Test 2 will be Thursday, April 7 in class. It will be closed-book and notes, except for one 8.5” x 11” sheet of paper containing any notes that you want. (Yes, you can use both the front and back of this piece of paper.) The test will cover Chapters 15-17 and sections 18.9 - 18.11 on Heaps and their usage to implement priority queues. The following topics (and maybe more) with be covered:

**Chapter 15. Linear Collections: Queues**
General concept of a queue: FIFO, front and rear
Queue Operations: enqueue, dequeue, peek, len, isEmpty, str
Queue Implementations: LinkedQueue and ArrayQueue (circular, array implementation) including complexity of operations
Queue Applications: Simulations, round-robin scheduling

Priority queue implementations: Comparable class, LinkedPriorityQueue implementation

**Sections: 18.9 - 18.11 on Heaps their usage to implement priority queues**
General concept of a storing a complete-binary tree in an array
Implementing a heap: heap-order property
Using a heap to implement a priority queue: HeapPriorityQueue class
Using a heap to perform sorting and its complexity analysis

**Chapter 16: Lists**
Terminology: head, tail, index
Types of Operations and interfaces: Index-based, content-based, position-based
Applications of lists (the general idea only): heap-storage management, organization of files on disk
Indexed-list implementations and analysis: Array-based and singly-linked structure
Positional-list implementations and analysis: Array-based and doubly-linked structure
Iterators and Python implementation
Case Study: Sorted List implementation using an ArrayIndexedList

**Chapter 17: Recursion** (mostly sections: 17.1 and 17.3)
Divide-and-Conquer technique of solving a problem
Recursive sorts analysis and implementation: quick sort and merge sort
Recursive backtracking: Coin-change problem and maze example