Topics

Second midterm focuses on material between 9/14 and 10/14

Topics to be covered:

- Dynamic Programming Algorithms
- Greedy Algorithms
- Abstract Data Types
- Stacks and Queues
- Greedy Algorithms
- Priority Queues and Heaps
- Binary Search Trees and later topics WILL NOT be covered

Topics (I)

You should be able to:	Examples we've covered
State important definitions and properties	For example • What is the definition of a heap? • What is its minimum and maximum height?
Prove correctness of an algorithm using induction or loop invariants	
Apply algorithms learned in class to examples	For example • Do an insertion/deletion into a heap
Apply ideas from class to new, related, problems	For example • Homework 6 (d-ary heaps)

Topics (II)

You should be able to:	Examples we've covered

Solve a problem using dynamic programming strategy
• Come up with a brute force solution
• Come up with a DP recursive formula
• Write pseudocode for bottom-up or memoized solution
• Analyze running time of the solution
	Examples from lecture:
	• Weighted Interval Scheduling
	• Weighted Independent Set
	  • on a line (HW4.1)
	  • on a 2 x n grid
	• Longest Common Subsequence
	Exercises:
	• Minimarts (HW4.2)

Solve a problem using greedy strategy • prove that a given greedy strategy will not always yield an optimal solution using a counter-example • come up with a greedy strategy • write pseudo-code for the greedy algorithm • analyze running time of your algorithm • prove that the greedy strategy is optimal	Examples from lecture: • Unweighted Interval Scheduling • Interval Partitioning Problem • Scheduling to Minimize Lateness Exercises: • HW 5.1 (schedule last activity to start) • HW 5.2 (interval sub-cover)