CSE417: Midterm Review

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Slides by Beame, Ruzzo, and others

Complexity

- Asymptotic Analysis
- Best/worst/average cases
- Upper/Lower Bounds
- Big O, Theta, Omega
- Analysis methods
  - loops
  - recurrence relations
  - common data structures, subroutines

Design Paradigms

- Greedy
- Dynamic Programming
  - recursive solution, redundant subproblems, few,
  - do all in careful order and tabulate
- Divide & Conquer
  - superlinear work
  - balanced subproblems

Examples

- Dynamic programming
  - Fibonacci
  - List partition
  - Longest increasing subsequence
  - Edit distance
  - HW: making change, etc.
- D & C
  - Merge sort
  - Polynomial multiply (Karatsuba)
  - Matrix multiply(Strassen)
  - Closest pair