C++ Tutorial

- C++ is a popular programming language.

- C++ is used to create computer programs, and is one of the most used language in game development.

- C++ tutorial provides basic and advanced concepts of C++.

- Our C++ tutorial is designed for beginners and professionals.

- C++ is an object-oriented programming language. It is an extension to C programming.

- Our C++ tutorial includes all topics of C++ such as first example, control statements, objects and classes, inheritance, constructor, destructor, this, static, polymorphism, abstraction, abstract class, interface, namespace, encapsulation, arrays, strings, exception handling, File IO, etc.

What is C++

C++ is a general purpose, case-sensitive, free-form programming language that supports object-oriented, procedural and generic programming.

C++ is a middle-level language, as it encapsulates both high and low level language features.

Object-Oriented Programming (OOPs)

C++ supports the object-oriented programming, the four major pillar of object-oriented programming (OOPs) used in C++ are:

1. Inheritance
2. Polymorphism
3. Encapsulation
4. Abstraction

C++ Standard Libraries

Standard C++ programming is divided into three important parts:

- The core library includes the data types, variables and literals, etc.
- The standard library includes the set of functions manipulating strings, files, etc.
- The Standard Template Library (STL) includes the set of methods manipulating a data structure.

Usage of C++

By the help of C++ programming language, we can develop different types of secured and robust applications:

- Window application
- Client-Server application
- Device drivers
- Embedded firmware etc

C++ Program

In this tutorial, all C++ programs are given with C++ compiler so that you can easily change the C++ program code.

File: main.cpp

```
1.  #include <iostream>
2.  using namespace std;
3.  int main() {
4.     cout << "Hello C++ Programming";
5.     return 0;
6.  }
```

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- C++ Exception Handling   C++ try/catch   C++ User-Defined

C++ File & Stream

- C++ File & Stream

C++ Programs

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- Factorial   Armstrong Number   Sum of digits   Reverse Number
- Swap Number   Matrix Multiplication   Decimal to Binary   Number in Characters
- Alphabet Triangle   Number Triangle   Fibonacci Triangle

C++ STL Tutorial

- C++ STL Algorithm   algorithm adjacent_find() function
- algorithm any_of() function   algorithm copy() function
- algorithm copy_if() function   algorithm count() function
- algorithm count_if() function   algorithm equal() function
- algorithm find() function   algorithm find_end() function
- algorithm find_first_of() function   algorithm find_if() function

- algorithm find_if_not() function
- algorithm move() function
- algorithm copy_backward() function
- algorithm search() function
- algorithm mismatch() function
- algorithm none_of() function
- algorithm swap() function
- algorithm iter_swap() function
- algorithm replace_copy() function
- algorithm replace() function
- algorithm transform() function
- algorithm generate_n() function
- algorithm remove() function
- algorithm random_shuffle() function
- algorithm remove_copy() function
- algorithm partition_point() function
- algorithm remove_if() function
- algorithm reverse() function
- algorithm rotate() function
- algorithm stable_partition() function
- algorithm unique() function
- algorithm is_sorted() function
- algorithm nth_element() function
- algorithm partial_sort() function
- algorithm stable_sort() function
- algorithm equal_range() function
- algorithm inplace_merge() function
- algorithm set_union() function

algorithm for_each() function
algorithm all_of() function
algorithm copy_n() function
algorithm is_permutation() function
algorithm move_backward() function
algorithm search_n() function
algorithm fill() function
algorithm replace_copy_if() function
algorithm replace_if() function
algorithm swap_ranges() function
algorithm fill_n() function
algorithm generate() function
algorithm is_partitioned() function
algorithm remove_copy_if() function
algorithm partition_copy() function
algorithm partition() function
algorithm reverse_copy() function
algorithm rotate_copy() function
algorithm shuffle() function
algorithm unique_copy() function
algorithm is_sorted_until() function
algorithm lower_bound() function
algorithm partial_sort_copy() function
algorithm sort() function
algorithm binary_search() function
algorithm includes() function
algorithm merge() function
algorithm upper_bound() function

C++ STL Bitset

- C++ Bitset
- bitset count() function

bitset all() function
bitset flip() function

bitset any() function
bitset none() function

- bitset operator[]   bitset reset() function   bitset set() function
- bitset size() function   bitset test() function   bitset to_string() function
- bitset to_ullong() function   bitset to_ulong() function

C++ STL Deque

- C++ Deque   Deque assign() function   Deque emplace() function
- Deque emplace_back() function   Deque emplace_front() function
- Deque insert() function   Deque push_back() function
- Deque push_front() function   Deque pop_back() function
- Deque pop_front() function   Deque swap() function
- Deque clear() function   Deque empty() function
- Deque erase() function   Deque max_size() function
- Deque resize() function   Deque shrink_to_fit() function
- Deque size() function   Deque at() function
- Deque operator[]() function   Deque operator=() function
- Deque back() function   Deque begin() function
- Deque cbegin() function   Deque end() function
- Deque cend() function   Deque rbegin() function
- Deque crbegin() function
- Deque rend() function
- Deque crend() function

C++ STL List

- C++ List   List insert() function   List push_back() function
- List push_front() function   List pop_back() function
- List pop_front() function   List empty() function
- List size() function   List max_size() function
- List front() function   List back() function
- List swap() function   List reverse() function

- List sort() function   List merge() function   List splice() function
- List unique() function   List resize() function   List assign() function
- List emplace() function   List emplace_back() function
- List emplace_front() function

C++ STL Map

- C++ Map   map at() function   map begin() function
- map cbegin() function   map cend() function
- map crbegin() function   map crend() function
- map empty() function   map end() function
- map max_size() function   map operator[]
- map rbegin() function   map rend() function
- map size() function   map clear() function
- map emplace() function   map emplace_hint() function
- map erase() function   map find() function
- map insert() function   map operator=()
- map swap() function

C++ STL Math

- math cos() function   math sin() function   math tan() function
- math acos() function   math asin() function   math atan() function
- math atan2() function   math cosh() function   math sinh() function
- math tanh() function   math acosh() function   math asinh() function
- math atanh() function   math exp() function   math frexp() function
- math ldexp() function   math log() function   math log10() function
- math modf() function   math exp2() function   math expm1() function
- math log1p() function   math log2() function   math logb() function
- math scalbn() function   math scalbln() function   math ilogb() function
- math copysign() function   math nextafter() function   math nexttoward() function
- math fdim() function   math fmax() function   math fmin() function
- math pow() function   math sqrt() function   math cbrt() function
- math hypot() function   math ceil() function   math floor() function

- math round() function
- math lround() function
- math llround() function
- math fmod() function
- math trunc() function
- math rint() function
- math lrint() function
- math llrint() function
- math nearbyint() function
- math remainder() function
- math remquo() function
- math fabs() function
- math abs() function
- math fma() function
- math fpclassify() function
- math isfinite() function
- math isinf() function
- math isnan() function
- math isnormal() function
- math signbit() function
- math isgreater() function
- math isgreaterequal() function
- math less() function
- math islessequal() function
- math islessgreater() function
- math isunordered() function
- math erf() function
- math erfc() function
- math tgamma() function
- math lgamma() function

C++ STL priority_queue

- C++ priority_queue
- priority_queue emplace() function
- priority_queue empty() function
- priority_queue pop() function
- priority_queue push() function
- priority_queue size() function
- priority_queue swap() function
- priority_queue top() function

C++ STL Stack

- C++ Stack
- stack emplace() function
- stack empty() function
- stack pop() function
- stack push() function
- stack size() function
- stack top() function

C++ STL Queue

- C++ Queue
- queue back() function
- queue emplace() function
- queue empty() function
- queue front() function
- queue pop() function
- queue push() function
- queue size() function

C++ STL Multiset

- C++ multiset
- multiset constructor
- multiset destructor
- multiset begin() function
- multiset end() function
- multiset operator=
- multiset rbegin() function
- multiset rend() function
- multiset cbegin() function
- multiset cend() function
- multiset max_size() function
- multiset size() function

- multiset crbegin() function   multiset crend() function   multiset empty() function
- multiset insert() function   multiset clear() function   multiset emplace() function
- multiset erase() function   multiset swap() function   multiset emplace_hint() function
- multiset find() function   multiset key_comp() function   multiset value_comp() function
- multiset count() function   multiset equal_range() function
- multiset lower_bound() function   multiset upper_bound() function
- multiset get_allocator() function   multiset operator==   multiset operator!=
- multiset operator<   multiset operator<=   multiset operator>
- multiset operator>=   multiset swap() function

C++ STL Multimap

- C++ Multimap   multimap crbegin() function   multimap crend() function
- multimap begin() function   multimap cbegin() function   multimap cend() function
- multimap end() function   multimap rbegin() function   multimap rend() function
- multimap clear() function   multimap emplace() function   multimap empty() function
- multimap erase() function   multimap insert() function   multimap swap() function
- multimap equal_range() function   multimap operator==   multimap operator!=
- multimap operator<   multimap operator<=   multimap operator>
- multimap operator>=   multimap swap() function

C++ STL Set

- C++ Set   set constructor   set destructor
- set operator=() function   set begin() function   set cbegin() function
- set end() function   set cend() function   set rbegin() function
- set rend() function   set crbegin() function   set crend() function
- set empty() function   set Size() function   set max_size() function
- set insert() function   set erase() function   set Swap() function
- set clear() function   set emplace() function   set emplace_hint() function
- set key_comp() function   set value_comp() function   set find() function
- set count() function   set lower_bound() function   set upper_bound() function
- set equal_range() function   set get_allocator() function   set operator==
- set operator!=   set operator<   set operator<=

- set operator> set operator>= set swap() function

C++ STD Strings

- string compare() function string length() function string swap() function
- string substr() function string size() function string resize() function
- string replace() function string append() function string at() function
- string find() function string find_first_of() function string find_first_not_of() function
- string find_last_of() function string find_last_not_of() function string insert() function
- string max_size() function string push_back() function string pop_back() function
- sstring assign() function string copy() function string back() function
- string begin() function string capacity() function string cbegin() function
- string cend() function string clear() function string crbegin() function
- string data() function string empty() function string erase() function
- string front() function string operator+=() string operator=()
- string operator[]() string rfind() function string end() function
- string rend() function string shrink_to_fit() function string c_str() function
- string crend() function string rbegin() function string reserve() function
- string get_allocator() function

C++ STL Vector

- C++ Vector Vector at() function Vector back() function
- Vector front() function Vector swap() function Vector push_back() function
- Vector pop_back() function Vector empty() function Vector insert() function
- Vector erase() function Vector resize() function Vector clear() function
- Vector size() function Vector capacity() function Vector assign() function
- Vector operator=() function Vector operator[]() function Vector end() function
- Vector emplace() function Vector emplace_back() function Vector rend() function
- Vector rbegin() function Vector begin() function Vector max_size() function
- Vector cend() function Vector cbegin() function Vector crbegin() function
- Vector crend() function Vector data() function Vector shrink_to_fit() function

Interview Questions

o Interview Questions