

Data Structures Syllabus

Analysis of Algorithms

- Introduction
- Complexity
- Asymptotic Complexity
- Upper and Lower Bounds
- Big-O Notation
- Classes of Algorithms
- Ω and Θ Notations
- Best, Worst, and Average-Case Complexities
- Examples

Searching and Sorting

- Terminology
- Sequential Search
- Binary Search
- Interpolation Search
- Sorting Terminology
- Analyzing Sorts
- Bubble Sort
- Selection Sort
- Insertion Sort
- Ideal Performance of Sorts
- Merge Sort
- Quick Sort

Arrays and Linked Lists

- Lists
- Arrays
- Linked Lists
- Doubly Linked Lists
- Circular Lists
- Sparse Tables

Stacks and Queues

- Stacks
- Queues
- Priority Queues

Trees

- Introduction
- Binary Trees
- Binary Search Trees

AVL Trees

- The Need for Balanced Trees
- Balance of a Node
- AVL Trees
- Node Structure
- Insertion into an AVL Tree

Graphs

- Classification
- Definitions
- Operations on Graphs
- Graph Representation
- Graph Traversals
- Dijkstra's Algorithm
- Minimum Spanning Trees
- Topological Order

Hash Tables

- Introduction
- Hash Functions
- Collision Resolution
- Measuring Hashing Performance

Heaps and Heapsort

- Heaps
- Heapsort