Last Lecture

- Queue
Learning Outcomes

At the end of this lecture, students will be able to:

- Describe Priority Queue
- Define public interface of Priority Queue ADT
- Design and implement Priority Queue ADT using various data structures
- Compare and contrast these various implementations using Big O notation
- Give examples of real-life applications (problems) where we could use Priority Queue ADTs to solve the problem
- Solve problems using Priority Queue ADT
Today’s Menu

- Introducing a position- and value-oriented data collection
  - Priority Queue
Priority Queue

- Elements in a priority queue are given a priority value
  - Which could be numerical or something else
- Dequeue: Removes the highest priority element
- Uses include
  - ER triage system
Step 2 – Design – Priority Queue Operations

- **isNotEmpty**: Is the priority queue empty?
- **enqueue**: Insert element into the priority queue
- **dequeue**: Remove element with highest priority from the priority queue
- **peek**: Retrieve element with highest priority from the priority queue (but does not remove the element)
- **dequeueAll**: Remove all element from queue
Issues related to Priority Queue

- How to efficiently implement its operations
  - For array-based and link-based implementations
    - If enqueue is $O(1)$, then dequeue is $O(n)$ and vice versa 😞

- Will revisit Priority Queue later on this semester
Summary

- Introduced a position- and value-oriented data collection
  - Priority Queue
Next Lecture

- Moving on to hierarchical data collection!!!