CSci 421

Introduction to Algorithms

Midterm Study Guide

**Midterm: Tuesday, July 20, 2004**

- Reading: in addition to reading assignments listed on homework sheets, also read 7.6.
- 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, sky-line, max consecutive subsequence, max increasing subsequence.
- Dynamic Programming. Postage stamps/making change. Matrix chain products. Minimum edit distance/string alignment. 0-1 knapsack.
- Examples where greedy algorithms may fail: 0-1 knapsack problem, stamps/making change, matrix chain products...
- Greedy algorithms for fractional knapsack problem, minimum spanning tree, and optimal prefix codes (Huffman codes).
- Graph definitions: directed-, undirected-, weighted-graph; path, simple path, cycle, simple cycle, connected graph, tree, spanning tree, cut.