

## Section AA

July 10

## compareTo

- Often useful to have a method to order elements
- Every class has an equals() method, not every class has a compareTo()
  - Why not? What would it mean for a Rectangle?
- Introduce the Comparable interface
  - classes say that they implement compareTo() by implementing the Comparable interface
  - NOTE: the fact that this is an interface and not a class is important. We can implement as many interfaces as we want.

## Look at compareTo

```
//Returns int <0: if this < o
//Returns int ==0: if this equals o
//Returns int >0: if this > o
int compareTo(Object o);
```

But what if we say:

```
new Integer(4).compareTo("Hi there!!");
```

//Assume we are careful never to add null strings

```
Class HourlyEmployee extends Employee implements Comparable {
    private String lastName;
    private String firstName;
    public int compareTo(Object o) {
        int compareVal;
        if (o != null) {
            HourlyEmployee hEmp = (HourlyEmployee)o; // What if not the type?
            compareVal = lastName.compareTo(hEmp.lastName);
            if (0 != compareVal) {
                return compareVal;
            } else {
                return firstName.compareTo(hEmp.firstName());
            }
        } else {
            throw new NullPointerException();
        }
    }
}
```

## Exceptions

- Two major uses
  - Deal with programming errors
    - null pointer exceptions
    - illegal class casts
  - Deal with "unusual" occurrences that are otherwise inconvenient to signal
    - Disk is full
    - Unable to open a file or which the user may not want to check individually
    - No elements remaining in an iterator
- Side question
  - When should you use asserts?

## Exceptions

- When should you catch an Exception?
  - When you can recover from the problem
  - When you need to clean up something before fully failing
  - When you can throw a more standard error
- When shouldn't you?
  - When you have no idea what the exception means

## Packages

```
C:\
  myclasses
    interesting
      really
  yourclasses
    interesting
    mine
```

- Sample classpath:  
.;bin/db.jar;C:\myclasses;C:\yourclasses

## assert

- BlueJ/Doctor java have check boxes to enable assertions
- Eclipse has a compiler option to select 1.4 code versus 1.3
  - Might also need to change "run" commands to add the -ea flag

## Exception example

```
Exception in thread "main"
java.lang.IndexOutOfBoundsException: Index: 1, Size: 0
    at java.util.ArrayList.RangeCheck(ArrayList.java:508)
    at java.util.ArrayList.get(ArrayList.java:320)
    at T.anotherFunction(T.java:11)
    at T.callIt(T.java:16)
    at T.main(T.java:22)
```