

Data Structures using C/C++/Java

Duration: 40 Hours

Prerequisites

- Knowledge of C programming.

Course Contents

1. Concepts of Data Structure

- Definition
- Need of Data Structure
- Types of Data Structures
- Efficiency of an algorithm
- Classification of Data Structure

2. Arrays

- Introduction
- Linear Arrays
- Operations on Arrays
- Multidimensional Arrays
- Representation of two-dimensional arrays
- Advantages and Disadvantages of Arrays

3. Lists

- Introduction
- Types of Linked Lists
- Single Linked List and Operations on it
- Double Linked List and Operations on it
- Circular Linked List and Operations on it
- Advantages and Disadvantages of Linked Lists
- Linked Lists Vs. Arrays

4. Stack

- Introduction
- Applications of Stacks
- Operations on Stacks
- Array Representation of Stacks
- Linked Representation of Stacks
- Polish Notations

5. Queue

- Introduction
- Applications of Queues
- Operations on Queues
- Array Representation of Queues
- Linked Representation of Queues
- Circular Queues
- Dequeues
- Priority Queues

6. Trees

- Introduction
- Trees terminology
- Types of trees
- Binary Trees
- Representation of Binary trees
- Tree Traversal
- Binary search Trees
- Heap
- AVL trees

7. Graphs

- Introduction
- Graph Terminology
- Types of Graphs
- Sequential Representation of Graphs
- Linked Representation of Graphs
- Graph Traversal

8. Sorting & Searching Techniques

- Insertion Sort
- Merge Sort
- Quick Sort
- Radix Sort
- Heap Sort
- Selection Sort
- Bubble Sort
- Linear Search
- Binary Search
- Hashing
- Hash Functions
- Collision resolution

9. File Structures

- Physical Storage Media File Organization
 - Organization of records into Blocks
 - Sequential Files
 - Indexing
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