CS 367 - Introduction to Data Structures
Tuesday, July 14, 2015, Lecture 17

Course website: http://pages.cs.wisc.edu/~cstapleton/367/
Piazza: https://piazza.com/wisc/summer2015/cs367/

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Last Time
- Last week review
- Trees (cont’d)
- Binary Trees

Today
- Program 2 due tonight
- HM5 Assigned
- Tree Traversals
- Priority Queues
- Comparable<E> interface
- Heaps

Next Time
- Heaps (finish)
- Binary Search Trees
Tree traversals

Goal: Visit every node in the tree exactly once

Level-order

Pre-order

Post-order

In-order
Traversals: Practice
Priority Queues

Concept:

“For NASA, space is still a high priority.”

– Dan Quayle

Applications:

Operations:
Comparable<E> Interface

Only one method:

    public int compareTo(E other) { ... }

What should it return?

Example:

    public class Employee implements Comparable<Employee> {
        private String name;
        private int ID;
        ...

        public int compareTo(Employee other) {
            int otherID = other.ID;
            if (id == otherID) return 0;
            if (id > otherID) return 1;
            return -1;
        }
        ...
    }
Heaps

Concept:

Implementing heaps (with example):

   Using Binary Trees:

      Using arrays:
Inserting into a heap

Strategy:

Example:
Inserting into a heap (cont'd)

Heap class data members:

    private Comparable[] items;
    private int nextLoc;

Pseudo-code:

    public void insert(Comparable newItem) {