ComSci 6
Programming Design and Analysis

February 5, 2008
Prof. Rodger

"Hello"

Announcements
• Read for next time Chap. 10.1-4, 11.1
• Assignment 5 is due Thursday
• Classwork Jan 29 due today
• Classwork Jan 31, Feb 5 due Friday
• Reading Quiz for next time
• Exam 1 is Thursday, Feb 14!

Review
• Types of loops
  – while
  – for
  – Collections for

• Group of data of the same type
  – Array
  – ArrayList – Collection in Java

Review - while

```java
public void printFencePost(int numberPosts) {
    String rail = "|||";
    String post = "I";

    int num = 1;
    System.out.print(post);
    while (num < numberPosts) {
        System.out.print(rail);
        System.out.print(post);
        num++;
    }
    System.out.println(" ");
}
```
**Review – Array/For loop Example**

- Find max number, assume at least one number in the array

```java
public double MaxInArray(double[] numbers) {
    double max = numbers[0];
    for (int k = 1; k < numbers.length; k++) {
        if (numbers[k] > max)
            max = numbers[k];
    }
    return max;
}
```

**How do you use an ArrayList?**

What does this code do?

```java
// create an ArrayList
ArrayList<Integer> numbers = new ArrayList<Integer>();
numbers.add(78);
numbers.add(83);
numbers.add(43);
numbers.set(0, 94);
Collections.sort(numbers);
System.out.println(numbers.size());
System.out.println(numbers.get(0));
```

**To use other Classes**

- Sometimes need to add an import

```java
import java.util.Collections;
import java.util.Arrays;
```

- Appears at top of program

```java
import java.util.Collections;
```

**Same Problem from before - Find Max - Use an ArrayList**

```java
public double MaxInArray(double[] numbers) {
    // convert to ArrayList first
    ArrayList<Double> numbersAL = new ArrayList<Double>();
    for (int k = 0; k < numbers.length; k++) {
        numbersAL.add(numbers[k]);
    }
    ```
Alternative (cont)

```java
// or Alternatively use for loop and get max
max = numbersAL.get(0);
for (int k=0; k< numbersAL.size(); k++)
{
    if (numbersAL.get(k)> max)
        max = numbersAL.get(k);
}
return max;
```

Strings (cont)

- How do you build a new string?
  - Initialize a string as empty
  - Use + (concatenation) to put strings together
  - Example:
    ```java
    String dayFairStarts = "";
    String month = "Oct";
    dayFairStarts = "Friday";
    dayFairStarts += "", " + month + " + 14 + ", " + 2005;
    ```
  - Has the string been modified?
What can you do with strings?

- Look at API
- int length()
  - Returns length of string
- String substring(int beginIndex)
  - Returns substring from beginIndex to end of string
- String substring(int beginIndex, int endIndex)
  - Returns substring from beginIndex to endIndex - 1

Example

```java
String one = "ferriswheel";
String two = one.substring(5);
String three = one.substring(4, 6);
```

What are two and three?

Finding substrings in strings

- int indexOf(String str)
  - Returns first position of str in the string
  - First position in a string is 0
- int indexOf(String str, int fromIndex)
  - Returns first position of str starting at fromIndex

Example

```java
String one = "Cotton Candy";
String two = one.substring(indexOf("Can"), indexOf("Can") + 4);
```

What is two?
Review Strings

- String word = “CompSci 6”;
- word.length() – returns length of string
- word.toCharArray() – returns string as an array of characters
- word.charAt(5) – returns character at position 5
- Loop over characters in a string
  for (char ch: word.toCharArray())
  {
  }

Write Reverse a String, Palindrome

- String Reverse(String s)
  – Returns the string in reverse
  – Hint: Build a new string that is the reverse
- Boolean Palindrome(String s)
  – Returns true if s is a palindrome
  – Hint: Use Reverse

Classwork Birthday

- Convert a String that represents a number to an int
  Example (hint):
  String numString = “87”;
  int num =
  Integer.parseInt(numString);
  // num has int value 87