

# **Final Exam Review Outline**

## **I. Backtracking**

## **II. Use of Java Data Structures, Java Features**

- a. ArrayList, LinkedList, ArrayDeque**
- b. TreeSet, TreeMap**
- c. HashSet, HashMap**
- d. PriorityQueue**
- e. Custom Sorting**

## **III. Data Structures**

- a. Disjoint Sets**
- b. 2-4 Trees**
- c. Red-Black Trees**
- d. Skip Lists**

## **IV. Sorting**

- a. Quick Sort Average Case Analysis**
- b. Lower Bound for Adjacent Element Swap Sorts**
- c. Lower Bound for Comparison Sorts**
- d. Bucket Sort**
- e. Radix Sort**

## **V. Graphs**

- a. Definition & Different Types**
- b. Depth First Search**
- c. Breadth First Search**
- d. Topological Sort**
- e. Network Flow**

## **VI. Greedy Algorithms**

- a. Fractional Knapsack**
- b. Single Room Scheduling**
- c. Multiple Room Scheduling**
- d. Change**
- e. Kruskal's**
- f. Prim's**
- g. Dijkstra's**
- h. Huffman Coding**

## **VII. Divide and Conquer**

- a. Integer Multiplication**
- b. LCS**

## **VIII. Dynamic Programming**

- a. Change Problem**
- b. Floyd-Warshall's Algorithm and path reconstruction**
- c. Longest Common Subsequence**
- d. 0-1 Knapsack Problem**
- e. Matrix Chain Multiplication**