

# C & C ++ Training

## Getting Started

- Brief Introduction
- Programming Language
- About C Programming
- C Character Set
- Constants, Variables & Keywords
- Constants in C
- Variables in C
- Writing a C Program
- Instructions and Assignments
- Basic Operators in C Programming

## The Decision Control Structure

- Decisions Control Structure & the If Statement
- The if-else Statement
- Use of Logical Operators
- Different types of Operators
- Points to remember

## Loop Control Structure

- Loops and the While loop
- While Loop
- For Loop
- Operators in Loop
- The Odd Loop
- Break Statement
- Continue Statement
- do-while loop
- Tips to remember

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## Case Control Structure

- Decisions using switch
- The Tips and Traps
- Switch versus if-else Ladder
- The goto keyword

## Functions and Pointers

- About Functions
- Passing Values between Functions
- Scope Rule of Functions
- Calling Convention
- One Dickey Issue
- Advanced Features of Functions
- Function Declaration and Prototypes
- Call by Value or Call by Reference
- An Introduction to Pointers
- Pointer Notation
- Function Calls
- Basics of Call by value and call by reference
- Conclusions
- Recursion
- Recursion and Stack
- Adding Functions to the Library

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## Data Types Revisited

- Data type
- Integer number variables
- Integers, signed and unsigned
- Chars, signed and unsigned
- Floats and Doubles
- Issues related to Data types
- Storage Classes in C
- Automatic Storage Class
- Register Storage Class
- Static Storage Class
- External Storage Class
- To study the Ground rules for the Storage Class

## The C Preprocessor

- Features of C Preprocessor
- Preprocessor and Macro Directives
- Macros with Arguments and Macros versus Functions
- Various Directives

## Arrays

- About Array
- Usage of Arrays
- Pointers and Arrays
- Passing an Entire Array to a Function
- Two Dimensional Arrays
- Initializing a 2-Dimensional Array
- Memory Map of a 2-Dimensional Array

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- Initializing a 2-Dimensional Array
- Memory Map of a 2-Dimensional Array
- Pointers and 2-Dimensional Arrays
- Pointer to an Array 295
- Passing 2-D array to a Function
- Array of Pointers
- Three Dimensional Array

## Pupating on Strings

- What are Strings?
- Pointers and Strings
- Standard Library String Functions
- Two-Dimensional Array of Characters
- Array of Pointers to Strings
- Limitations of Array of Pointers to Strings

## Structures

- Why Use Structures?
- Declaring a Structure
- Accessing Structure Elements
- Array of Structures
- Additional Features of Structures
- Uses of Structures

## Console Input/output

- Types of I/O
- Formatted Console I/O Functions
- `printf()` and `scanf()` Functions
- Unformatted Console I/O Functions

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## File Input/Output

- Data Organization
- File Operations
- Opening a File
- Reading from a File
- Trouble in Opening a File
- Closing the File
- Counting Characters, Tabs, Spaces
- A File-copy Program
- Writing to a File
- File Opening Modes
- String (line) I/O in Files
- The Awkward Newline
- Record I/O in Files
- Text Files and Binary Files
- Record I/O Revisited
- Database Management
- Low Level Disk I/O
- A Low Level File-copy Program
- I/O Under Windows

## More Issues in Input/output

- Using argc and argv
- Detecting Errors in Reading/Writing
- Explanation
- Standard I/O Devices
- I/O Redirection
- Redirecting the Output
- Redirecting the Input & Both Ways at Once



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## C++ Programming

(Duration: 35 hrs.)

- Procedure v/s Object Oriented programming.
- Benefits of oops
- Different oops features
- Data types, variables
- Constants, expressions
- Operators (Arithmetic, Logical Relational)
- Operators (Conditional, Assignments)
- Type conversion and casting
- Control structure (if, if-else, nested if-else)
- Control structure (Switch, While loop)
- Control structure (for loop)
- Control structure (do while loop)
- Control structure (break, continue)
- Control structure (nested loops)
- Functions (pass by value, pass by reference)
- Functions overloading
- Functions (in line function, friend function)
- Classes and objects (class definition, public)
- Classes and objects (private)
- Classes and objects (protected members)
- Constructor and destructor (characteristics)
- Default constructor, constructor overloading
- Parameterized constructor, destructor.
- Copy constructor, operator overloading
- Inheritance (base and derived class)
- Single and multi level inheritance.
- Multiple, hierarchical.
- Hybrid, multipath inheritance.
- Abstract class, virtual base class.
- Virtual function.