Recurring Section 10

Aniruth – 5 PM

Announcements

- This week covers a variety of algorithms and sorts.
  - These are all pretty complex and very important, so I would highly recommend you pay very close attention.
  - I anticipate we will talk about the algorithms next time.
- We're almost there! Keep yourself going, because we are really close to the finish line.
  - We have some review stuff planned for next week to help you all before the final!

Content Review

Heaps

- This is basically a binary tree, with a few modifications:
- The tree is complete. Nodes are as high and as left as possible
- The tree satisfies either the min or max heap property
  - Nodes are either smaller or larger than all nodes below it, respectively
- The point is that accesing the minimum will always take constant time because it's just the root
- To ensure completeness, when adding a new item or removing the minimum, think of the bottom rightmost item
  - For adding, we add here and then bubble up the item as needed
  - For removing the minimum, we remove it, then replace with the bottom rightmost item, then bubble this item down as needed

Heaps/Graphs

- Heaps can be represented as arrays. The first item (index 0) may or may not be used based on keeping the math simple, but it allows easy access to left/right children and parents.
  - It's also level order!
- Graphs are a representation of nodes and their connections to each other.
- These may be directed or undirected.
- There are a lot of ways to represent these, including adjacency lists and matrices.
- These are going to be very important as we delve into more specifics with the algorithms later on.