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In C Programming and Data Structures course, you will gain in-depth knowledge regarding fundamentals of computer, preprocessor, memory organisation, compiler, linker, data types & operators and variables & qualifiers. The course is best suited for professionals who wish to brush up their C programming and data structure skills and knowledge. During the course, you will learn how to implement various logic in C programming with the help of if-else construct, loops, data structures and more. Moreover, you will gain comprehensive knowledge about the concept of functions used in C programming and also get an understanding of searching and sorting algorithms such as binary sort, quick sort and more. The training program includes topics such as Fundamentals of C and Data Structures, Basics of I-O in C, Data Types in C, Control instructions in C, Recursion in C, Pointers and Arrays, Structure and Union, linked lists, Tree and Searching, Sorting, Dynamic Memory Allocation and many more.

Prerequisites

There are no prerequisites for this course. Anyone who wants to learn the basics of programming can attend this course.

Course Objectives

Upon successful completion of the course, you will be able to:

- Understand the basics of C programming
- Implement various features of C programming including variables, functions, data types and operators, linked lists, strings, pointers, arrays and more
- Gain deep knowledge of data structures
- Become proficient in the concepts and terminologies of C and data structures

Fundamentals of C and Data Structures

- Basics of computer- CPU, ALU, Register, Cu, Primary Memory, ROM, RAM, Storage devices,
- Computer Languages
    - Low-level language
    - Machine language
    - Assembly language
    - High-level language
- Number System
    - Conversion of Decimal to Binary
    - ASCII
- Compiler and Interpreter
    - Compiler Diagram
    - Interpreter Diagram

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Introduction to C program

- Structure of C program
- program building C program
- Practice Exercises

Basics I-O in C

- Input and Output in C
- Formatted Output with printf
- Format Conversion specifies scanf
- Practice Exercises

Instructions in C

- Instruction types
- Arithmetic Instructions
    - Types of Arithmetic Instruction
        - Integer mode Arithmetic statement
        - Real mode Arithmetic Statement
        - Mixed mode Arithmetic Statement
    - Associativity of operators

Introduction to Data Types in C/h3>

- Overview of C Data Types
- Void type
- Declaration
- Definition and Initialization
- Variable Qualifier
- Operators

Introduction to Control instructions in C

- Control Instruction types
- Decision control structures
- Conditional operator
- Case-control structure
- Switch case-control
- Need of break in switch case
- Using break keyword

C Functions

- Define functions
- Structure of C program and C function

Introduction to Recursion in C

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- Overview of Recursion
- Functions of Recursion
- Recursion vs. Iteration

Pre-processor in C

- Define pre-processor
- Program flow
- Benefits of pre-processor
- Pre-processor directives
- Predefine macros

Introduction to arrays in C

- Array elements
- Passing array to a function
- 2-D array

String in C

- Memory presentation of string
- Printing string
- Operations on string

Introduction to Structure and Union

- Differentiate between Structure and Array
- Declaring structure
- Initialization and accessing structure variable
- Array of Structure
- Passing structure in function
- Structure vs. Union

File I-O in C

- File I/O
- Reading/Writing from file
- Example for writing a file
- Binary file I/O with example

Introduction to Pointers in C

- Pointer Arithmetic in array
- Advice and precaution
- Practice exercises

Overview of Pointers and Arrays

- Multi-Dimensional Arrays

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- Arrays from pointers perspective

Dynamic Memory Allocation

- Overview of Dynamic Memory Allocation
- Allocating memory dynamically

Introduction to linked lists

- Define linked list
- Linked list terminology
- Creating link list

Overview of Tree and Searching

- Define binary tree terminology
- Tree traversal

Introduction to Sorting

- Sorting applications
- Sorting methods
- Bubble sort
- Quicksort
- Practice questions

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