C WITH DATA STRUCTURE & ALGORITHMS

C PROGRAMMING LANGUAGE CONTENT

C Language Contents:

- Introduction to C Language
- Role Of Compilers and Assemblers
- Procedural programming Approach
- Top to Bottom Approach

Introduction to C Basic

- Keywords
- Data types
- Variables
- Constants
- Identifiers
- Tokens
- Operators
- memory management in prog

Flow Control Statements

- Jump statements
  - Goto
  - Break
  - Continue
- Conditional Statements
  - If statement
  - If else statement
  - Nested if else
  - If else if ladder
  - Switch case statement
- Iteration statements
  - For loop
  - While loop
  - Do while loo[
  - Nested loops
  - patterns

Arrays:

- Introduction to Arrays
- Several examples of Arrays like insert, delete, counter occurrence of items etc.
- Searching
- Sorting
- 2 D Array
- Several Examples of 2 D arrays
- Multidimensional Array s

Strings:

- Introduction to Strings
- String handling built in functions
- Several examples of Strings
- Array of Strings
- Searching in Array of Strings
- Sorting in Array of Strings

POINTERS

- Introduction to pointers
- Pointer expressions
- Types of Pointers
  - Void Pointer
  - NULL Pointer
  - Wild Pointer
  - Dangling Pointer
- Various examples of pointers
- Pointer Arithmetic's
- Array using pointers
- String using pointers
- Pointers in Functions
- deadlock pointer

FUNCTIONS

- Introduction to functions
- Types of functions
- Nesting of functions
- Various examples of functions
- Strings passing is functions
- Array Passing in Functions
- Pointer passing is functions
- Function Returning Address
- Function returning address
- Recursion
- Various Examples and Interview Questions on Recursion and Function
- Storage classes

STRUCTURE

- Introduction to structure
- Advantages of structure
- Array of structure
- Structure using pointer
- Structure with functions
- Applications of structure

Union

- Introduction to union
- Advantages of union
- Difference between union and structure

Enum

- Introduction to enum

DYNAMIC MEMORY ALLOCATION

- Introduction to dynamic memory allocation
- Advantage of dynamic memory allocation
- malloc(), calloc(), realloc(), free()
- Array implementation using dynamic memory allocation

Macro and Compiler Control Directives

- #define
- #undef
- #ifdef
- #ifndef
- #elif
- ## Etc.

FILE MANAGEMENT

- Introduction to file management
- File opening modes
- Opening and closing a file
- Input output operations on file
- Applications of file management
- Project

DATA STRUCTURE AND ALGORITHMS CONTENT (using C)

INTRODUCTION TO DATA STRUCTURE AND ALGORITHMS

- What is data structure
- Benefits of data structure
- Types of data structure
- Introduction to algorithms
- Types of Algorithms
- Time and Space Complexity
- Interview Questions

LINEAR DATA STRUCTURE

- Array
- String
- Link list
  - Introduction to link list
  - Array vs. link lists
  - Types of link lists
  - Implementation of link list
  - Singly link list
  - Insertion(at first position, last position and at used specific position) , deletion(at first position, last position and at used specific position) , traversing operations in Singly linked list
  - Doubly link list
  - Insertion (at first position, last position and at used specific position), deletion(at first position, last position and at used specific position) , traversing operations in Doubly linked list
  - Circular link list
  - Insertion(at first position, last position and at used specific position) , deletion(at first position, last position and at used specific position) , traversing operations in Circular linked list
  - Application of link list
  - Interview Questions
- Stack
  - Introduction to stack
  - Stack using array
  - Stack using linked list
  - Applications of stack
  - Reverse Polish Notations(Infix to Postfix and Infix to Prefix)
  - Interview Questions
- Queue
  - Introduction to queue
  - Queue using array
  - Queue using linked list
  - Applications of queue
  - Introduction to circular queue

- Application of Circular queue
  - Introduction to DeQueue(Double Ended Queue)
  - Application of Dequeue
  - Priority Queue
  - Interview Questions

Non-linear data structure

- Tree
  - Introduction to trees
  - Types of trees
  - Implementation of tress
  - Binary tree
  - Binary search tree
  - AVL tree
  - Threaded binary tree
  - M way tree
  - M way search tree
  - B tree
  - Heap
  - Various operations on trees
  - Application of tress
  - Interview Questions

Searching and sorting

- Searching in arrays
- Searching in strings
  - Linear Search
  - Binary Search
- Sorting
- Various sorting techniques
  - Selection sort
  - Bubble sort
  - Insertion sort
  - Quick sort
  - Heap sort
  - Merge sort
  - Radix Sort

Graph

- Introduction of graph
- Types of graphs
- Implementation of graph using Adj. Matrix and Adj. list
- Various operations on graphs
- Shortest path search in graph
  - Floyd Warshall Algorithm
  - Dijkstra Algorithm
- Minimum spanning tree
  - Kruskal's Algorithm
  - Prims Algorithm
- Applications of graphs
- Interview Questions

Hashing

- Introduction of hashing
- Hash table
- Applications of hashing
- Interview Questions

Interview Questions

Project