Spring 2024 COP 3502H Sec 203 Exam #2 Review
Test Date/Time: March 20 (W) 1:20-2:55 pm HEC-110

I. Recursion
a. base case
b. standard problems: fib, fact, power, tipchart
c. Towers of Hanoi
d. Binary Search
e. Fast Modular Exponentiation
f. Floodfill
g. Permutation
h. Combination
i. Derangements
j. Backtracking – Eight Queens
l. Min-Max Trees

II. Linked Lists
a. iterating through an existing list
b. inserting (front, in order, back)
c. deletion
d. use of recursion

III. Stacks and Queues
a. Stacks - Array Implementation, Run Times
b. Stacks - Linked List Implementation, Run Times
c. Queues - Array Implementation, Run Times
d. Queues - Linked List Implementation, Run Times
e. Evaluating Postfix Expressions with an operand stack
f. Converting Infix Expressions to Postfix with an operator stack
g. Use of a Queue in a Breadth First Search

IV. Binary Search Trees
        a. Traversals
        b. Use of Recursion
        c. Searching for an item
        d. Insertion
        e. Deletion
        f. Finding the height of a node
        g. Finding the number of items in a binary tree
        h. Finding the sum of items in a binary tree
        i. Other functions - counting leaf nodes, etc.

V. AVL Trees
        a. AVL Tree Property
        b. Insertion
        c. Deletion
        d. Tracing Only

VI. Tries
        a. Insertion
        b. Going through nodes
        c. Recursively solving queries (how many words, length of longest word, etc.)

Format: Mostly coding, some tracing, no multiple choice or T/F.

How to Study:

1) Look over the notes.
2) Look over example code.
3) Look over your code.
4) Look for general patterns.

Don't try to just memorize each algorithm, though you should remember the steps in each algorithm. Instead, try to understand the underlying reason the algorithm works so that you can apply those ideas to problems that may call for slightly different algorithms.

Types of Questions:

Short Answer: Write a single line of code to complete some task.

Function Tracing: Give the output of some program or segment of code.

Code Writing: Write a function or complete a segment of code to solve some problem.

Exam Aids: NO EXAM AIDS