Inheritance Examples
Real-world Examples: Animals

Example #2: Timepieces

- Timepiece
  - AnalogTimepiece
    - AnalogClock
      - AnalogAlarmClock
      - CuckooClock
    - GrandfatherClock
  - Sundial
  - Watch
    - PocketWatch
  - DigitalWristwatch
  - DigitalTimepiece
    - DigitalClock
      - DigitalAlarmClock
Multiple inheritance

– A derived class can have more than one base class
– Java does not support it – uses “interface” instead.
Example #3: Shapes

- Circle
- Polygon
- Ellipse
- Square
- Rectangle
- Hexagon
Example #4: Wireless Telephony

- Mobile initiated message
  - Registration
  - Call Processing
  - SMS
  - Origination
  - 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?
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?

Want to group them together & make them talk?
C++

AnimalActions

Animal

Dog

Cat

Human
Java: Interface

Animal

Dog

Cat

AnimalActions

Human

AnimalActions
Example from Wiki: Bad use of Inheritance

Whistler

Parrot

Human
Example from Wiki

Parrot  Whistler  Human
Concepts

• Interface
C++

Animal

Dog

Cat

AnimalActions

Human
Java: Interface

- Animal
  - Dog
  - Cat
- AnimalActions
- Human
Inheritance Examples in Java and C++
References