CogniWeb
SOLUTIONS
Empowering the Next Generation of Developers with Future-ready Solutions

C++ LANGUAGE COMPLETE LEARNING PATH
(From Zero to Advanced-Level Mastery)

BASIC LEVEL (FUNDAMENTALS)

MODULE 1: INTRODUCTION TO C++ PROGRAMMING
- History (C vs C++)
- First C++ Program (cout, cin, namespace)
- C++ vs C syntax differences

MODULE 2: DATA TYPES AND VARIABLES
- Primitive types (int, double, bool)
- auto keyword, type inference
- const vs constexpr

MODULE 3: I/O OPERATIONS
- cout, cin, cerr
- Formatted I/O
- File I/O (fstream, ifstream, ofstream)

MODULE 4: FUNCTIONS
- Function overloading
- Default arguments
- Inline functions

MODULE 5: ARRAYS & STRINGS
- Array
- string class (vs C-style char arrays)

MODULE 6: OPERATORS & EXPRESSIONS
- Arithmetic, Logical, Bitwise
- new/delete vs malloc/free

MODULE 7: CONTROL FLOW
- Arithmetic, Logical, Bitwise
- new/delete vs malloc/free

MODULE 8: OOP CONCEPTS
- Classes & Objects
- Constructors/Destructors
- Inheritance (public, protected, private)
- Polymorphism (Virtual functions, overriding)
- Friend functions/classes

MODULE 9: OPERATOR OVERLOADING
- Overloading +, <<, ==, etc.

MODULE 10: TEMPLATES
- Function templates
- Class templates

MODULE 11: EXCEPTION HANDLING
- try, catch, throw
- Custom exception classes

ADVANCED LEVEL (EXPERT)

MODULE 1: LAMBDA FUNCTIONS
- Syntax ([],(),{})
- Captures ([=], [&])

MODULE 2: MOVE SEMANTICS & R-VALUE REFERENCES
- std::move
- Copy vs Move constructors

MODULE 3: MULTITHREADING
- Threads, Async
- Mutexes

MODULE 4: FILE & SYSTEM I/O
- Filesystem library (C++17)
- Memory-mapped files

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