



Introduction to C++

Starting with C++
How C++ evolved from C?
Features of C++
Procedure-oriented programming
OOP vs. procedure-oriented programming
The basic anatomy of a C++ program
Starting with a simple "Hello World" program
Compiling, linking and running a C++ program

Object-Oriented Programming Concepts

Abstraction
Inheritance
Polymorphism
Data Binding
Encapsulation
Classes, subclasses and Objects

The Basics of C++

Base Data Types and sizes
User-defined Data Types
Variable Declarations, Variable Names
Dynamic initialization of variables
Constants and its types

- Character Constants
- String Constants

Standard input and standard output

- Formatted input – cin
- Formatted output – cout
- Use of << and >> operators

Using Functions/Procedures

Why Functions?
Anatomy of a Function
Returning values from functions
Arguments Passed by Value
Passing Addresses of Arguments
Concept of variable scope and scope rules
Static and automatic variables
Global variables

Pointers and Arrays

Pointers

- What is a Pointer?
- Pointer Initialization
- Pointer Operators
- The & Operator
- Pointer Arithmetic
- Functions and pointers

Understanding Arrays

- Arrays
- Initializing Arrays
- Passing Arrays to Functions

Pointers and Arrays

Pointer to an Array

Array of pointers

Strings

Binding data and functions

Concept of a class
Defining a class
Creating an object
Object Scope
Data Abstraction
Enforcing Data Encapsulation
'this' Pointer ! Dynamic creation of objects
Constructors and Destructors

- The Default Constructor
- The Destructor

- Parameterized Constructors
- Copy constructor

Defining member functions

- Methods and access modifiers

Accessing class data and methods
Friend class and friendly functions
Returning objects
Arrays of Objects

Function and Operator Overloading

Function Overloading

- Using overloaded functions
- Rules for overloading

Operator overloading and its uses

- Overloading unary and binary operators
- Overloading the assignment operator
- Overloading the << Operator
- Overloading the increment and decrement operator

Dealing with strings using operators

Converting data types

- Basic to class type
- Class to basic type
- Class to another class type

Reusing classes

Inheritance-Base and Derived classes
Inheritance types
Scope Resolution operator
Access Modifiers
Access and Inheritance
Constructors and Inheritance
Multiple & Multilevel Inheritance
Calling base class constructor
Overriding base class members

Virtual functions and Polymorphism

Virtual & non-virtual Overriding
Virtual functions
Rules for virtual functions
Pure virtual functions
Static and Dynamic Binding
Virtual base classes

Templates, Exception Handling

Templates
Function templates
Class templates
Exception handling

IOS Stream and File Handling Object Persistence

Console I/O Operation Formatted & Unformatted,
IStream, FStream, SStream Classes,
Method Write (), Read (), Get (), Put (), E.t.c,

Miscellaneous Topics

Aggregation,
Association,
Types of Objects,
OOA & OOD,
UML,

