

COMP 110/L Lecture 8

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Slides are adapted from Dr. Kyle Dewey

Outline

- `public / private`
- “Getters” and “Setters”
- `toString()` method
- **Memory representation**

public / private

public

Means it can be accessed from anywhere

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```
public class PublicClass {  
    public int i;  
    public PublicClass(int x) {  
        i = x;  
    }  
    public void printI() {  
        System.out.println(i);  
    }  
}
```

Example

- `PublicClass.java`
- `PublicClassMain.java`

private

Means it can be accessed from **only** within the class

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```
public class PrivateClass {  
    private int i;  
    private PrivateClass(int x) {  
        i = x;  
    }  
    private void printI() {  
        System.out.println(i);  
    }  
}
```


Example

- `PrivateClass.java`
- `PrivateClassMain.java`

Why public/ private?

- Intentionally allows / disallows certain interactions between objects
- If you allow your objects to have public states, then any piece of code can change your state!
- Stove example: perhaps only the stove can turn its burner on - make it `private`
- Commonly used to force changes to instance variables to go through methods (much more predictable)

“Getters” and “Setters”

Getters

Methods that return the value of an instance variable.

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```
public class HasGetter {  
    private int saved;  
    public HasGetter(int x) {  
        saved = x;  
    }  
    public int getSaved() {  
        return saved;  
    }  
}
```

Example:
`HasGetter.java`

Setters

Methods that change the value of an instance variable.

The instance variable is generally `private`.

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```
public class HasSetter {  
    private int saved;  
    public HasSetter(int x) {  
        saved = x;  
    }  
    public void setSaved(int to) {  
        saved = to;  
    }  
}
```


Example:
`HasSetter.java`

Getter / Setter Purpose

- Access to instance variables forced to occur only via `get*` and `set*` methods
- These are the **only** points where change can occur
 - Much easier to predict and debug

toString () **Method**

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Method used to convert an object to a `String`.

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```
public class HasToString {  
    private String held;  
    public HasToString(String s) {  
        held = s;  
    }  
    public String toString() {  
        return held;  
    }  
}
```

Example:

HasToString.java

Memory Representation

On new

Each use of `new` creates a new object in memory.

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new Foo();  
new Bar();
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In Memory



What `new` Returns

- `new` returns a *reference* to the created object
- References can be copied just like `int`, `double`, etc.
- Copying a reference does **not** copy the underlying object

– This is the difference between copying a house and copying an address.
– References act like addresses (and some languages even call them addresses!)

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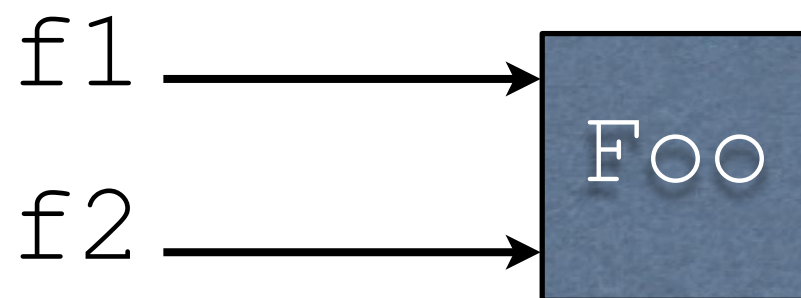
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Foo f2 = f1;
```

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