);
    }
}
```

Can you tell the type of “this”?

```
public class C6 {  
  
    public void M8(String s) {  
        System.out.print(this.M7(s.trim()) );  
    }  
  
    public Integer M7(String t) {  
        String s = t.toUpperCase();  
        return s ;  
    }  
}
```

Exercises about previous slide

- Write a main method that
 - Bind the String object “Fred” to variable X.
 - Create an object capable of receiving the M8 message, bind it to variable V, and send it the M8 message with X as its argument.
 - Print out X.
- Trace the execution of your program.

Identify the local variables and parameters

```
public class C7 {  
  
    public String M9(String s, String t) {  
        String a ;  
        a = this.M10(s) ;  
        String b = this.M10(t) ;  
        t = a.concat(b) ;  
        return t ;  
    }  
  
    public String M10(String t) {  
        String s = t.toUpperCase();  
        return s ;  
    }  
}
```

a.concat(b) creates a new String with a copy of a followed by a copy of b

Exercises about previous slide

- Write a main method that
 - Bind the string object “ sss” to variables, and “ tt” to variable t.
 - Create an object capable of receiving the M9 message, binds it to variable V, sends it the M9 message with s and t as its arguments, and stores the result in variable Y.
 - Prints out X.
- Trace the execution of your program.
 - What are the initial bindings of the local variables the second time M10 is invoked?
- Would anything be different if the main method put the arguments s and t in the opposite order?

Write a few lines of code that...

- Create an Integer object, bind two variables to the object, and then change one of them so that it is bound to no object.

Trace this

```
String s = "aaa" ;  
System.out.println(s.length());  
s = "" ;  
System.out.println(s.length());  
s = null ;  
System.out.println(s.length());
```