Lets learn C

C Programming Learning Curriculum

Unit 1: Basics of C Programming

1.1 Compilation Process

- Overview of the compilation process
- Compiler phases: preprocessing, compilation, assembly, linking

1.2 Syntax and Semantics

- Understanding syntax and semantics in C
- Common syntax errors and semantic errors

1.3 Variables and Data Types

- Declaring variables
- Basic data types: int, float, char
- User-defined data types (struct)

1.4 Arithmetic Expressions and Conditional Branching

- Arithmetic operators and expressions
- Conditional statements (if, else)

1.5 Relational Operations and Mixed Operands

- Relational operators
- Handling mixed operands and type conversion

1.6 Bit Operations and Assignment Operator

- Bitwise operators
- Use of assignment operator

1.7 Operator Precedence and Associativity

- Understanding operator precedence
- Associativity rules

1.8 Structure of C Program

- Components of a C program
- Writing and executing the first C program
- Overview of the C language components

1.9 Standard I/O in C

- Input/output functions (printf, scanf)
- Reading and writing data with standard I/O

Unit 2: Control Flow and Preprocessors

2.1 Applying If and Switch Statements

- Conditional branching with if
- Switch statements and case handling

2.2 Nesting If and Else

- Nested if and else structures
- Complex conditional branching

2.3 Use of Break and Default with Switch

- Implementing break and default cases in switch

2.4 Program Loop and Iterations

- Using while, do-while, and for loops
- Multiple loop variables

2.5 Use of Break and Continue Statements

- Utilizing break and continue in loop constructs

2.6 Standard C Preprocessors

- Defining and calling macros
- Conditional compilation using preprocessor directives
- Passing values to the compiler using -D flag

Unit 3: Functions and Arrays

3.1 Introduction to Functions

- Importance of functions in C
- Function prototypes and declarations

3.2 Types of Functions and Nesting

- Understanding different types of functions
- Nesting functions within each other

3.3 Recursion and Recursive Functions

- Basics of recursion
- Writing and using recursive functions

3.4 Definition of Arrays

- Declaring and initializing arrays
- Array notation and representation

3.5 Manipulating Array Elements

- Accessing and modifying array elements
- Multidimensional arrays

3.6 Character and String Arrays

- Working with character arrays

- String handling functions in C

Unit 4: Pointers, Structures, and Unions

4.1 Introduction to Pointers

- Basics of pointers
- Declaration and initialization of pointers

4.2 Accessing Address of Variables

- Using the address-of operator (&)
- Pointer operators in C

4.3 Pointer Arithmetic and Dynamic Memory Allocation

- Performing arithmetic with pointers
- Allocating and freeing memory dynamically

4.4 Introduction to Structures

- Defining and declaring structures
- Accessing structure members

4.5 Array of Structures and Unions

- Working with arrays of structures
- Understanding unions and their differences with structures

Unit 5: File Handling

5.1 Basics of File Handling

- Introduction to file handling in C
- File pointers and their usage

5.2 Primary File Handling Functions

- Functions for file operations (fopen, fscanf, fprintf, fseek, frewind, fclose)

- Handling End of File (EOF)

This comprehensive curriculum covers the essential aspects of C programming, providing a structured path for learners to build a strong foundation and progress to more advanced topics.