

CSci 421  
Introduction to Algorithms

Midterm Study Guide

Midterm: Friday, Feb 11, 2000

Winter 2000

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Handout 5

February 9, 2000

- Growth rates of functions:  $o$ ,  $O$ ,  $\Omega$  and  $\Theta$  notation; definitions, limit test.
- Induction and examples of designing algorithms by induction: Horner's rule, maximal induced subgraph, 1-1 mappings, skyline, max consecutive subsequence.
- Dynamic Programming. Postage stamps/making change. Minimum edit distance/string alignment. 0 – 1 knapsack.
- Examples where greedy algorithms may fail: 0 – 1 knapsack problem, stamps/making change.
- Greedy algorithms for fractional knapsack problem, and optimal prefix codes (Huffman codes).
- Graph definitions: directed-, undirected-, weighted-graph; path, simple path, cycle, simple cycle, connected graph, tree, spanning tree.
- Graph Algorithms. Minimum spanning trees. Single source shortest paths; Dijkstra algorithm.