CSE 142 Iterating Through Collections

Introduction

- · Quick Review
 - · ArrayList collections; add, size, get methods
 - · Iteration and while loops
- Today
 - · Iterating through collections
- · Iterator objects
- Reading
- · Dugan notes: ch. 17
- Niño & Hosch: sec. 12.3-12.4 (The iterators here are slightly different, but the basic ideas are the same)

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Using Collections

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· We can create ArrayLists, and put things into them.

ArrayList names = new ArrayList(); names.add("Bob"); names.add("Sue"); names.add("Jeremiah");

- We can pick out elements at particular index positions. String someNames = names.get(0) + " and " + names.get(1);
- · But how can we do something for all names?
- · Print out all names in the list.
- · Find the first name, alphabetically.
- · Find what the longest name.
- See if a given name is in the list.

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N-3

Iterating Through Collections

· What we really want is to be able to write:

For all elements in the list,

- This will be a loop, since we want to repeat the "do something" for each element in the list.
- To get "all elements in the list", we can use an *iterator* object.
 - · Ask the array list for its iterator object.
 - Ask the iterator object for each element, in turn, as part of a while loop.
- We don't have to know how many elements are in the list!

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N-4

Iterator Operations

 Getting an iterator object from an ArrayList (and many other kinds of Java collections):

Iterator iter = names.iterator();

· Here are the methods provided by Iterator:

// Return true if the iteration has more elements. public boolean has Next():

// Return the next element in the iteration. public Object next();

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Using an Iterator, in English

· General algorithm:

Get the iterator for the collection [names.iterator()].

While the iterator has at least one more element [iter.hasNext()],

Get the next element [iter.next()].

Do something using the element.

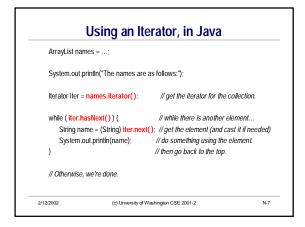
Then go back to the top. Otherwise, we're done.

· What's the flow chart?

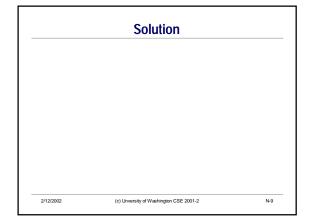
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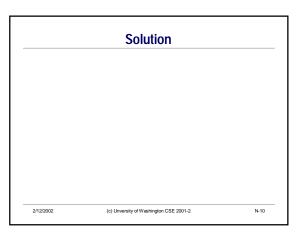
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Another Example: Finding the Longest Name • Suppose we want to find the longest name. How would we do it? • Recall: "Bob".length() == 3 • What's the algorithm in English? • What's the flow chart? • What's the Java code?





CSE142 Wi02 N-2