



C++ Programming Language

Last Updated : 12 May, 2025

C++ is a computer programming language developed by Bjarne Stroustrup as an extension of the C language. It is known for its fast speed, low level memory management and is often taught as first programming language. It provides:

- Hands-on application of different programming concepts.
- Similar syntax to C and other popular languages making it easier to switch.



Example Program

The below code shows the simplest C++ program that you can run to print some text on the console screen.

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Got It !

```
cout << "Hello World";  
return 0;  
}
```

Output

Hello World

This C++ tutorial is designed to provide a guide for easy and efficient learning of both core and advanced concepts of C++. Each concept is explained with simple illustrations and practical code examples that can be executed easily. This tutorial also provides quizzes in each section to test your understanding. **Let's start!**

C++ Fundamentals

This section guides you through the basic concepts of C++ programming. It covers topics that teaches you to write your first program, manage data, perform different operations and control the flow of the program.

- [Introduction](#)
- [Identifiers](#)
- [Keywords](#)
- [Variables](#)
- [Data Types](#)
- **Quiz:** [Basics](#) | [Variables and Data Types](#)
- [Operators](#)
- [Basic Input / Output](#)
- **Quiz:** [Operator](#) | [Input Output](#)
- [Conditional Statements](#)
- [Loops](#)
- **Quiz:** [Control Statements](#) | [Loops](#)

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functions to write a modular and reusable code.

- [Functions](#)
- [Parameter Passing Techniques](#)
- [Default Arguments](#)
- [Recursion](#)
- [Inline Functions](#)
- [Lambda Expression](#)
- **Quiz:** [Functions](#)

Compound Data Types

Compound data types are created from the built-in data types. This section guides you through important compound data types such as array, strings, pointer and structures that helps in managing complex real-world data.

- [Arrays](#)
- [Pointers](#)
- [References](#)
- **Quiz:** [Array](#) | [Pointer](#) | [Reference](#)
- [Strings](#)
- [Structures](#)
- [Unions](#)
- [Enumeration](#)
- **Quiz:** [Strings](#) | [Structure and Union](#)

Dynamic Memory Management

C++ allows the low-level memory manipulation using pointers and dynamic memory allocation/deallocation operators. This section guides you through the basis of dynamic memory management.

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- **Quiz:** [Dynamic Memory Management](#)

Object Oriented Programming (OOPs) in C++

This section covers key concepts of Object-Oriented Programming (OOPs) in C++ such as classes, objects, encapsulation, inheritance, polymorphism, and abstraction.

- [Object Oriented Programming \(OOPs\)](#)
- [Classes and Objects](#)
- [Encapsulation](#)
- [Polymorphism](#)
- [Inheritance](#)
- [Abstraction](#)
- **Quiz:** [OOPs Quiz](#)

C++ Standard Template Library (STL)

This section covers Standard Template Library (STL) which is an in-built library that provides a set of commonly used data structures such as vectors, lists, stacks, queues, maps, etc. and algorithms that enhance productivity and performance.

- [Templates](#)
- [Standard Template Library \(STL\)](#)
- [Algorithms](#)
- [Containers](#)
- [Iterators](#)
- [Vector](#)
- [Stack](#)
- [Queue](#)
- [Map](#)

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Exception handling are the techniques to handle runtime errors efficiently. This section covers how to handle exceptions to prevent crashes and improve the reliability of applications.

- [Exception Handling](#)
- [Exception Handling using Classes](#)
- [Stack Unwinding](#)
- [User-Defined Exceptions](#)
- **Quiz:** [Exception Handling Quiz](#)

File Handling in C++

File handling allows programs to store and retrieve data from files. This section introduces file handling in C++ using streams. It covers reading from and writing to files using streams.

- [Files and Streams](#)
- [I/O Redirection](#)
- **Quiz:** [File Handling Quiz](#)

Advanced C++

This section covers advanced concepts in C++ such as move preprocessor, multithreading, etc. Mastering these topics allows developers to write efficient, high-performance C++ applications.

- [Preprocessor](#)
- [Namespaces](#)
- [Smart Pointers](#)
- [Callbacks](#)
- [Multithreading](#)
- [Signal Handling](#)

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C++ Interview Questions

Quickly prepare yourself for C++ interviews with the help of our carefully curated list of commonly asked interview questions.

- [Top 50 C++ Interview Questions and Answers](#)
- [Top C++ STL Interview Questions and Answers](#)
- [30 OOPs Interview Questions and Answers](#)
- [Top C++ Exception Handling Interview Questions and Answers](#)

C++ vs Other Programming Languages

Let's see where C++ stands as compared to other programming language:

Feature	C++	C	Java	Python
Type	Compiled	Compiled	Compiled and Interpreted	Interpreted
Paradigm	Multi-paradigm (procedural, object-oriented, generic)	Procedural, structured	Object-oriented, structured	Procedural, object-oriented, functional
Memory Management	Manual	Manual	Automatic	Automatic

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Feature	C++	C	Java	Python
Use Cases	System programming, game development, high-performance applications	System programming, embedded systems, game development	Large-scale applications, enterprise software	Web development, data science, automation
Notable Frameworks/Libraries	Standard Library, Boost	Standard Library	Spring, Hibernate	Django, Flask, NumPy
Community Support	Strong	Strong	Strong	Strong
Job Market	Abundant	Abundant	Abundant	Abundant


The below program compares the basic program structure of C++ with other languages:




```
#include <stdio.h>
int main() {
    printf("Hello, World!");
    return 0;
}
```



```
#include <iostream>
int main() {
    std::cout << "Hello, World!";
    return 0;
}
```



```
public class Main{
    public static void main(String[] args) {
        System.out.print("Hello, World!");
    }
}
```



```
print("Hello, World!")
```

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