Agenda

• Announcements
• Projects
• Max Heaps and Arrays
• Questions
Announcements

- Projects
- Binary Search Tree project due Friday at 11:00 PM
- Questions?
Max-Heap Implementation

- Write a class called MaxHeap that wraps ArrayList
- Implement isEmpty(), add(), and removeLargest()
- Implement printSortedList()
- Implement JUnit tests
Heaps as Arrays

- Recall that heaps can be stored as arrays
- *i*th node access:
  - children $a[2i+1]$ and $a[2i+2]$
  - parent $a[floor((i-1)/2)]$
Heap Size Check

- Arrays make the isEmpty() check very easy
Adding to Array-based Heaps

- **General Idea:**
  - Add element to end of list and swap with its parent until the heap property is preserved

Tuesday, November 1, 2011
Removing Max from Array-based Heaps

- General Idea:
  - Remove the head, replace it with the last element, and bubble it down until the max-heap property is conserved
Printing Heaps

• General Idea:
  • Take a collection, and insert all the elements into a max heap
  • Remove the maximum element, print it, and re-heapify
  • Repeat the above step until the heap is empty