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C C++ Training Content of HB Services

Introduction to "C" Language

- Data types
- Indentation
 - ✓ If else
- Operators
- The "WHILE" Loop
- The "For" Loop
- Nested Loop Statements
- The "BREAK" & "CONTINUE" Statement
 - ✓ Switch case default & break
- Bitwise operators

Functions

- Introduction to Functions
- Need for Functions
- Standard & User defined Functions
- What is header file
- How to create our own header file
- Difference between source file & exe file
- How to create exe file
- Defining & Calling Functions
- Storage Classes
 - ✓ Automatic Storage Classes
 - ✓ Register Storage Classes
 - ✓ Static Storage Classes
 - ✓ External Storage Classes
- Pass by Value, pass by Reference
- Return by value & return by address
- Recursive Functions

Pointers

- Memory concept
- Pointers to variable
- Pointers to pointers
- Pointers with operation



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Arrays

- Introduction to Arrays
- Need for Arrays
- Arrays with pointers
- Arrays with functions
- Types of Arrays
- One Dimensional Arrays
- Two Dimensional Arrays
- Multi Dimensional Arrays

Strings

- Char pointers
- Char array (String)
- Declaring & Initializing String Variables
- Strings with pointers
- Strings with functions
- String Functions
- Creation of our own string.h
- Array of Strings
- #define (preprocessing work)

Structures, Unions, Enum and typedef

- Enum and typedef
- Introduction to Structures
- Defining Structures
- Struct with pointers, arrays, strings and functions
- Array, Strings as Structures Members
- Containership
- Union, Different between Structure & Union

Graphics Programming

- In text Mode
- In Graphics Mode

File Operations

- Introduction to files
- Types of Files
- File Pointers
- Opening & Closing Files
- Modifying & deleting Files
- Interacting with
 - ✓ text files (ex: .txt, .c, .cpp)
 - ✓ non text files (ex: .dat, .mpg, .avi, .mp3)
 - ✓ data base files
- Creating database with file operation
- Command Line Arguments



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Dynamic Memory Allocation (DS)

- Purpose of dynamic memory allocation
- Malloc , calloc ,realloc and free
- Sorting
- Recursion
- Lists
- Single linked lists
- Double linked lists
- Circular linked lists
- Stacks
- Queues
- Adding 2 lists
- Inserting a node in required position
- Deleting a node from required position

Introduction to "C++" Programming

C++ Programming

- Oops
- Function Prototypes
- Comments
- Typecasting
- Void Pointers
- The :: operator
- The Const Qualifier
- Reference variables

Functions

- Function Prototypes
- Function Overloading
- Default Arguments in Functions
- Call by value, address & reference
- Return by value, by address & by reference
- Inline Functions

Classes in C++

- Member function
- Function Definition Outside The Class
- Classes and Constructors
- Destructors
- Copy Constructor
- The this Pointer
- New and delete Operators
- Using new and delete
- Malloc () / free () versus new/delete
- Classes, Objects and Memory
- Structures vs. Classes



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Miscellaneous Class Issues

- Static Class Data
- Static Member Functions
- Data Conversion
- Friend functions & friend Classes
- Data Conversion between Objects of Different Classes

Overloading operators

- Introduction
- Overloading assignment operator
- Overloading ++, --, +, -, *, /, <, > ?. & Logical operators
- Overloading operators between different objects
- Overloading << and >> (stream operators)

Inheritance

- Constructors in Inheritance
- Private Inheritance
- Protected Inheritance
- Functions That Are Not inherited
- Virtual Function
- Pure virtual functions
- Virtual Functions in Derived Classes
- Virtual Functions and Constructors
- Destructors and virtual Destructors
- Virtual Base Classes
- Abstract class
- Abstract base class

Advanced Features

- Classes Within Classes
- Friend Functions
- Friend Classes
- Overloading << and >>

Input / Output In C++ (File operations)

- Manipulators
- File I/O with Streams
- Opening and closing files
- Creating database with file Operation
- Binary I/O
- Elementary Database Management
- Interacting with
 - ✓ Text files (ex: .txt, .c, .cpp)
 - ✓ Non-text files (ex: .dat, .mpg, .avi, .mp3)
- Creating database with file operation



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New Advanced Features

- Templates
- Function templates
- Class templates
- Exception handling
- Namespaces
- RTTI (Runtime Type Information)
- STL (Standard Template library)
- Dynamic cast operator
- typeid operator
- typeid class

Data Structures with C++

- Sorting
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