Recurring Section 12

Aniruth – 5 PM

Announcements

- Last recurring tutoring section!!
- Final sprint – there's a final this Thursday, we have review sessions today and tomorrow, so take Thursday easy.
- Same tips from Midterm 2 apply – make sure you have a good cheat sheet, you've looked at old exam problems, and relax!

Content Review

Sorting

- Two main classifications of sorts in this class:
  - Comparison Sorts
    - Insertion, Selection, Heap, Merge, Quick
  - Counting-Based Sorts
    - Radix (MSD, LSD)
      - Uses counting sort as the subroutine, other sorts may be used
- Comparison sorts are lower bounded by NlogN, radix sorts could theoretically run in linear time given a few conditions (dependent on width, alphabet, etc.)

Insertion Sort

- Sort the mini array and expand outwards to the right.
- For each new item, swap backwards until the new mini array is sorted.
- Repeat.

Selection Sort

- Idea is to find the smallest item, swap it to the front, and repeat on the n-1 remaining items.

Heap Sort

- Idea is to do bottom up heapification using bubbling down, then keep deleting the largest item and putting it in n times at the end.

Merge Sort

- Keep splitting the array into two, then merge them back upwards.
- The merge process is a little tricky and takes linear time; the number of merges is logarithmic.

Quick Sort

- Idea is to choose a pivot, partition into a smaller array, a greater array, rearrange, and then repeat on the subarrays.

MSD and LSD Radix Sort

- Sort the characters, not the whole thing at once using a comparator.
- LSD best and worst case is the same – always have to go through the full item.
- MSD best case means just one digit needs to be compared.