Review for Final Exam

The exam will be closed notes, closed book, and no calculators. Exam may include true/false, multiple choice, short answer, and short proofs. When doing proofs, you must explain all of your steps.

Suggestion: carefully review lab problems and class notes. Reread relevant sections in text.

This exam will include problems from the previous two exams so please study these.

New Material

1. Greedy Algorithms

    - What is a greedy algorithm?
    - Why use non-optimal greedy algorithms?
    - What is the greedy choice property and how do you prove that a problem satisfies it?
    - What is the optimal substructure and how do you argue that a problem satisfies it?
    - Applications: cheapest path, hill climbing, activity selection, Huffman codes, fractional knapsack problem

2. Graphs

    - Definitions
    - Data structures for storing graphs: edge lists, adjacency lists, adjacency matrices.
    - Breadth First Search Trees
    - Depth First Search Trees
    - Topological Sorting
    - These were touched on very briefly:
        - Articulation Points and Bi-connected Graphs
        - Minimum Spanning Trees: Prim's Algorithm, Kruskal's Algorithm
        - Single Source Shortest Path - Dijkstra's Algorithm

    You should know how the algorithms work but you do not need to know specifics of how they are implemented in code.