

Sorting and Divide-and-Conquer

- Heapsort
- Linear time sorting algorithms
 - Counting-sort
 - Radix-sort
- Mergesort
- Quicksort
- Strassen's algorithm for Matrix Multiplication
- Finding closest pair
- Counting Inversions (Test)
- Counting Significant Inversions (A2)

Greedy Algorithms

- Proof of correctness
- Activity Scheduling Problem
- Generic algorithm for MST (and correctness)
- Kruskal's and Prim's algorithms for MST (and showing that they implement GenericMST)
- Making Change (Assignment)

Dynamic Programming

- 4 steps in designing a Dynamic-programming algorithms
- Longest Common Subsequence
- Assembly Line Scheduling (and variant)
- Matrix-Chain Multiplication
- Subset Sum
- Knapsack
- Scheduling Jobs with Deadlines, Durations and Profits
- Computing Edit Distance (A3)
- Longest st -path in Ordered Graph (A3)

Breadth-First Search

- The algorithm
- Breadth-first tree
- Compute shortest distances to s
- Bipartite Matching (2-COLOR) and variant.
- Compute number of shortest st -path (A3)

Depth-First Search

- The algorithm
- Depth-first forest
- Topological sorting

Network Flow

- 4 steps in solving a problem using Network Flow
- Residual network
- Max-Flow Min-Cut Theorem
- Ford-Fulkerson algorithm and properties
- Edmons-Karp algorithm
- Bipartite Matching
- Number of edge-disjoint st -path