Last Time

• Multi-dimensional arrays
  – “Array of arrays”
  – Iterating across rows and columns with .length
  – No limit on the number of dimensions
  – Calculating min/max/avg
Linked Lists

• An alternative to the array structure.
  – A sequence of nodes that form a linear sequence.

• Each node contains:
  – The data item
  – A reference to the next data item
Traversing Lists

• Singly-linked list

• Doubly-linked list

• Circular list
Adding and Removing Items

NewNode

12
node

99
node.next

12
node

99
node.next

NewNode

37

12
node

99
node.next

37
node.next.next

12
node

99
node.next

37
node.next.next

09/18/2015

Linked Lists
Using Linked Lists

```java
LinkedList myList = new LinkedList();
myList.add(15);
myList.add(23);
myList.add(-4);
System.out.println(myList.get(1));
```
Using Iterators

Iterator iter = myList.iterator();
while (iter.hasNext()) {
    System.out.println(iter.next());
} //while
Generics

LinkedList<Double> myList2 = new LinkedList<Double>();

myList2.add(234234.432432);
myList2.add("this breaks the program");
Why Bother?

• Let’s say we declare an array a[100] for our data, but only have 5 things to store.
  – Lots of wasted space.

• Let’s say we declare an array a[100] for our data, but it turns out we need space for 101 thing.
  – Java has to delete the old array and create a new one of size 101 – wasted computation time

• On systems with limited memory, allocating a consecutive block of size 100 could be impossible.
Any Questions?