CypherCreed's

Learning Path

Data Structures & Algorithms

Contributors:

Deval Sethi
(Founder)
LinkedIn
devaljain1998@gmail.com

Ujjwal Singh Bhadoria
(Founder)
LinkedIn
ujjwalsinghgravity@gmail.com

Arghya Debnath
(Core-Team)
LinkedIn
arghya.debnath97@gmail.com

Shishir Maurya
(Core-Team)
LinkedIn
shishir101098@gmail.com

Table Of Contents:

Introduction:

- **What is Data Structures and Algorithms?**
- **Why DSA?**
- **Career benefits**

Learning Path

1. **Pre-Requisites**:
    - If you are using C/C++ language to learn DSA->
        - Data Types
        - Arrays
        - Call by reference
        - Dynamic memory Allocation
        - Structures
    - If you are using Java language to learn DSA->
        - Good knowledge of OOPs concept

2. For C language users, Start with DSA playlist on mycodeschool channel.
3. For JAVA language users, Start with this Tim Buchalka's course on DSA.
4. Begin with->
    - Algorithms
        - What is an algorithm?
        - Algo. analysis
        - Big O notation
    - Data Structures
        - Linked List
        - Types of Linked List
        - Stack
        - Queue
        - Circular Queue

- Trees
    - Tree
    - Binary Search Tree
    - AVL tree
    - Red Black tree
    - B tree
- Graphs
    - Graph Representation
- Sorting
    - Insertion Sort
    - Selection Sort
    - Bubble Sort
    - Heap Sort
    - Merge Sort
    - QuickSort
- Hashing
    - Hash Table
    - You will find a document on Hashing in this folder
- Heap
    - Heap
    - Priority Queues
- Top Algorithms
    - Divide and Conquer
    - Bellman-Ford Algorithm
    - Floyd_Warashall Algorithm
    - Dijkstra's Algorithm
    - Prim's Algorithm
    - Kruskal's Algorithm
    - Lee Algorithm - Shortest path in a Maze
    - Kadane's Algorithm
    - Backtracking
    - Greedy Algorithm
        - String Algorithms->
            1. Aho Corasick
            2. Z- Algorithm

- Mathematics
    - KhanAcademy Mathematics
    - Number Theory
    - Notes and question of Number Theory
    - Practise questions of mathematics on Project Euler

Other Resources:

Books:

➔ Top Book for Data Structures & Algorithm:

- Data Structures & Algorithms- Narasimha Karumanchi

➔ Top Books for Algorithms:

- The Algorithm Design Manual
- The Pragmatic Programmer