

CSE 102

Introduction to Analysis of Algorithms

Outline of Topics

- I. Mathematical Preliminaries
 - Asymptotic Growth Rates (Handout, CLRS 3.1)
 - Common Functions (Handout, CLRS 3.2)
 - Induction Proofs (Handout)
 - Recurrence Relations (Handout, CLRS 4.1-4.6)

- II. Divide and Conquer Algorithms
 - Searching, Sorting (CLRS 7)
 - Selection (CLRS 9)
 - Non-Comparison sorts (CLRS 8)
 - Strassen's Algorithm (CLRS 4.2)

- III. Dynamic Programming (CLRS 15)
 - Coin Changing Problem
 - Discrete Knapsack Problem
 - Matrix Chain Multiplication (CLRS 15.2)
 - All-Pairs Shortest Paths Problem (CLRS 25)

- IV. Greedy Algorithms (CLRS 16)
 - Continuous Knapsack Problem
 - Minimum Weight Spanning Trees (CLRS 23)
 - Matroids (CLRS 16.4-16.5)

- V. Lower Bounds and Computational Complexity
 - Decision Trees (CLRS 8.1)
 - Adversary Arguments (Handout)

- VI. Ammortized Analysis
 - Fibonacci Heaps (CLRS 19)
 - Disjoint Sets (CLRS 21)