Aj's guide for algorithms and data structures

Massive 90+ tutorials for beginners to advanced. This will help you in competitive problem solving and also in programming interviews. All the solutions are provided in C or C++. You can welcome to post the solutions in other languages.

This is the result for my past 6 months of hard work and sleepless nights that I have put into. I am now creating phase-2, which inludes even more complex algorithms. I shall complete them in coming months.

Chapter 1: Introduction to algorithm and their types

Chapter 2: Performance analysis of an algorithm: Space Complexity

Chapter 3: Performance analysis of an algorithm: Time Complexity

Chapter 4: Asymptotic Notations

Chapter 5: Asymptotic Notation Big O <take example of all the notations involved and solve them>

Chapter 6: Asymptotic Notation Big Omega and Theta

Sorting Algorithm 1: Bubble sort

Sorting Algorithm 2: Selection Sort

Sorting Algorithm 3: Insertion Sort

Sorting Algorithm 4: Merge Sort

Sorting Algorithm 5: Quick Sort

Sorting Algorithm 6: Pigeonhole Sort

Sorting Algorithm 7: 3-Way Quicksort (Dutch National Flag) algorithm

Sorting Algorithm 8: Cocktail Sort

Sorting Algorithm 9: Radix Sort

Sorting Algorithm 10: Bucket Sort

Sorting Algorithm 11: Counting Sort

Sorting Algorithm 12: Shell Sort

Sorting Algorithm 13: Topological sort

Sorting Algorithm 14: Heap sort

Searching Algorithm 1: Linear Search

Searching Algorithm 2: Binary Search

Searching Algorithm 3: Jump Search

Searching Algorithm 4: Interpolation Search

Searching Algorithm 5: Exponentail Search

Searching Algorithm 6: Ternary Search

Data structure tutorial 1: Stack Data structure and Implementation using arrays.

Data structure tutorial 2: Stack Data structure and Implementation using Linked List.

Data structure tutorial 3: Singly Linked List with Implementation.

Data structure tutorial 4: Doubly Linked List [DLL] with implementation .

Data structure tutorial 5: Circular Singly Linked List with implementation.

Data structure tutorial 6: Circular Doubly Linked List with Implementation.

Data structure tutorial 7: Queue Data Structure with implementation using arrays.

Data structure tutorial 8: Queue Data Structure with implementation using linked list.

Data structure tutorial 9: Circular Queues Data structure with Implementation using arrays.

Data structure tutorial 10: Circular Queue Data structure with Implementation using Linked List.

Trees

Tree data structure tutorial 1. Tree DataStructure Introduction

Tree data structure tutorial 2. Introduction to Binary Tree

Tree data structure tutorial 3. Binary Tree Traversal

Tree data structure tutorial 4. Binary Search Tree Introduction

Tree data structure tutorial 5. Implementation of BST

Tree data structure tutorial 6. Implementation of Binary tree

Tree data structure tutorial 7. TRIE Data structure

Tree data structure tutorial 8. Heaps

Tree data structure tutorial 9. Priority Queue

Tree data structure tutorial 10. AVL tree

Tree data structure tutorial 11. segment trees

Tree data structure tutorial 12. Implementation of segment trees

Tree data structure tutorial 13. Lazy propagation of segment trees

Tree data structure tutorial 14. Implementation of Lazy propagation of segment trees

Tree data structure tutorial 15. Fenwick trees

Tree data structure tutorial 16. Implementation of fenwick trees

Graph:

Graph data structure tutorial 1. Graph Introduction

Graph data structure tutorial 2. Graph Representation Adjacency Matrix

Graph data structure tutorial 3. Graph Representation Adjacency List

Graph data structure tutorial 4. Graph Traversal

Graph data structure tutorial 5. Graph Traversal using Stack and Queue

Graph data structure tutorial 6. Code for Graph Traversal

Graph data structure tutorial 7. Bipartite graph

Graph data structure tutorial 8. Graph colouring problem

Graph data structure tutorial 9. Check if the graph is Bipartite graph or not using graph colouring

Graph data structure tutorial 10. Isomorphic Graph

Graph data structure tutorial 11. Euler Graph

Graph data structure tutorial 12. Hamiltonian Graph

Different types of problem solving technique

1. Brute force approach

2. Recursion

3. Dynamic programming approach

4. Backtracking approach

5. Ball in a maze problem solution using backtracking

5. Greedy approach approach

6. Two pointer approach

Minimum Spanning Tree:

Mnimum Spanning Tree tutorial 1. Introduction to minimum spanning tree

Mnimum Spanning Tree tutorial 2. Kruskals algorithm

Mnimum Spanning Tree tutorial 3. Prims Algorithm

Shortest Path algorithms:

Finding shortest path algorithm tutorial 1. Bellman ford

Finding shortest path algorithm tutorial 2. Dijkstras

Finding shortest path algorithm tutorial 3. Floyd warshalls

String matching algorithms

String matching algorithms tutorial 1. Knuth Morris Pratt String matching algorithm

String matching algorithms tutorial 2. Rabin Karp algorithm

String matching algorithms tutorial 3. Boyer–Moore string-search algorithm

Knapsack Problem:

1. Fractional knapsack

2. Knapsack

Additional Algorithms:

1. P, NP, NP hard, NP Complete

2. Tower of hanoi

3. Sieve of Eratosthenes

4. Kadane Algorithm

5. Sliding Window Approach

6. Travelling Salesman problem

7. Coin Change Problem

8. Coin Change Problem - Total Number of denomination available.

9. Job Sequencing problem

10. Activity Selection Problem

11. House Robber Problem

12. Egg dropping problem