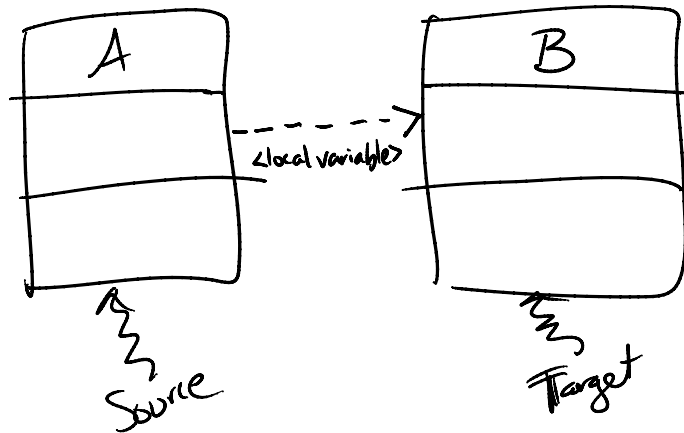


Local Variable Dependency - UML



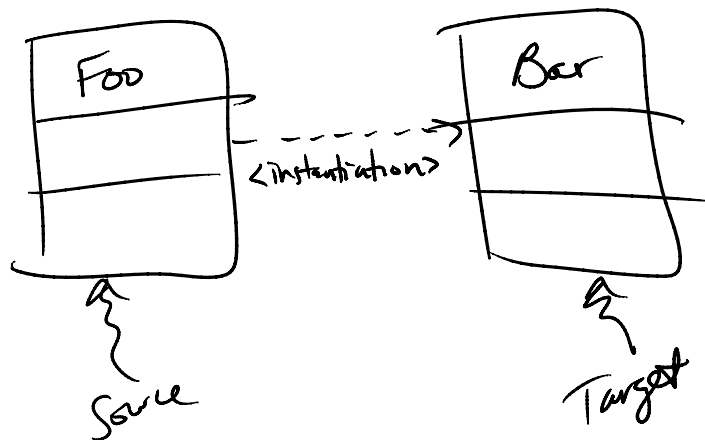
Local Variable Dependency - Code

```
public class A {
    public A ( ) {
        B b = new B();
        B b;
        b = new B();
    }
}
```

Local Variable Dependency - Reason

- One object needs to create another
- Need a local variable to hold the instance

Instantiation Dependency - UML



Instantiation Dependency - Code

```
public class Foo {  
    public Foo () {  
        new Bar();  
    }  
}
```

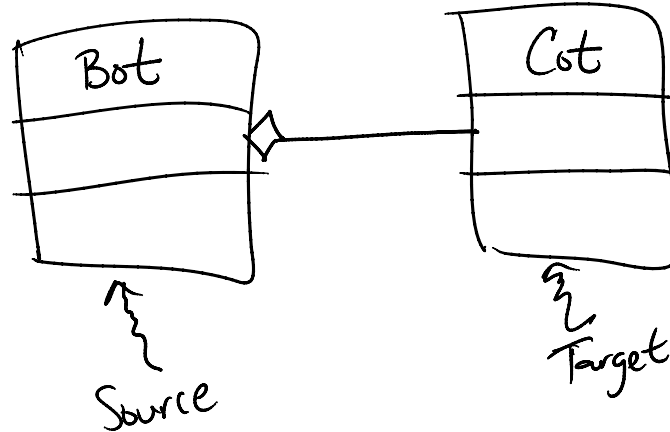
Instantiation Dependency - Reason

→ Need to create an instance

→ No local variable needed

* Creating listeners

Composition - UML



Composition - Code

```

public class Bot {
    private Cot -cot;
    public Bot ( ) {
        -cot = new Cot();
    }
}

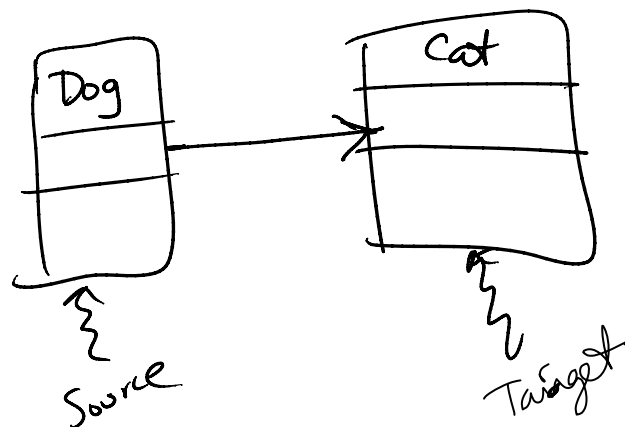
```

Composition - Reason

- Need to create an instance
- Need the instance variable
b/c multiple methods need to refer
to the same object

Lab 4: drawing canvas

Association - UML



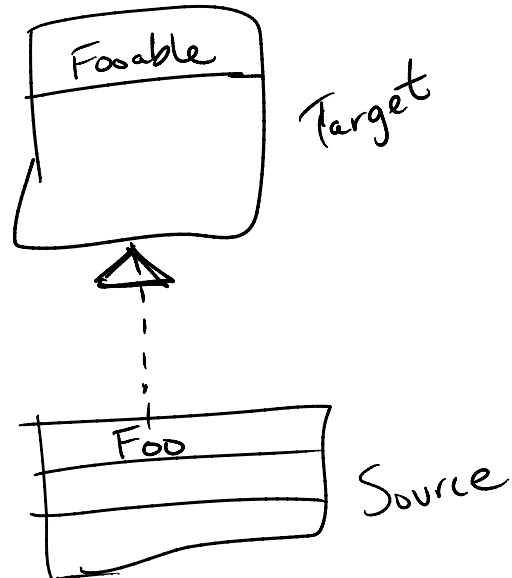
Association- Code

```
public class Dog {  
    private Cat -peckyCat;  
    public Dog (Cat cat) {  
        -peckyCat = cat;  
    }  
}
```

Association - Reason

→ One object needs to communicate with another object that already exists in the system

Realization- UML



Realization - Code

```
public class Foo implements Fooable {
    public Foo (    ) {
    }
}
```

Realization - Reason

(For now)

It's because the library told
me I had to

Last problem

- The steps to create a JButton that changes the color of the background of a drawing canvas to a random color.

Last problem

- Create new instance of a JButton
- Add an action listener to the JButton
- Add the button to the container that will put it on the JFrame

Last problem

- What does the action listener for the button do?
 - It changes the color of the drawing canvas

Last problem

- How do we accomplish that?
 - We need to be able to call `setColor` on the drawing canvas
 - But, we can not directly access the drawing canvas from the listener class
 - We need an association relationship between the listener and drawing canvas