DevikTech

Explore Your Potential

DATA STRUCTURE

Topics:-

1.Array
2.String
3.Recursion
4.Linked List
5.Stacks
6.Queue
7.Searching
8.Hashing
9.Sorting
10.Trees
11.Graphs

UNIT 1:- 1.Introduction
2.Array
3.String
4.Recursion

UNIT 2:-
5.Linked List
6.Stacks
7.Queue

UNIT 3:-
8.Searching
9.Hashing
10.Sorting

UNIT 4:-

11.Trees

UNIT 5:-

12.Graphs

Duration For Course(2 months):-

UNIT 1	--	*2 weeks*
UNIT 2	--	*2 weeks*
UNIT 3	--	*2 weeks*
UNIT 4	--	*1 weeks*
UNIT 5	--	*1 weeks*

UNIT 1

1. Introduction

1. *Basic Terminology*
2. *Algorithm Complexity*
3. *Time-Space trade-off*

2.Array

1. *Array Introduction*
2. *Single and Multidimensional Arrays*
3. *Practice Questions*

3.Strings

1. *String Introduction*
2. *String operation*

3. *Practice Questions*

4.Recursion

1. *Recursion Definition*
2. *Finding the complexity of Recursion*
3. *Tower of Hanoi problem*
4. *Backtracking*
5. *Practice Question*

UNIT 2

1.Linked List

Single Linked list

Introduction
Creating a Linked List
Traversing a Linked List
Adding a node in Front
Adding a node in last
Adding a node in middle
Deleting a node in front
Deleting a node in middle
Deleting a node in last
Reversing a linked list
Check whether a linked list is a Palindrome or not
Detect a loop in a linked list
Find middle element in a linked list

Doubly Linked List

Introduction
Insertion

Deletion
Reverse a linked List

Circular Linked List

Introduction
Traversal

2.Stacks:

Introduction :-
Operation on stack:PUSH and POP
Array Representation of Stack
Linked Representation Of Stack
Queue using Stacks
Reverse a stack using recursion

Application of stack:
Conversion:Infix to Postfix
Infix to prefix
Postfix to Infix
Prefix to Infix
Prefix to Postfix

3.Queues:
Introduction
Operations on Queue:
Create
Add
Delete
Full
Empty

Reversing a Queue

Reversing a queue using recursion

Circular Queues
D-Queues
Priority Queues

UNIT 3

1.Searching

Linear Search
Binary Search
Comparison and analysis

2.Sorting

Bubble Sort
Insertion Sort
Selection Sort
Merge Sort
Quick Sort
Heap Sort
Comparison and analysis

3.Hashing

Introduction
Hash Table
Hash Functions
Hash Table Implementation

UNIT 4

1.Trees

Basic Terminology
Binary Trees
Binary Trees Representation
Algebraic Expressions
Complete Binary Trees
Extended Binary Trees
Traversing Binary Trees
Construct Tree from given Inorder and Preorder traversals.
Construct a tree from Inorder and Level order traversals.
Check for Children Sum Property in a Binary Tree.
Check if a given Binary Tree is SumTree.

Binary Search Tree(BST)
Insertion
Deletion
Find the node with minimum value in a Binary Search Tree.
A program to check if a binary tree is BST or not.
Lowest Common Ancestor in a Binary Tree.
Complexity of Search algorithm

Path Length

UNIT 5

Graphs

Basic Terminology
Representations
Graphs
Multi-Graphs
Sequential representation of graphs
Adjacent Matrices
Traversal
Connected Component
Spanning Tree
Minimum Cost Spanning Tree

Algorithm

1.Analysis of Algorithm.

2.Searching of Algorithm.

3.Sorting of Algorithm.

4.Greedy Algorithm.

5.Dynamic Programming.

6.Divide and Conquer.

7.Backtracking.

8.Branch and Bound.