Complete DSA in Python

A comprehensive chase to excel any intreview for the Data Structures and Algorithms. This course has been specifically designed to provide resources that would assist you in cracking problem-solving interviews. The presented problems in the course would suffice to look on to positive outcomes in the interviews.

Duration : 3 Months Language : english Price : 25000

What you will learn?

- Introduction to Algorithms
- Analysis in Algorithms
- Array Data Structure
- Heap Data Structure
- Recursion
- Divide and Conquer
- Linked List Data Structure
- Stack and Queue
- Hashing Data Structure
- Tree Data Structure
- Binary Search Tree
- Graph Traversal Algorithms
- Application of greedy algorithm
- Dynamic Programming
- Research Area- P, NP, NP-Hard and NP-Complete Problems

Features

- Course Materials
- Self Paced Learning
- Lifetime Dashboard Access
- Completion Certificate

Requirements

- System with minimum i3 processor or better
- At least 4 GB of RAM
- Working internet connection
- Dedication to learn

Course Curriculum

Introduction to Algorithms

- Complete DSA Roadmap
- Why DSA required
- Algorithms Introduction
- Steps to construct an algo

Analysis in Algorithms

- Types of Analysis
- Asymptotic Notation - Big O Time Complexity
- Asymptotic Notation - Omega Time Complexity
- Asymptotic Notation - Theta Time Complexity
- Apriori Analysis - Time Complexity Analysis Part1
- Apriori Analysis - Time Complexity Analysis Part2
- Apriori Analysis - Time Complexity Analysis Part3
- Practice Set - Asymptotic Notations
- Complexity Classes
- Recurrence Relation Introduction
- Substitution Method - Problem 1
- Substitution Method - Problem 2
- Substitution Method - Problem 3
- Recursive Tree Approach - Problem 1
- Recursive Tree Approach - Problem 2
- Recursive Tree Approach - Problem 3
- Practice Set - Substitution and Recursive Tree Approach
- Masters Theorem Case 1
- Masters Theorem Case 2
- Masters Theorem Case 3
- Practice Set - Masters Theorem

Array Data Structure

- Introduction to Array Data Structure
- Array Data Structure Implementation
- Address of an element in 1D array

- Address of an element in 2D array
- Searching of an element - Linear Search
- Searching of an element - Binary Search
- Recurrence Relation of Binary Search
- Implementation of Binary Search
- Binary Search Interview Problem
- Search a 2D Matrix
- Searching of an element - Ternary Search
- Recurrence Relation of Ternary Search
- Implementation of Ternary Search
- Sorting in an array - Comparison and Non-Comparison
- Stable and Unstable sorting algorithms
- Inplace and Outplace Sorting algorithms
- Comparison Sort - Bubble Sort
- Comparison Sort - Bubble Sort Implementation
- Comparison Sort - Selection Sort
- Comparison Sort - Selection Sort Implementation
- Comparison Sort - Insertion Sort
- Comparison Sort - Insertion Sort Implementation
- FAANG Interview Question on Arrays - Best Time to Buy and Sell Stock
- FAANG Interview Question on Arrays - Collinear Points
- FAANG Interview Question on Arrays - Majority Element
- FAANG Interview Question on Arrays - Sort Colors

Heap Data Structure

- Basics of Heap Sort - Full Binary Tree vs Complete Binary Tree vs Almost Complete Binary Tree
- Concept of Minheap and Maxheap Tree
- Insertion in Minheap or Maxheap Tree
- Deletion in Minheap or Maxheap Tree
- Creation of Minheap or Maxheap Tree
- Time Complexity Derivation to build minheap or maxheap
- Comparison Sort - Heap Sort
- FAANG Interview Question on Heap - Top K frequent elements
- FAANG Interview Question on Heap - K Closest Points to Origin

Recursion

- Introduction to Recursion
- Factorial Finding using Recursion with its Implementation
- Fibonacci Series using Recursion with its Implementation
- Count Of number of ways to reach upstairs

Divide and Conquer

- Introduction to Divide and Conquer
- Applications of Divide and Conquer - Finding of maxima and minima
- Applications of Divide and Conquer - Implementation of finding of maxima and minima
- Applications of Divide and Conquer - Finding of power of an element with its Implementation
- Applications of Divide and Conquer - Binary Search
- Applications of Divide and Conquer - Recurrence relation of Binary Search
- Applications of Divide and Conquer - Implementation of Binary Search
- FAANG Interview Question- Two Pointers Problem
- Applications of Divide and Conquer - Merge Sort
- Applications of Divide and Conquer - Implementation of Merge Sort
- FAANG Interview Question on MergeSort - Finding of single sorted array complexity
- Applications of Divide and Conquer - Quick Sort
- Applications of Divide and Conquer - Implementation of Quick Sort
- FAANG Interview Scenario Based Question on QuickSort complexity
- Applications of Divide and Conquer - Randomized QuickSort
- Applications of Divide and Conquer - Selection Procedure
- Applications of Divide and Conquer - Implementation of Selection Procedure
- Applications of Divide and Conquer - Count Of number of an inversions
- Applications of Divide and Conquer - Strassen's Matrix Multiplication

Linked List Data Structure

- Introduction to Linked List
- Insertion of a node in Linked List - Front
- Insertion of a node in Linked List - After a given node
- Insertion of a node in Linked List - End
- Deletion of a node in Linked List
- Searching of a node in Linked List
- FAANG Interview Question - Reversal of a node in Linked List
- FAANG Interview Question - Count of all nodes in Linked List
- FAANG Interview Question - Floyd's Cycle Detection Algorithm

- FAANG Interview Question - Merge Of two Sorted Linked List

Skip List Data Structure

- Skip List- Motivation, Build-in, Search, Insertion and Deletion skip list

Stack and Queue

- Introduction to Stack Data Structure and Push Operation in depth
- Stack- Pop operation
- Implementation of Stack using array and linked list
- Queue- Insertion and Deletion operation
- Implementation of Queue using array and linked list
- FAANG Interview Question - Valid Parenthesis

Hashing Data Structure

- Introduction to Hashing Data Structure
- Hash Function and its types
- Implementation of Hash Functions
- Open addressing - Linear Probing and Primary Clustering
- Open addressing - Quadratic Probing and Secondary Clustering
- Open addressing - Double Hashing
- Chaining
- Load Factor and Rehashing

Tree Data Structure

- Basics of Tree - Full Binary Tree vs Complete Binary Tree vs Almost Complete Binary Tree

Tree Traversal Algorithms

- Tree Traversal Algorithms- Inorder, Preorder and PostOrder
- FAANG Interview Questions on Tree Traversal Algorithm

Binary Search Tree

- Introduction to Binary Search Tree
- Insertion and Inorder Traversal in BST
- FAANG Interview Question- Minimum value in BST
- FAANG Interview Question- Find unique possible BST's
- Searching in Binary Search Tree
- Deletion in Binary Search Tree

Graph Traversal Algorithms

- Basics Of Graph- Simple vs Multigraph, Null vs Complete Graph, Relationship between edges and vertices in Simple Graph
- Introduction to Graph Traversal Algorithms
- Introduction to Depth First Search
- DFS Psuedocode and illustration using an example
- DFS Coding Implementation
- BFS Intro, Psuedocode and illustration using an example
- BFS Coding Implementation

Greedy Algorithm

- Introduction to greedy algorithm

Application of greedy algorithm

- Fractional Knapsack Problem
- Implementation of Fractional Knapsack Problem
- Basics Of Graph- Simple vs Multigraph, Null vs Complete Graph, Relationship between edges and vertices in Simple Graph
- Introduction to Spanning Tree and Minimum Spanning Tree
- Minimum Spanning Tree- Kruskal 's Algorithm
- Minimum Spanning Tree- Prim's Algorithm
- Single Source Shortest Path- Dijkstra's algorithm
- Single Source Shortest Path- Dijkstra's algorithm Implementation
- Huffman Coding
- Optimal Merge Pattern
- Job Sequencing with Deadline

Dynamic Programming

- Introduction to Dynamic Programming

Application of Dynamic Programming

- Fibonacci Series using Dynamic Programming
- 0-1 Knapsack Problem

Research Area- P, NP, NP-Hard and NP-Complete Problems

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Detailed Interview Process to crack FAANG Companies(SDE Roles)

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