

Section 4:

Interfaces and Parsing Data

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Classes, Objects, and Java

Everything (save primitives) is an instance of a class

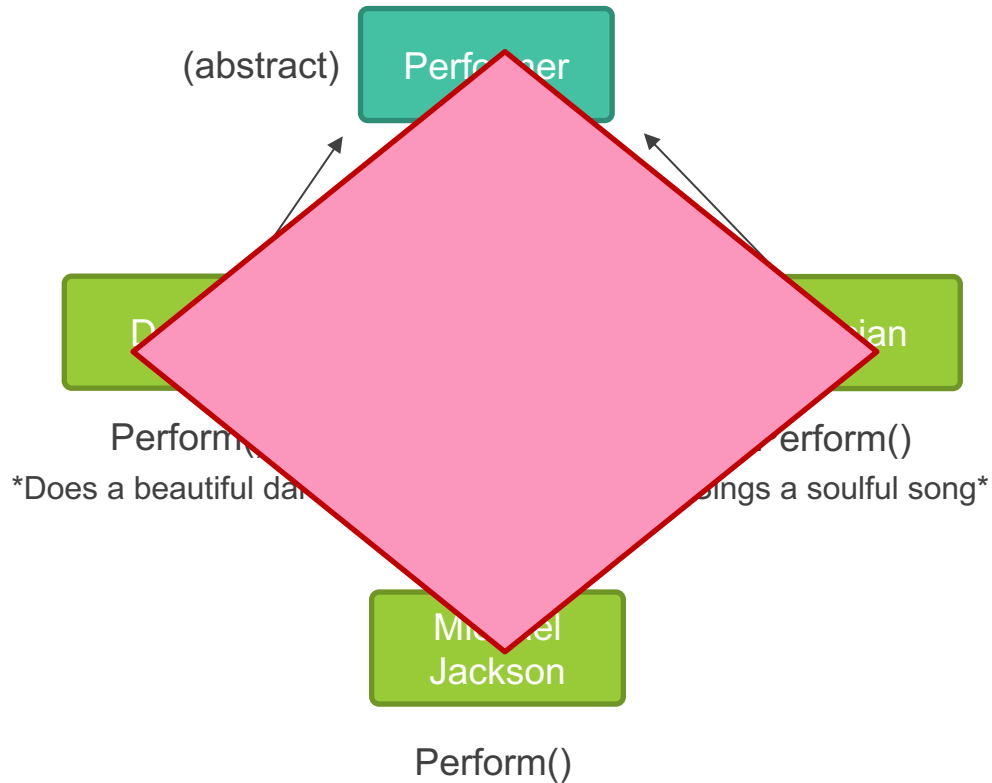
- Defines data and operations

Every class is part of the same type hierarchy

- All extend one specified class or Object
- Inherits superclass fields

Every class also defines a type

Problems with Inheritance



What happens when we call Michael Jackson's perform()?

Interfaces: Like Skeletons!

Pure type declaration

```
public interface Comparable {  
    int compareTo(Object other);  
}
```

Can contain:

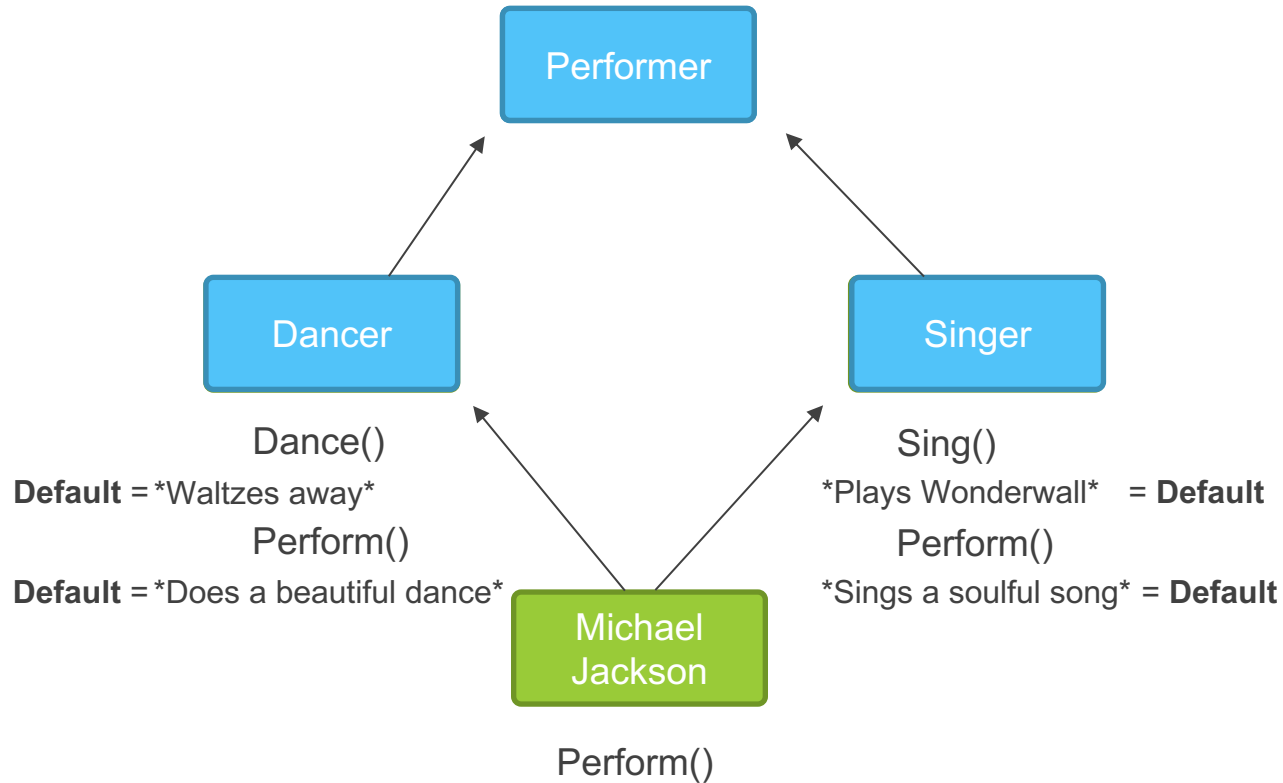
- Method specifications (implicitly `public`)
- Named constants (implicitly `public final static`)
- New to Java 8, `default` method implementations

Not normally used for implementation!

Cannot create instances of interfaces
(similar to abstract classes)



Michael Jackson's Situation?



Implementing Interfaces

- A class can implement one or more interfaces
`class Kitten implements Pettable, Huggable`
- The implementing class and its instances have the interface type(s) as well as the class type(s)
- The class must provide or inherit an implementation of all methods defined by the interface(s)
 - Not true for abstract classes



Interface Ideas?

Using Interface Types

- An interface defines a type, so we can declare variables and parameters of that type
- A variable with an interface type can refer to an object of any class implementing that type

```
List<String> x = new ArrayList<String>();  
void sort(List aList) {...}
```


Guidelines for Interfaces

- Provide interfaces for significant types and abstractions
 - Think about the “is-a” relationship
- Write code using interface types like Map instead of HashMap and TreeMap wherever possible
 - Allows code to work with different implementations later on
 - Clarifies what the code makes use of
- Both interfaces and classes are appropriate in various circumstances

What about Abstract Classes?

Why might you want to use an Abstract Class instead of an Interface?

Parsing Data

- We'll look at examples using CSV