

Training | Internships | Projects | Product Development

C Lang & C ++

Course Contents Proposed Hours - 50

A Unit of Mass Ventures

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<u>C Lang & C ++</u>

C is a programming language developed at AT & T's Bell Laboratories of USA in 1972 by Dennis Ritchie. Make it ideal language for system programming. The ability of C is to manipulate bits, byte and addresses. It can can be used repeatedly in different application. A programmer can easily create his own function.

Basics of C Programming

History of C C program structure Programming style Standard library routines New line character Adding comments Program compilation and Execution Data types, Variables and constants C operators, Relational operators Increment or decrement operators Bit Operators, logical operators Input/Output • Escape Sequence The getchar, The putchar Type conversions Summary and review questions, lab exercises **Control Flow Structures** Sequential control structures Selective control structures (The if, else if, if else if statement) The switch case statements The do while construct The for-loop, Comma operator The break statements The continue statement, The goto statement Summary and review questions Lab exercise

Arrays & String Functions

Single dimensional arrays, Multidimensional arrays, Strings and string functions Review question and Lab exercises

Pointers

Introduction, Understanding pointers Pointer declaration Accessing the address of the variable

Declaring the pointer variable Pointer manipulation Pointers arithmetic Using multidimensional arrays Pointers and character strings Pointers as functional Arguments Functional Returning pointers Pointers to Functions Pointers to Structures Summary & Review Qestions, Lab Exercises **Functions** User Defined functions Function definition Arguments Passing values to Functions Return values based on conditions Function categories Passing Arrays to Functios, Passing Strings to Functions, Storage classes Automatic Variables External variables Static Variables **Recursive functions** Functions with Arrays Summary & Review questions, Lab exercise Structures & Unions Introduction structure, Structure declaration and definition, Nested structures, Accessing Structure Members, Structure Initialization, Copying and Comparing, Structure Variables, Operation on individual members, Arrays of structures File Handling & File I/O

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Introduction to files File handling Defining and Opening a file (fopen) Closing a file Character I/O from files Error handling during I/O Operations The NULL return value The stdin, stout and stderr pointers, Line I/O with files File I/O using structures Writing records onto files, Reading records from files Sumary and Review questions, Lab exercise

C++ Introduction

Overview • Syntax Notation Evolution of C++ Lexical Conventions Tokens • Comments Identifiers Keywords • Literals Implementation dependencies

Basic Concepts

Declarations and Definitions Scopes, Program and Linkage Start and Termination Storage Class Types • Lvalues Name Spaces Numerical Limits

Standard Conventions

Integral Promotions Integral Conventions Float and Doubles Floating and Integral Arithmetic Conversions Reference Conversions Pointer to Members

Expressions of C++

Primary Expressions Postfix Expressions Unary Operators Explicit Type Conversion Pointer to Member Operators Multiplicative Operators Addictive Operators • Shift Operators Relational Operators Equality Operators, Bit wise Operators Logical Operators, Conditional Operators Assignment Operators, Comma Operator Constant Expressions

Statements

Labeled Statements Expression Statements Compound or Block Statement Selection Statements Iteration Statements Jump Statements Declaration Statements Ambiguity Resolutions

Declarations

Specifiers Enumeration Declarations Asm Declarations Linkage Specifications Type-Safe Linkage Limitations

Decelerators

Type Names meaning of Declarators Function Definitions Initializers • Pointers to Members

Classes

Class Names Class Members Member Functions Static Members Unions • Bit - Fields Nested Class Declarations Local Class Declarations

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Derived Classes

Multiple Base Classes Virtual Functions Abstract Classes Summary of Scope Rules Single Inheritance Multiple Inheritance Casting Multiple Inheritance & Implicit Conversion Virtual Base Classes Virtual Base Classes & Casting Single Inheritance & Virtual Functions Multiple Inheritance & Virtual Functions Instantiation of Virtual Functions Virtual Base Classes with Virtual Functions Renaming

Member Access Control

Access Specifiers Access Specifiers For Base Classes Friends Protected Member Access Access To Virtual Functions Multiple Access General Ideas Per Class Protection Access Control

Specific Member Functions

Constructors Temporary Objects Conversions, Initialization Constructors & Destructors Copying Class Objects Temporary Class Objects Temporary Elimination Access Control And Special Functions Summary Of Member, Friend & Special Functions

Overloading

Declaration Matching Argument Matching Address Of Overloaded Functions Overloaded Operator

Templates

Class Templates Type Equivalence Function Templates Declarations And Definitions Member Function Templates Friends Static Members And Variables

Exception Handling

Throwing And Exception Constructors And Destructors Handling An Exception Exception Specifications Special Functions Exceptions And Access

Preprocessing

Phases Of Preprocessing Trigraph Sequences Macro Definition And Expansion File Inclusion Condtional Compilation Line Control Error Directive Pragmas Null Directives Predefined Names C++ Constructs Verses #define Compatibility

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