



# C,C++,Data Structure

**Mode of Training:** Online, Classroom, Corporate

**Faculty:** Mr. JANARDHAN

**Course Duration:**



**Course  
Curriculum**

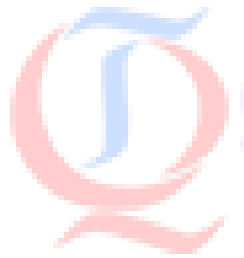
# C Programming

## Overview of the Programming Languages

- What is C Language
- Why C Language
- Future in C Language
- Summary

## Setting up and Installing C Language

- Prerequisite in C Language
- Installation of C
- Summary



## Data Type, Constants & Variables

- What is Data Types in C Language with practical
- Integers, long and short in C Language with practical
- Integers, signed and unsigned in C Language with practical
- Chars, signed and unsigned in C Language with practical
- Floats and Doubles in C Language with practical

- Constants in C with practical
- Variables in C with practical
- Keywords in C with practical
- How to get input from user with practical
- How to display output to user with practical
- Summary

## Statement

- IF-Else Statement in C Language with practical
- for Loop in C Language with practical
- While Loop in C Language with practical
- Do-While Loop in C Language with practical
- Break in C Language with practical
- Continue in C Language with practical
- Switch in C Language with practical
- Summary

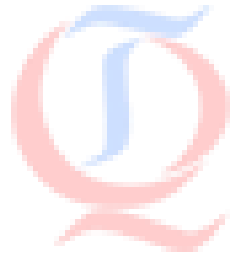
## Function

- What is a Function in C Language with practical
- Passing Values between Functions in C Language with practical

- Call by Value in C Language with practical
- Call by Reference in C Language with practical
- Summary

## Pointer

- An Introduction to Pointers
- Pointer Notation in C Language
- Back to Function Calls in C Language with practical
- Recursion in C Language with practical
- Summary



## Preprocessor

- The C Preprocessor in C Language
- Features of C Preprocessor
- Macro Expansion in C Language
- Macros with Arguments with practical
- Macros versus Functions with practical
- File Inclusion in C Language with practical
- #if and #elif Directives with practical

- Miscellaneous Directives in C Language
- #undef Directive with practical
- #pragma Directive with practical
- Summary

## Arrays

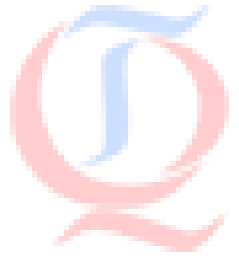
- What are Arrays in C Language
- A Simple Program Using Array
- How to Initialize Array in C Language with practical
- Passing Array Elements in C Language to a Function with practical
- Pointers and Arrays in C Language with practical
- Passing an Entire Array to a Function in C Language with practical
- Two Dimensional Arrays in C Language with practical
- Initializing a 2-Dimensional Array with practical
- Pointers and 2-Dimensional Arrays with practical
- Pointer to an Array with practical
- Passing 2-D array to a Function with practical
- Array of Pointers with practical
- Three Dimensional Array with practical
- Summary

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## String

- What are Strings in C Language
- How to get length of a string in C Language using strlen( ) with practical
- How to copy a string in C Language using strcpy( ) with practical
- How to concatenate a string in C Language using strcat( ) with practical
- How to compare two string in C Language using strcmp( ) with practical
- Summary

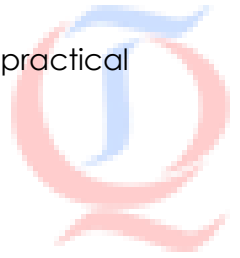
## Structures



- What is Structures in C Language
- Why Use Structures in C Language
- Declaring a Structure in C Language with practical
- Accessing Structure Elements in C Language with practical
- How Structure Elements are Stored with practical
- Array of Structures in C Language with practical
- Additional Features of Structures with practical
- Uses of Structures with practical
- Summary

## File Operation

- File Input /Output in C Language with practical
- File Operations in C Language with practical
- Opening a File in C Language with practical
- Reading from a File in C Language with practical
- Closing the File in C Language with practical
- Counting Characters, Tabs, Spaces, with practical
- A File-copy Program in C Language
- Writing to a File in C Language with practical
- File Opening Modes
- String (line) I/O in Files
- Summary



## Operator & Enum

- Operations On Bits in C Language with practical
- Bitwise Operators with practical
- One's Complement Operator with practical
- Right Shift Operator with practical
- Left Shift Operator with practical

- Bitwise AND Operator with practical
- Bitwise OR Operator with practical
- Bitwise XOR Operator with practical
- Enumerated Data Type with practical
- Uses of Enumerated Data Type with practical
- Summary

## C++ Programming



### 1) Beginning with C++

- What is C++, its Applications, and Advantages etc.
- Difference between C and C++. Major and minor difference.
- Creating C++ source file, Editing, Compiling, Linking, Debugging. Etc.
- Make File Utility, Command Line Arguments etc.

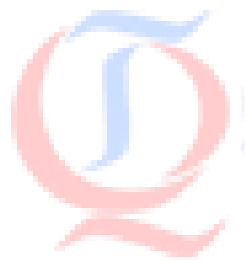
### 2) Explaining Procedure oriented Language(C) and Object Oriented Language. (C++)

- Look at Procedure -oriented Programming
- A Brief Look at Object Oriented Programming (OOP).
- Applications of OOP, Benefits of OOPS

### 3) C++ Tokens, Expressions, and Control Structure.



- Tokens
- C++ keywords
- Basic Data Types
- User defined Data Types
- Derived Data Types
- Operators in C++
- Reference Variables
- Memory management operators
- Manipulators
- Operator Overloading
- Operator Precedence
- Control Structure



#### 4) Functions In C++

- Different forms of functions
- Function prototyping
- Call by Reference
- Inline Functions
- Function overloading
- Friend and virtual functions
- Math library functions

#### 5) Classes And Objects

- C Structure revision
- Defining classes, defining member functions.
- Declaration of objects to class

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- access to member variables from objects etc
- Different forms of member functions dependence on access specifies (i.e. Private, public, protected).
- Array of objects
- Objects as function arguments
- Friendly function
- Returning objects
- Pointers to members h) local classes.

## 6) Memory Management and pointers.

- Using new operator, comparison of new over malloc, calloc and realloc etc.
- Memory freeing using delete operator.



## 7) Constructor and Destructor

- intro
- constructors,
- parametrized constructors
- Multiple constructors in class
- dynamic initialization of objects
- Destructors.

## 8) Operator Overloading and type conversion

- intro
- defining operator overloading
- overloading -(unary, binary operators)
- overloading binary operators using friends
- Rules for overloading operators
- type conversion

## 9) Inheritance – extending class

- Intro
- types of inheritance

- single inheritance
- multiple inheritance
- Multilevel inheritance
- hierarchical inheritance
- Hybrid inheritance etc.
- virtual base class
- abstract class
- Constructors in derived class.

#### **10) Pointer, Virtual Functions, Polymorphism.**

- intro
- pointers
- pointers to objects
- this pointer
- pointers to derived class
- virtual functions
- Pure virtual functions etc.

#### **11) Managing Console I/O Operations**

- intro
- C++ streams
- ++ stream classes
- Unformatted / formatted I/O operations.
- Managing output with manipulators.

#### **12) Working with files.**

- intro
- creating/ opening / closing / deleting files
- file pointers and their manipulators
- updating file random access to file
- Error handling during file operations.
- Command line arguments.

#### **13) Templates**

- intro
- class templates
- function templates
- Overloading of template function.

#### **14) Exception Handling**

- intro
- Exception handling throwing, catching, rethrowing an exceptions, specifying exceptions etc.

#### **15) introducing STL (Standard template library)**

- intro
- components of STL
- containers
- algorithms
- iterators
- function objects

#### **16) String Manipulation in C++**

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- intro
- creating objects
- manipulating string objects
- relational operators
- string characters
- Accessing characters in strings.

### 17) New Features of C++

- new data types
- new operators
- class implementation
- namespace scope
- operator keywords
- New headers etc

### 18) object oriented system development

- intro
- procedure oriented paradigms, development tools
- object -oriented paradigms developments tools
- implementation
- Prototyping paradigm.

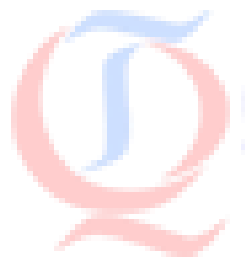
# Data Structure



### Data Structures:

- Introduction to DS
- Introduction to Linked list
- Single Linked List
- Double Linked List
- Circular Linked List
- Stack and Queue operations with Linked List
- Searching and Sorting Technique's
- Linear Search
- Binary Search

- Bubble Sort
- Selection Sort
- Insertion Sort
- Merge Sort
- Heap Sort
- Quick Sort
- Radix Sort



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