Midterm Topics

100 pt exam

Review Hws & practice problems.

Bring one 8½ x 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

\[ T(n) = aT\left(\frac{n}{b}\right) + f(n) \]

and then solve with master method
Asymptotic Notation

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

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

If \( l_1 > l_2 \) left grow 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,
  \[ \text{element} \rightarrow \text{tag} \rightarrow \text{element} \]

Bucket Mapping ADT
  \[ \text{tag} \rightarrow \{\text{elements}\} \]

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
15-20 Adversary lower bound

Technique

Set ADT (basic level) of imp.

10-15 Direct Addressing
   Open Addressing

85-120 Separate Chaining