CS 251
Intermediate Programming
Interfaces and Enums

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What is an interface?

• A contract between a class and the outside world.

• A class that implements an interface promises to provide the behavior published by that interface.

• Similar to a class, contains
  • constant definitions
  • method signatures
  • *not method bodies!*

• Interfaces cannot be instantiated.

• Can be used as a type.
public interface MyInterface {

    // Constants in an interface are implicitly public static and final
    double MY_NUMBER = 17.01;

    // Method signatures (end with semicolon, no body)
    // all methods implicitly public
    void doStuff(int i, double x);
    int doOtherStuff(String s);
}

Example Interface
Implementing an interface

• Use implements in class definition.
• A class can implement more than one interface. Separate interface names with comma.
• Class must implement all the methods declared in the interface.
public class MyImpl implements MyInterface {

    public void doStuff(int i, double x) {
        // I’m just going to do nothing, so there!
    }

    public int doOtherStuff(String s) {
        return s.length();
    }
}

Implementing multiple interfaces

```java
public interface Fruit {
    boolean hasPeel();
}

public interface Vegetable {
    boolean isRoot();
}

public class Tomato implements Fruit, Vegetable {
    public boolean hasPeel() {
        return true;
    }
    public boolean isRoot() {
        return false;
    }
}
```
public static void main(String[] args) {
    Tomato t1 = new Tomato();
    Fruit t2 = new Tomato();
    Vegetable t3 = new Tomato();

    boolean testPeel1 = t1.hasPeel();
    boolean testPeel2 = t2.hasPeel();

    // boolean badTestPeel3 = t3.hasPeel();
    boolean testPeel3 = ((Tomato)t3).hasPeel();
}

public interface Relatable {
    boolean isLargerThan(Relatable other);
}

public static Relatable findLargest(Relatable[] items) {
    Relatable largest = null;
    for (Relatable item : items) {
        if (largest == null || item.isLargerThan(largest)) {
            largest = item;
        }
    }
    return largest;
}
Interface as API

- Company makes interface public to customers.
- Implementation of interface kept secret.
- Implementation may change later. Fine as long as still implements original interface.
- Sometimes customer implements the company’s interface.
  - Java API
Review: Enum

• Fixed set of constants
• Can iterate over values
• Can use in a switch
• Use as a type
• Values are objects
public enum Day {
    SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, SATURDAY
}

public static void main(String[] args) {
    Day today = Day.FRIDAY;
    switch(today) {
    case SATURDAY:
    case SUNDAY:
    System.out.println("Yay! Weekend!");
    break;
    default:
    System.out.println("Not another weekday!");
    break;
    }
}