Midterm Topics 100 pt exam

Review Hws & practice problems.
Bring one 8½×11 crib sheet

Divide-and-Conquer Algorithms

15-20 Should be able to design with good hints
use Should be able to analyze (master method)
You should be able to go from alg to recurrence

\[ T(n) = aT(n/b) + f(n) \]

and then solve with master method
Asymptotic Notation

Understand and be able to compare asymptotic growth rate of functions.

\[ l_1 \leq l_2 \]

\[ n^{l_1} (\log n)^{k_1} \text{ vs } n^{l_2} (\log n)^{k_2} \]

If \( l_1 > l_2 \), left grows faster.

If \( l_1 = l_2 \), based on \( k_1 \) vs \( k_2 \).
Make design decisions between types of positional collections.

Set ADT (Mapping ADT)

Bucket Mapping ADT

tag → {elements}

Priority Queue ADT

Ordered Collection ADT

Digitized Ordered Collection ADT

Spatial Collection ADT
Sorting Algs
  insertion sort
  merge sort
  quicksort (randomized or median of three partitioning)
  radix sort

When each is best
Adversary lower bound

Technique

Set ADT (basic level) of imp.

Direct Addressing
Open Addressing
Separate Chaining