



Professional Data Structures & Algorithms

Data Structures and Algorithms are not specific to any programming language. Java (Object Oriented Language) is used as programming language for implementations.

Course Contents

- ✓ Elementary DS: Linked List, Stacks, Queues
- ✓ Trees: General Trees, Binary Trees, B Search Trees
- ✓ Balanced BST
 - AVL Tree
 - Red-Black Tree
- ✓ Hashing
- ✓ Divide-Conquer
- ✓ Sorting & Searching
- ✓ Bit Wise Operations
- ✓ Back Tracking
- ✓ Priority Queues
- ✓ Graphs: Traversals, MSTs, Shortest Paths
- ✓ Greedy Technique
- ✓ Dynamic Programming
- ✓ String Data Structures: Tries, Suffix Trees

Each topic of the course addresses the following:

- ✓ What is its significance?
- ✓ Why is it required?
- ✓ How is it implemented?
- ✓ Where is it applied?

Why Data Structures and Algorithms?

- ✓ Data Structures and Algorithms are the building blocks of any computing system
- ✓ Companies that develop Operating System, DBMS, Application Server, Networking Systems, Search Engine, e-Commerce applications, Social Networking Systems... etc are called Technology Companies.
- ✓ These companies develop computing systems from scratch and research on new computational models, which are in high demand from real world applications.
- ✓ Microsoft, Yahoo, Google, Face book, Amazon, Adobe, LinkedIn, Oracle, Flipkart, Amazon, Snapdeal are the Technology companies to name a few.

- ✓ With growing trend in big data, data analytics, machine learning, data mining, cloud and cluster computing, Data structures and Algorithms has become the skill of demand with more and more companies entering into technology space.
- ✓ These companies provide the best career opportunity and career growth with big pay package for people trained on Data Structures and Algorithms

Course emphasis is on the following

- ✓ Exposure to around 200-250 Programming Interview Questions** with discussions, practice and solutions.
- ✓ Instill basic Concepts, Algorithmic Thinking, Time and Space Complexity, Programming Patterns
- ✓ Train in Choosing and Applying appropriate data structure and/or algorithmic technique rather than on mechanically (blindly) solving programming problems.
- ✓ Intelligent and Smart practice of (Easy, Medium, Hard) problems, not just on theoretical concepts and some easy problems.
- ✓ Actively solving and programming rather than on just listening.
- ✓ Recursion and its different facets.
- ✓ Time and Space complexities for each Problem.
- ✓ Practical's involving cracking the programming interviews of technological companies (Amazon, Adobe, Microsoft, Flipkart, Google, Facebook, Cisco, Akamai ...)

Sample questions covered in the course:

- ✓ Check whether binary tree is balanced or not?
- ✓ In a rotated sorted array, search for an element in $O(\log n)$ time?
- ✓ In a file of billion numbers, find maximum ten numbers given limited RAM.
- ✓ Convert a given Binary Search Tree to Doubly Linked List visa versa
- ✓ Given a string, find all permutations of it.
- ✓ Given computer Network, list Cut Vertices and Cut Bridges if there are any?
- ✓ Given all the software modules with their dependencies, Find out the order in which modules have to be compiled?
- ✓ Given the transportation (road) network, find the shortest distance to go from any source to any destination.
- ✓ Given probabilities of search for each data item, find the best way structure data items so that average search time is optimal.
- ✓ Find the longest word that can be formed from a List of words.

For technical queries reach out to the trainer, Mr Srikanth on 8197375402

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