

CS367 Lecture 17

Tuesday 15 July 2014

Announcements/Reminders:

- P2 due today
- HW5 assigned

Last class:

- Midterm solutions
- Trees (cont'd)
- Binary Trees
 - Types

Today:

- Tree traversals
- Priority Queues
- Comparable<E> interface
- Heaps

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) {
```