GeeksforGeeks

Get Started with

C Language

Detailed
Course Syllabus

1. C Basics

- Background Part 1 (IO Devices, CPU and Memory)
- Background Part 2 (Computer Organization & Operating System)
- Why Do We Need Programming Language
- C Introduction
- C standards and Implementation
- Basic C Terminology
- How Does C Program Runs
- Writing first Program in C
- Comment in C

2. Variables and Data Types

- Variables in C
- Variables Naming Rules
- Data types in C
- Ranges of Data Types in C
- Operator sizeof() in C
- Global Variable and Scope
- Const in C
- Static Variables in C
- Literals in C
- Type Conversion in C
- Swap two Numbers

3. Input and Output in C

- Input and Output in C
- printf() in C
- scanf() in C
- fgets in C
- Format Specifiers for Integers
- Format Specifiers for floating point number
- Other format Specifiers
- Width and precision in printf()
- A Buffering example in C
- Escape Sequence in C

4. Operators

- Arithmetic Operators
- Unary Arithmetic Operators
- Comparison Operators
- Assignment Operators
- Bitwise Operator in C (AND, OR and XOR)
- Bitwise Operator in C (Left Shift, Right Shift and NOT)
- Signed Number Representation and Bitwise Not
- Operator Precedence & Associativity
- Day before N days
- Sum of N Natural Numbers
- Last Digit of a Number

5. Flow Control

- If Else in C
- If Else Examples in C
- Else if with Example in C
- Switch in C
- Even Odd Game
- Largest of Three Numbers
- Leap Year
- Simple Calculator

6. Function in C

- Functions in C
- Application of Functions
- Function Declaration & Definition
- How Function Works
- Inline Function
- Practice Problems on C Functions
- Recursion Practice Questions
- First Digit of a Number
- Prime Factorization

7. Loops

- While Loop in C
- For Loop in C

- Do While Loop in C
- Break in C
- Continue in C
- Nested Loop in C
- Pattern
- Square Pattern
- Triangle Pattern
- Inverted Triangle Pattern
- Factor of Number
- Check for Prime
- Next Prime Number
- All Divisors of a Number
- GCD & LCM of Two numbers
- Fibonacci Numbers
- Count Digits of a Number
- Table of a Number

8. Array

- Introduction to Array in C
- Declaring and Initializing Arrays
- Accessing Array Element
- Size of an Array in C
- Array Traversal in C
- Different Types of Arrays
- Check if Array is Sorted
- Count Distinct in an array
- Sum of an Array
- Average of and Array
- Maximum in an Array

9. Pointers

- Address and Dereference Operators in C
- Introduction to Pointers in C
- Application of Pointers in C
- Function Parameters and Pointers
- Array Parameters and Pointers
- Pointer Arithmetic
- Void Pointer in C
- NULL in C

- Pointer vs Arrays
- Pointer to Pointer in C

10. Dynamic Memory Allocation

- Memory Structure of a Program
- malloc(), calloc() and free()
- Memory Leak

11. String in C

- String in C (Introduction)
- String Syntax, Size and Length in C
- String Comparison in C
- String Copy in C
- String Concatenation in C
- Pattern Searching
- Strncat(), strncmp(), and strncpy()
- Substring search in C
- String Tokenization in C
- Reverse a String
- Check for palindrome
- String Binary to Decimal
- String Decimal to Binary

12. Multi Dimensional Array in C

- Multi Dimensional Array in C
- Passing 2D Arrays as Argument To Functions
- Transpose of a Matrix
- Matrix Multiplication

13. Structure and Union

- Struct in C
- Structure Variable Initialization
- Structure Arrays
- Structure Pointer
- Structure Alignment
- Reason for Structure Alignment in C
- Union in C
- Application of Union

14. Advanced

- Function Pointers in C
- Passing Function to Pointers
- File Handling in C
- Read from a File
- Write to a File