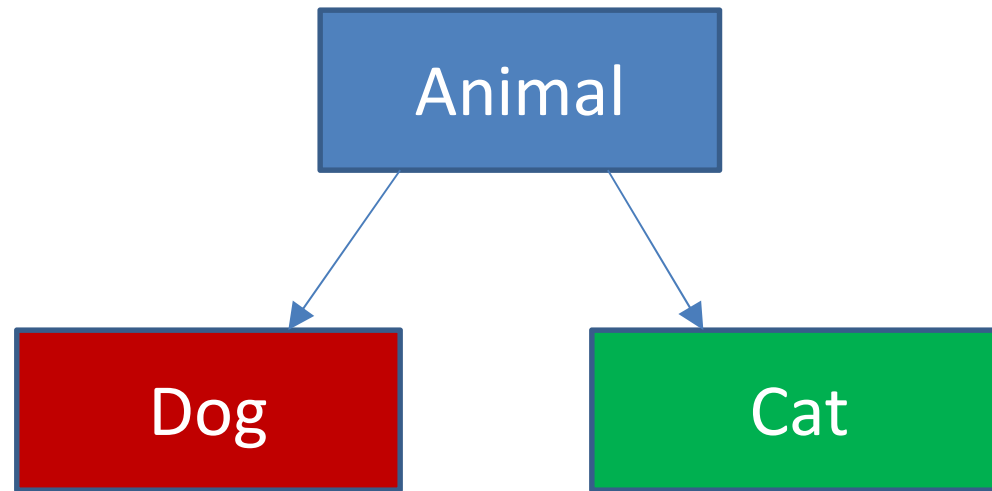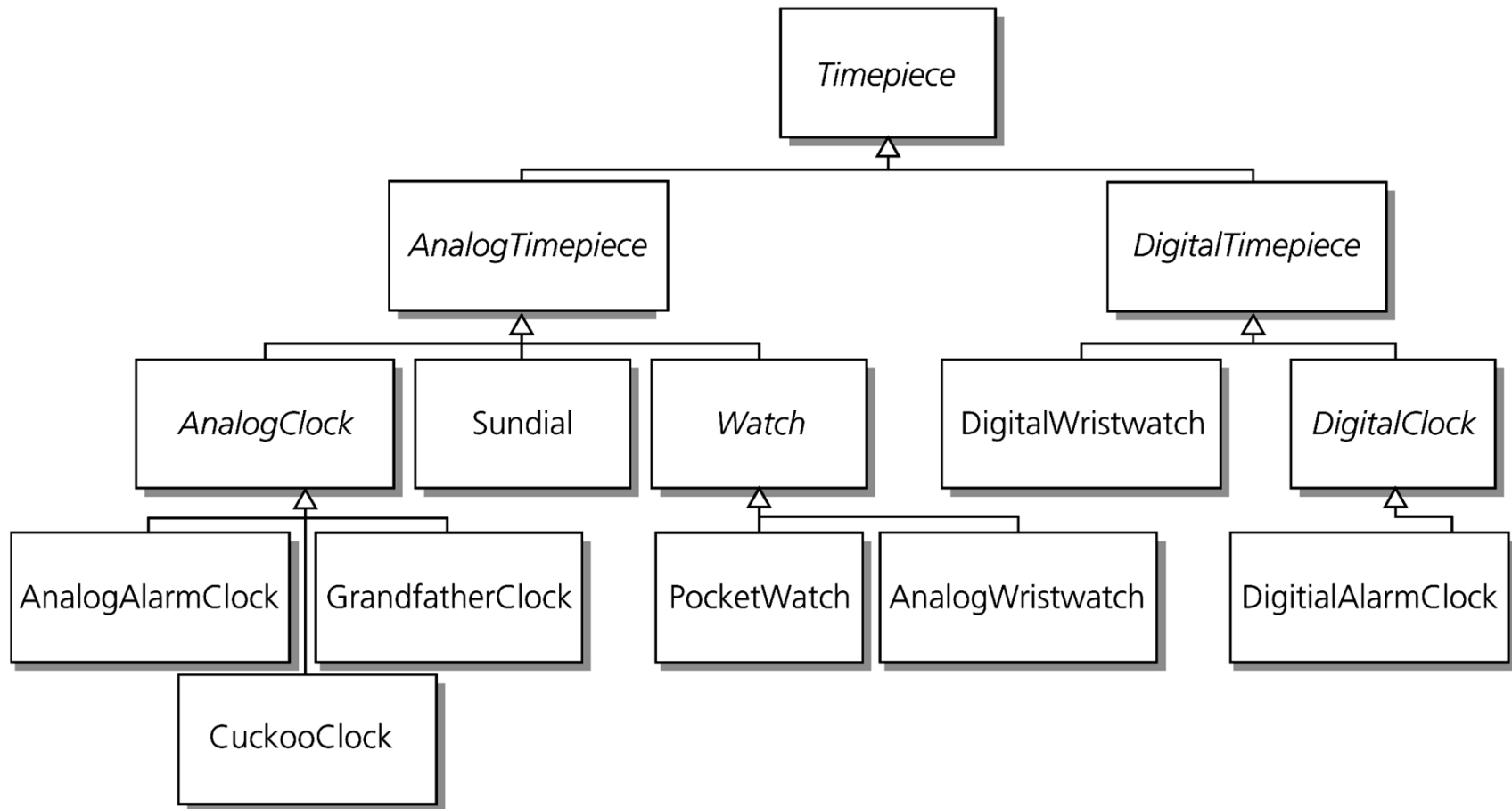# Inheritance Examples

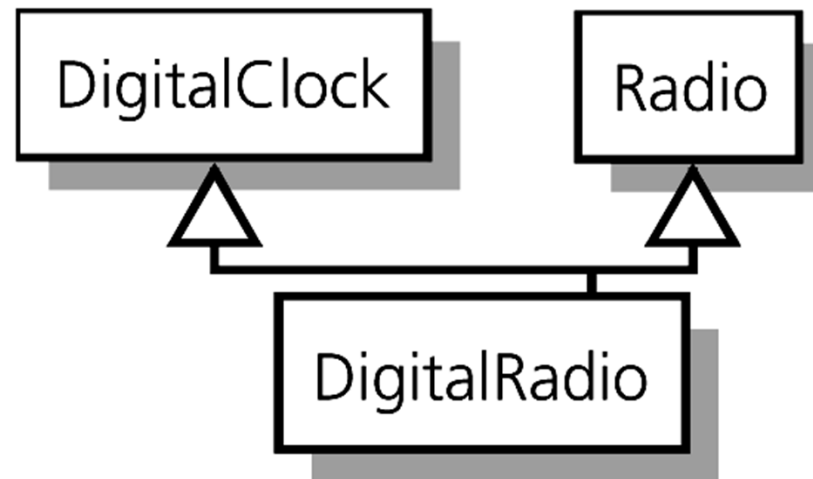# Real-world Examples: Animals

Source code: http://en.wikipedia.org/wiki/Polymorphism_in_object-oriented_programming

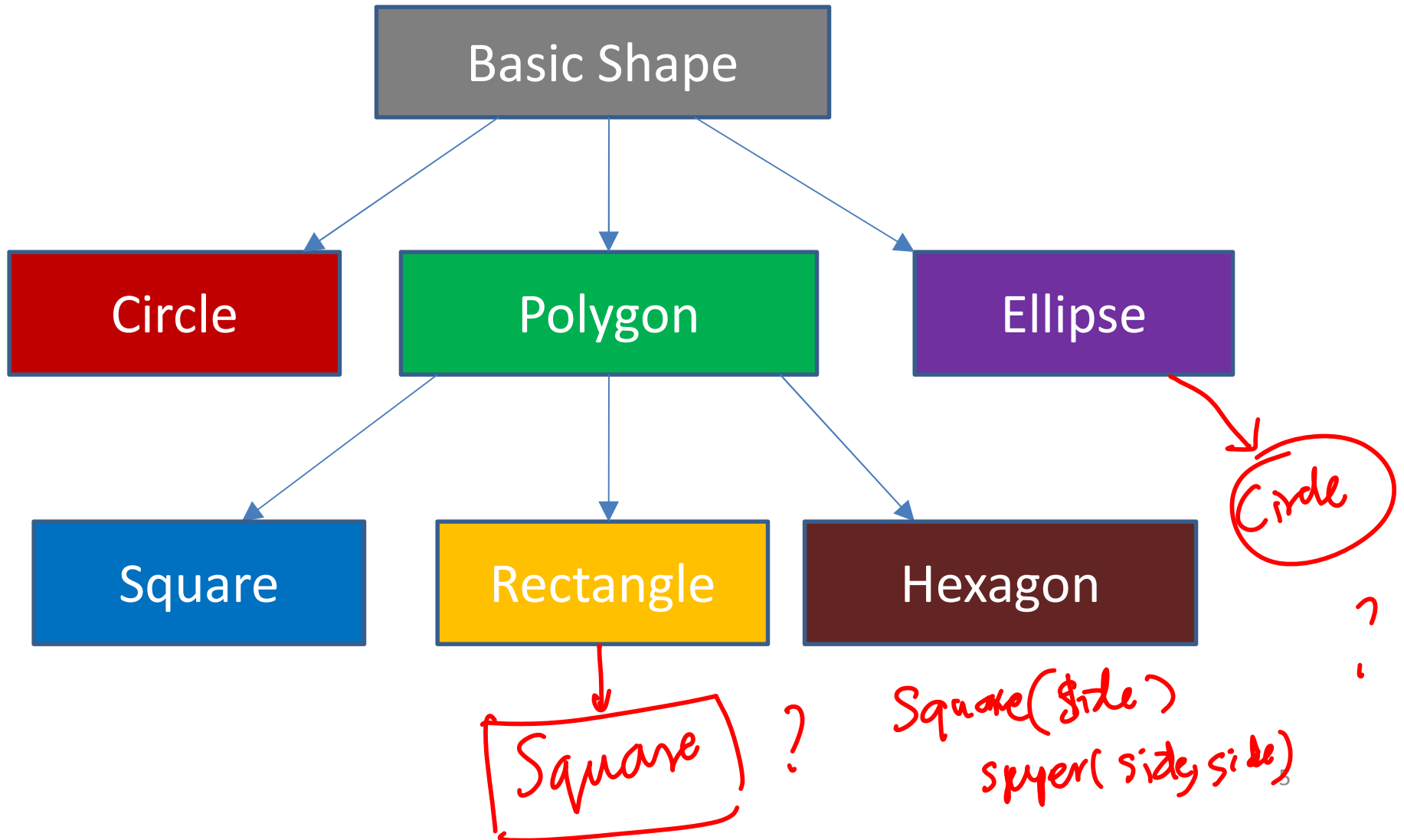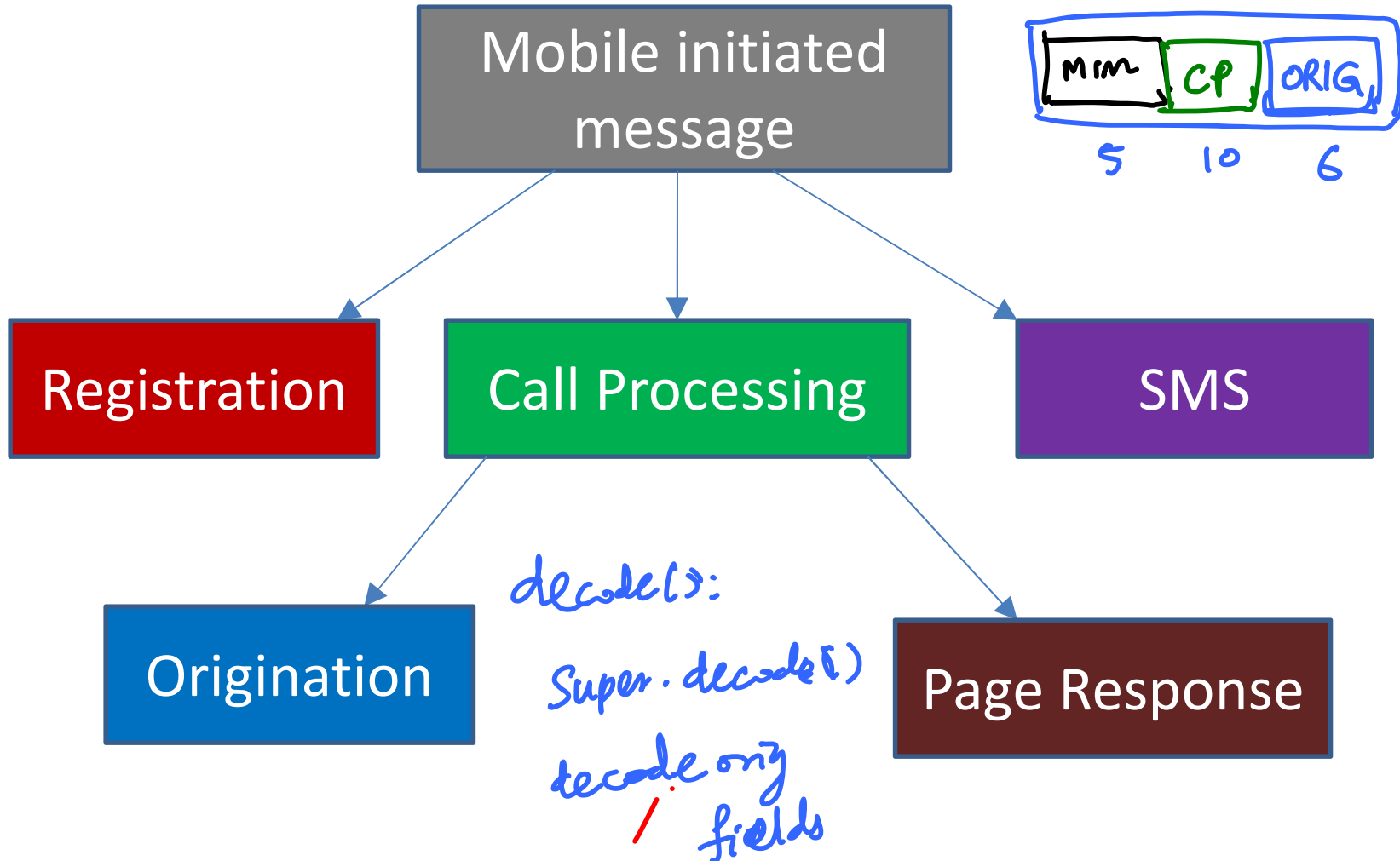# Example #2: Timepieces

Multiple inheritance

– A derived class can have more than one base class

– Java does not support it – uses "interface" instead.

Example #3: Shapes

Example #4: Wireless Telephony

Mobile initiated message

| MIM | CP | ORIG |
| 5 | 10 | 6 |

Registration

Call Processing

SMS

Origination

decode():

super.decode()
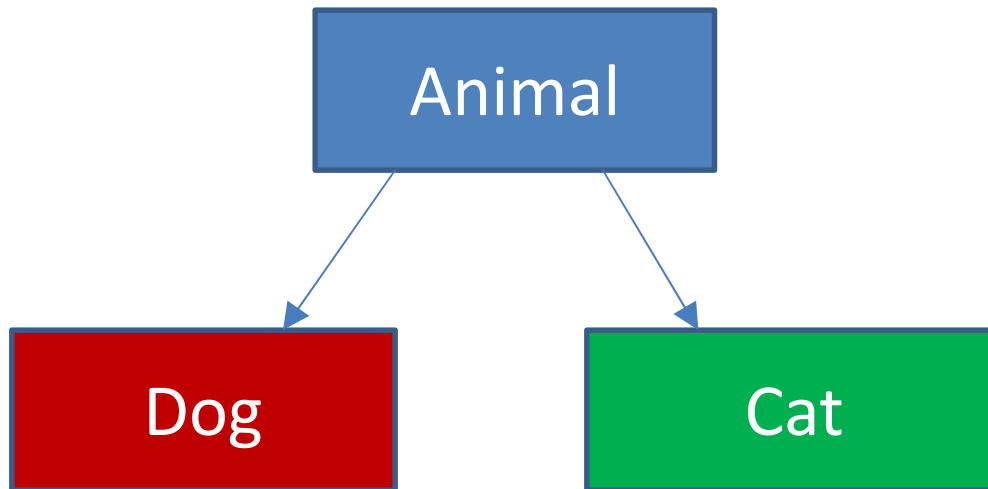
decode orig
fields

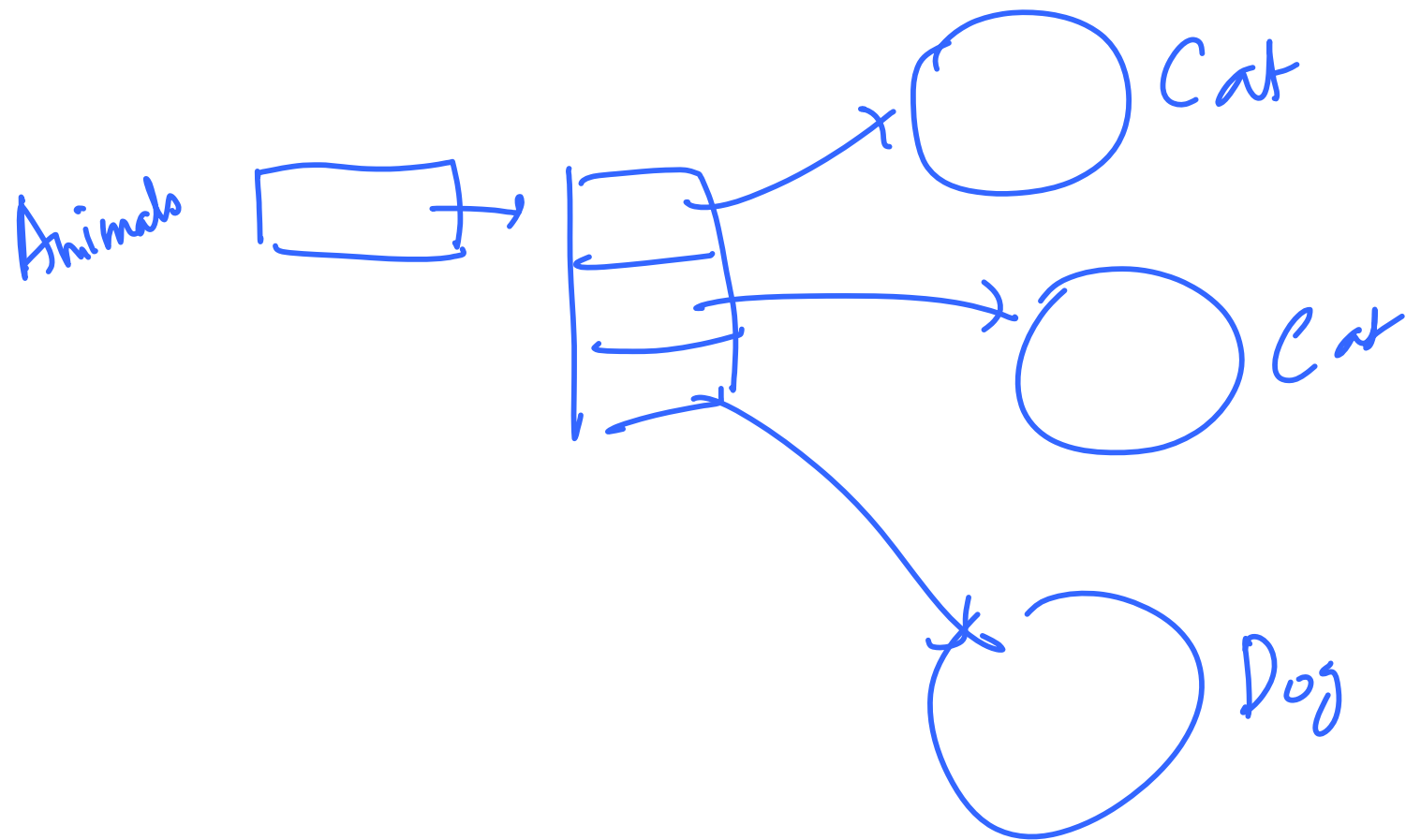Page Response

Value of inheritance?

- Helps us to break software into manageable pieces

- Existing classes can be morphed to design new classes – code reuse

- Enables us to group different types of objects together and do some action on all of them.

Inheritance Examples in Java and C++
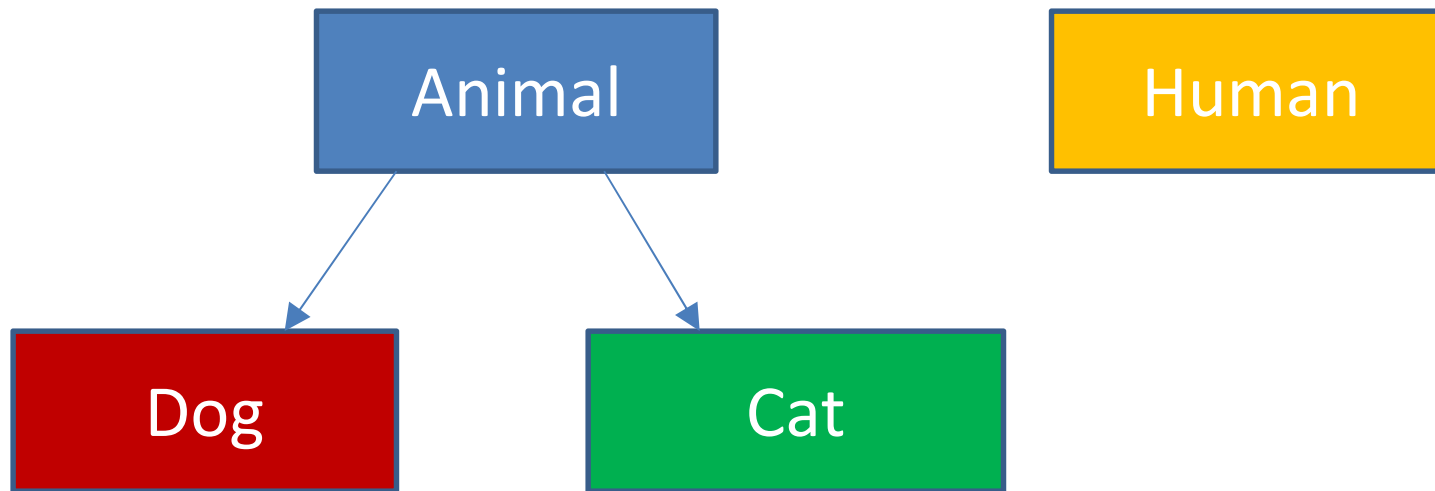
Back to Example #1: Animals

Want to group them together & make them talk?

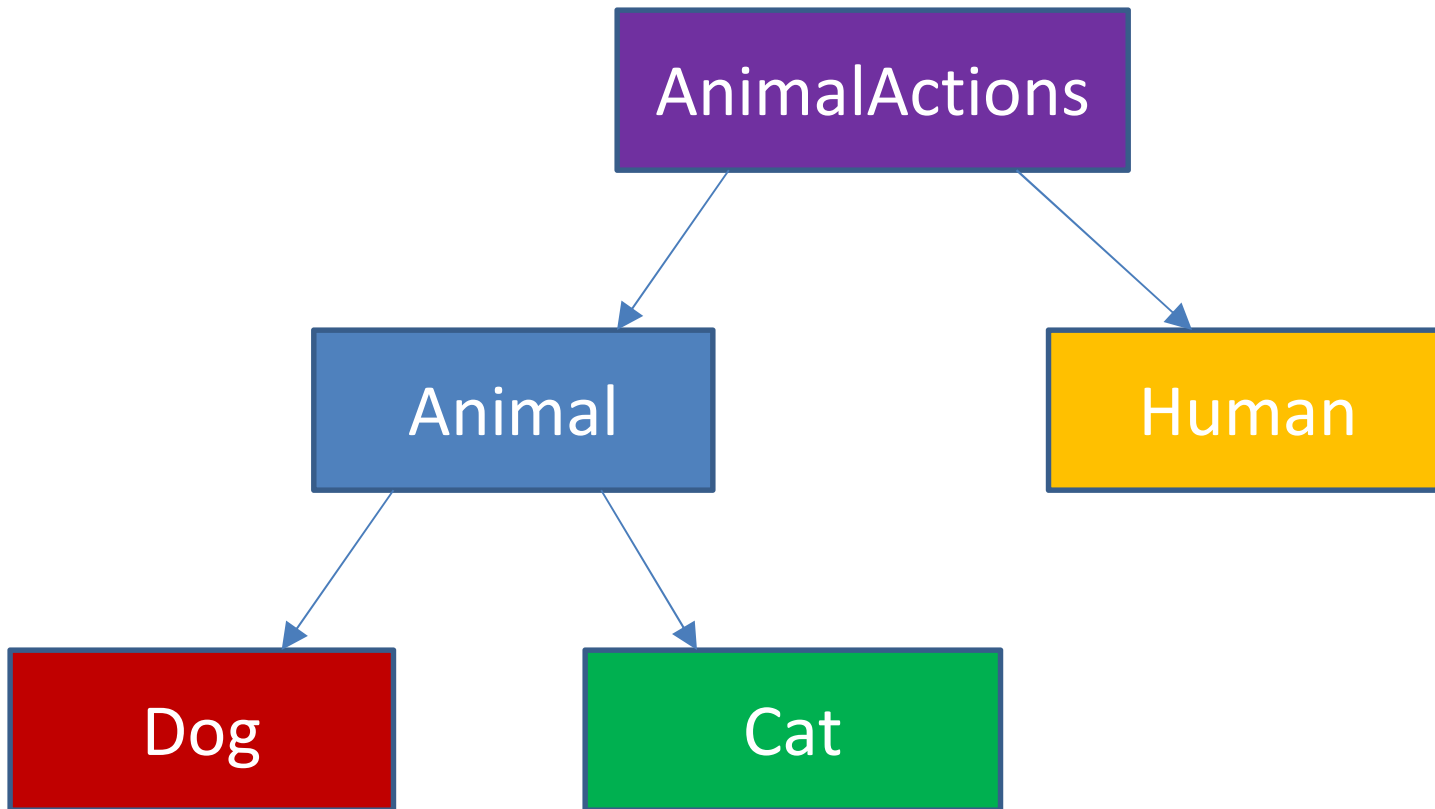Animals [ ] → [ ] → Cat

→ Cat

→ Dog

Concepts

- Static binding vs. dynamic binding
- Polymorphism using virtual methods
- Abstract base class
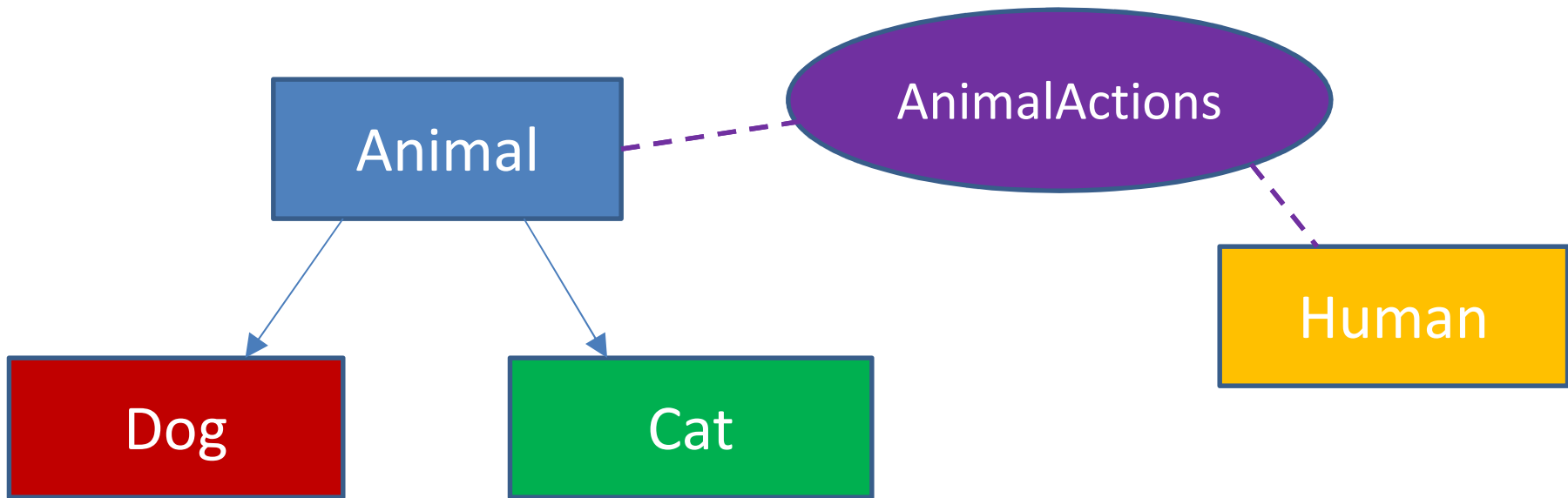- Ability of base class pointers to point to derived class objects

Add Human?

```
               Animal                        Human
              /      \
           Dog        Cat
```

Want to group them together &
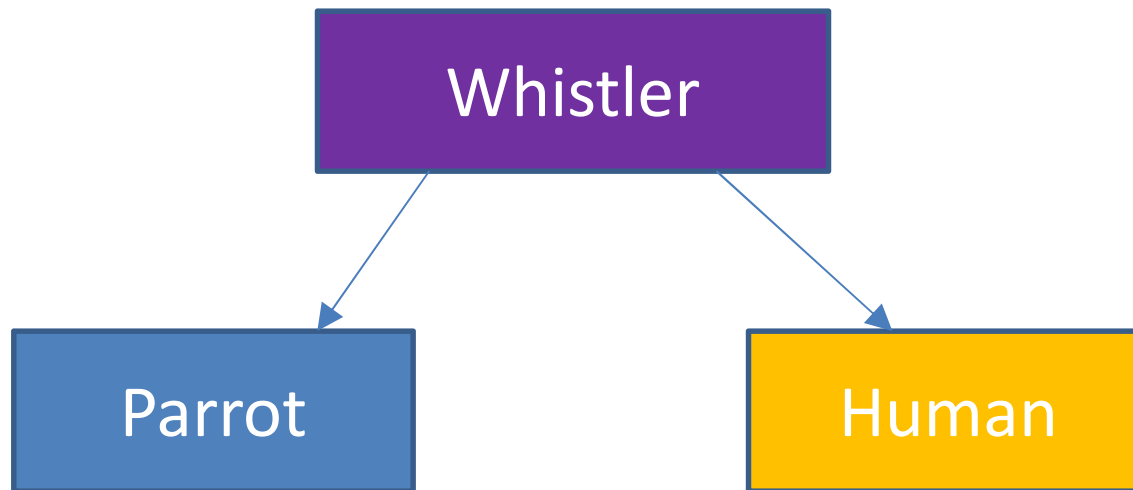make them talk?

C++

Java: Interface
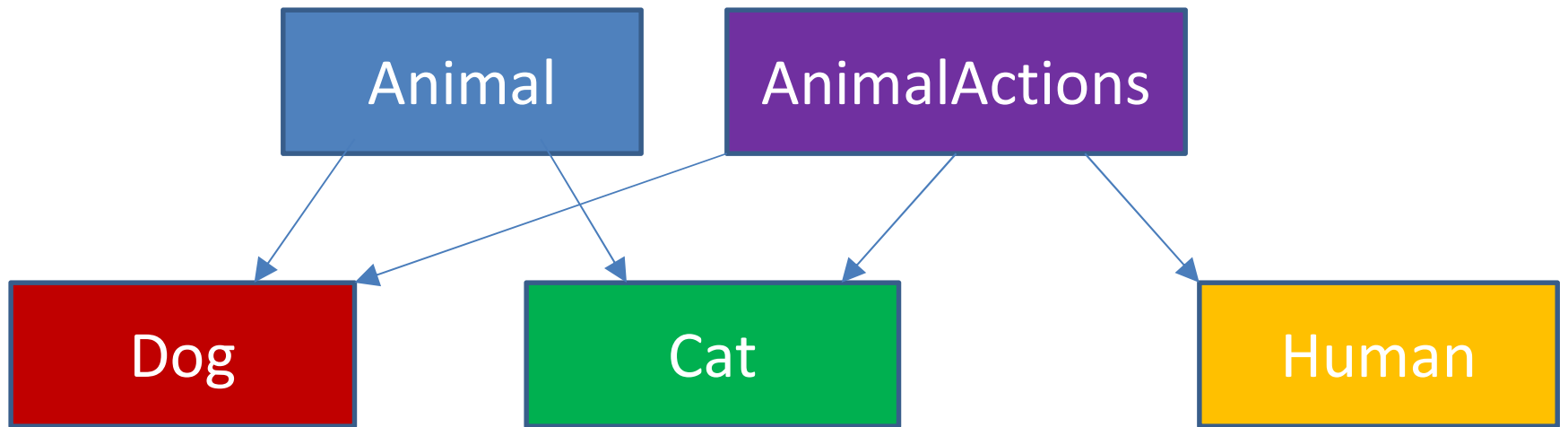
Example from Wiki:
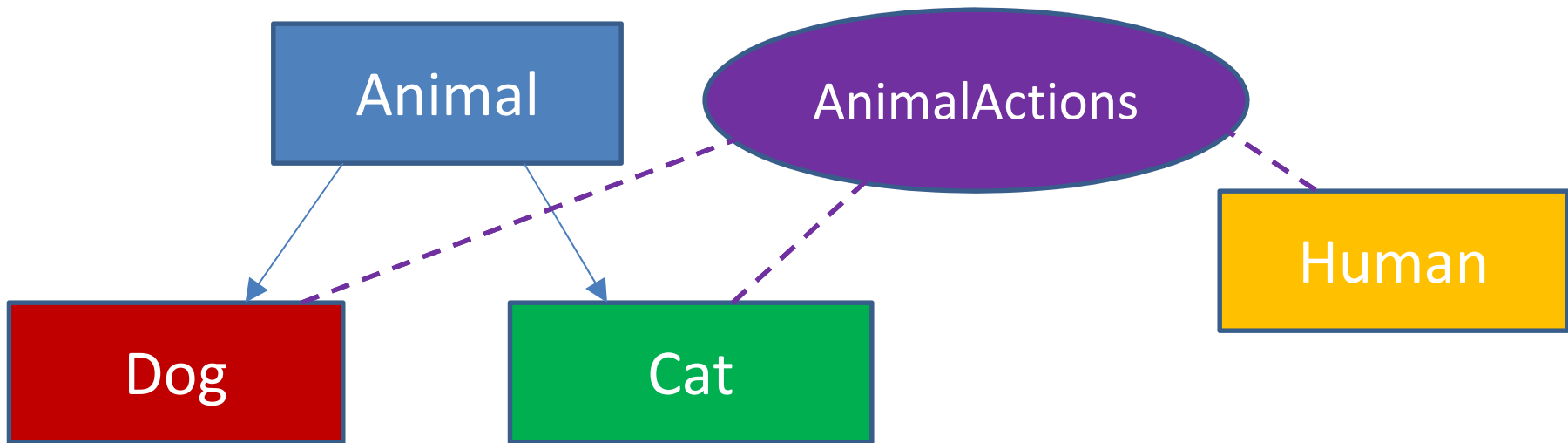# Bad use of Inheritance

Example from Wiki

Concepts

- Interface

C++

Java: Interface

Inheritance Examples in Java and C++

References

- http://en.wikipedia.org/wiki/Polymorphism_in_object-oriented_programming - Animals : Inheritance coding examples in Java/C++/…
- http://en.wikipedia.org/wiki/Interface_%28Java%29 – Java Interfaces

(5)

10
7
100
92
36

10
7
100
92
36
-1

int numbers[] = new int [numItems];