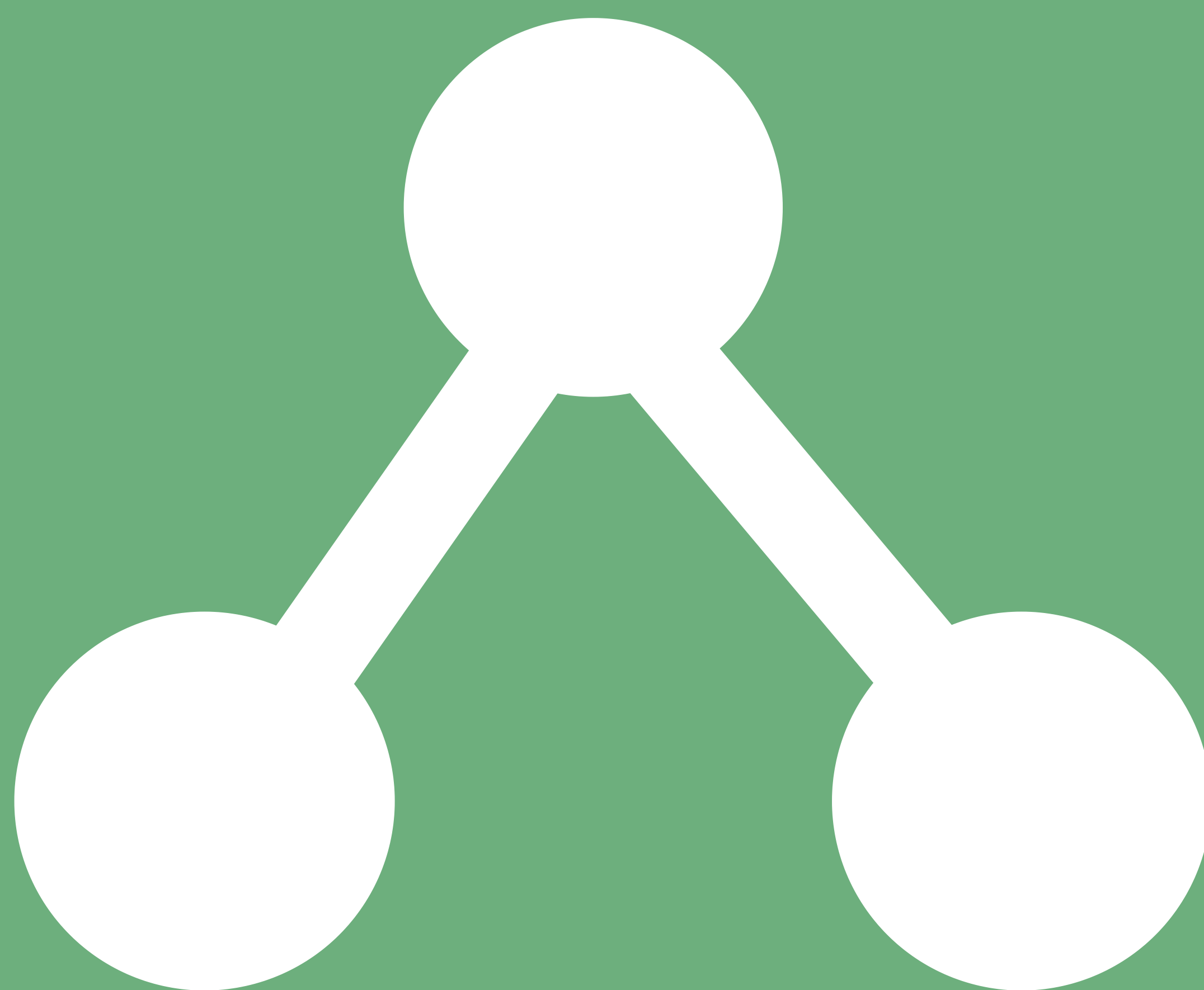




GeeksforGeeks

DATA STRUCTURE IN C



DETAILED COURSE SYLLABUS

INTRODUCTION

- Analysis of Algorithms
- Asymptotic Notation
- Big O notation
- Omega notation
- Theta notation
- Analysis of loops
- Time Complexity and Space Complexity

RECURSION

- Introduction
- Application
- Recursion practices
- Tail Recursion
- Writing Base Cases
- Print 1 to n and n to 1 using recursion

ARRAYS

- Introduction
- Operations on array
- Average of an array
- Maximum in array
- Second largest in array
- Check if array is sorted
- Reverse an array
- Rotate an array

SEARCHING

- Linear Search and its analysis
- Binary Search and its analysis
- Index of first and last occurrence
- Count occurrences in a sorted array

SORTING

- Bubble Sort
- Selection Sort
- Insertion Sort
- Merging two sorted arrays
- Introduction of merge sort, algorithm and analysis
- Partitioning an array
- Lomuto Partitioning and Hoare's Partitioning
- Implementation of Quick Sort and analysis

MATRIX

- Introduction and Passing 2D arrays as arguments
- Matrix boundary traversal
- Matrix in snake pattern
- Transpose of a matrix
- Spiral traversal of matrix
- Searching in row-wise and column-wise sorted matrix

HASHING

- Concept of hashing
- Direct Address Table
- Collision Handling
- Chaining
- Open addressing
- Double Hashing

STRINGS

- Introduction
- Escape sequences
- Reverse a string
- String Comparisons
- Operations on String
- Pattern Searching
- Check for Anagram
- Check for Palindrome

LINKED LIST

- Introduction
- Implementation and Applications
- Traversal of Linked List
- Insertion at beginning and end in Linked List
- Sorted insert in Linked List
- Delete first and last node of Linked List
- Reverse a linked list.

DOUBLY LINKED LIST

- Introduction
- Advantages and Disadvantages
- Insertion at beginning and end in Doubly Linked List
- Delete first and last node of Doubly Linked List
- Reverse a Doubly Linked List

CIRCULAR LINKED LIST

- Introduction
- Advantages and Disadvantages
- Insertion at beginning and end in Circular Linked List
- Delete head and Kth node of Circular Linked List.

STACK

- Introduction
- Array implementation
- Linked List implementation
- Prefix, Infix and Postfix expressions, their conversion and evaluation.

QUEUE

- Introduction
- Implementation using linked list
- Insertion in queues, Deletion in queues
- Implementing stack using queues and vice versa
- Circular queues Introduction and applications
- Implementing using array and linked list.

DEQUE

- Introduction
- Applications and array implementation.

TREES

- Introduction of Trees
- Applications
- Binary Tree
- Traversal of Tree
- Implementation of Preorder, Inorder and Postorder traversal
- Iterative Inorder and Preorder

BINARY SEARCH TREES

- Introduction
- Insert, Ceil, Floor and Search in BST.

HEAP

- Introduction
- Implementation of Heap
- Binary Heap(Heapify and Extract)
- Binary Heap(Decrease Key, Build Heap and Delete)

GRAPH

- Introduction
- Representation – Adjacency List and Adjacency Matrix
- Implementation of Adjacency List
- Application of BFS and DFS