Interfaces

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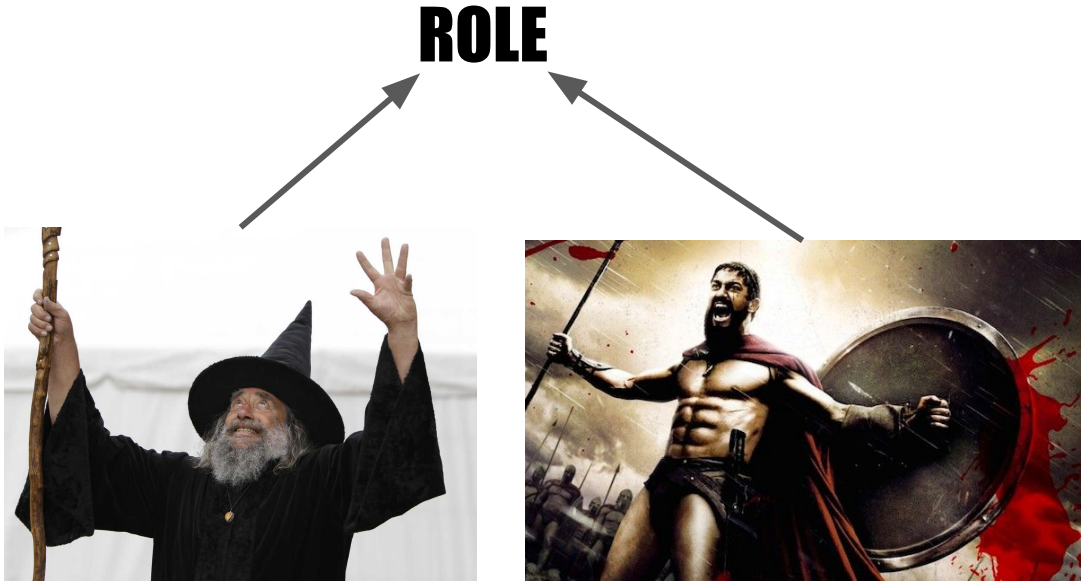
Java

What if we wanted to a Warrior or Wizard? But reference them the same?

We want to have a variable in our program that holds objects from different classes. There are many ways to do this in Java.



We are going to explore
interfaces to do this

What is an interface?

An interface is a specification of the methods that an object must support.

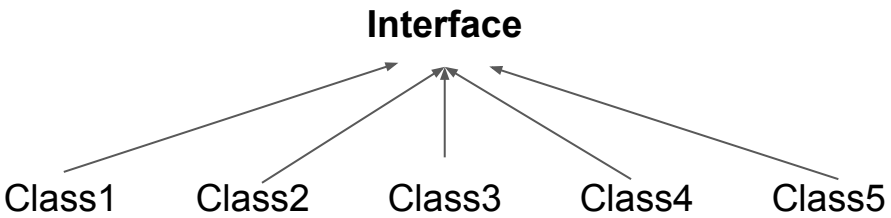
What does that mean???

What is an interface?

In essence, it’s what the slides have been defining for you!

An interface is:

An outline of what methods should be implemented in the class that succeeds it.

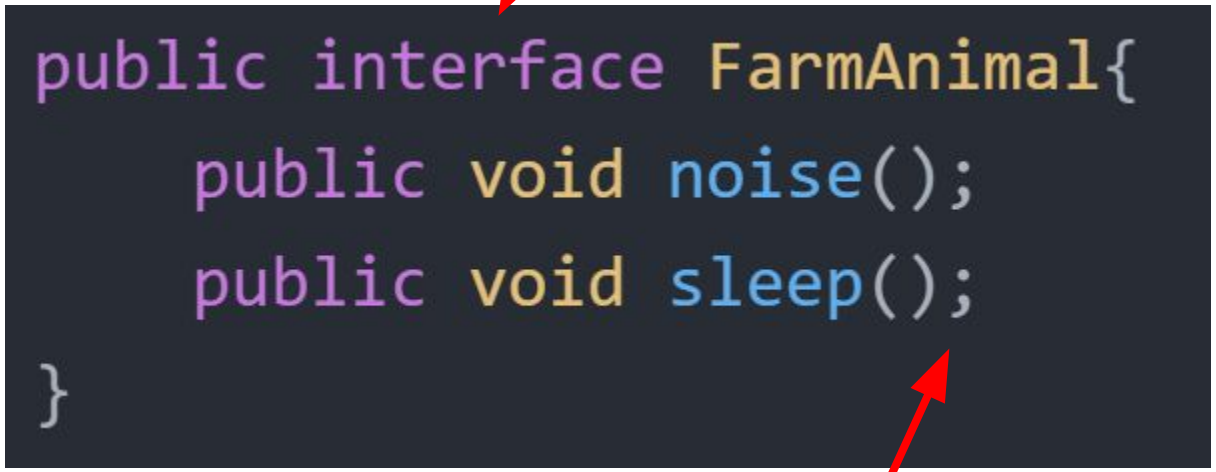


Let’s look at one!

Usually “class” goes here

Just like a class!

Doesn’t implement the methods themselves, **just outlines**



Spooky semicolon!

What if this were a class?

```java
public interface FarmAnimal{
    public void noise();
    public void sleep();
}
```

```java
public class FarmAnimal{
    public void noise(){
        System.out.println("NOISE");
    }
    public void sleep(){
        System.out.println("The animal sleeps");
    }
}
```

Compare the differences between the two.

So how do we know our class uses an interface?

```
public class Chicken implements FarmAnimal{

}
```

New Keyword “implements”

```
public interface FarmAnimal{
    public void noise();
    public void sleep();
}
```

Since Chicken implements FarmAnimal
Chicken **MUST** have the methods outlined

```java
public class Chicken implements FarmAnimal{
    public void noise(){
        System.out.println("BWAK");
    }
    public void sleep(){
        System.out.println("The chicken sleeps");
    }
}
```

```java
public interface FarmAnimal{
    public void noise();
    public void sleep();
}
```

Since Chicken implements FarmAnimal
Chicken **MUST** have the methods outlined,
though they can be different

```
public class Chicken implements FarmAnimal{
    public void noise(){
        System.out.println("BWAK");
    }
    public void sleep(){
        System.out.println("The chicken sleeps");
    }
}
```

```
public interface FarmAnimal{
    public void noise();
    public void sleep();
}
```

Where does the interface go in your folder?

It should be inside your package!
Call package pkg at the top!

pkg
    FarmAnimal.java
    Chicken.java
    Duck.java
starter.java

```java
package pkg;
import java.util.Scanner;
import java.util.Random;

public interface FarmAnimal{
    public void noise();
    public void sleep();
}
```

Now how to use it!

In your main, now you can reference two classes within the same variable!

Don’t be afraid to try it with arrays!

```
FarmAnimal x = new Chicken();
FarmAnimal y = new Duck();
x.noise();
y.noise();
```

Lab: Role Interface

Create the Role interface.

1. Wizard and Warrior implements Role
2. Your personal role should also implement Role
3. Figure out what methods should be outlined
    a. You now can have **1 attack method.**

In main

1. Create a Role array of size 3.
2. Create three different objects inside
3. Print all of their names/art