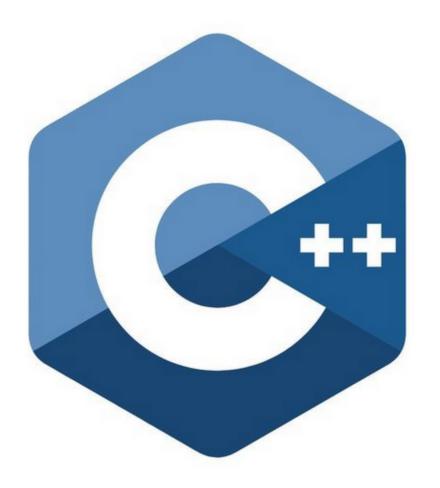


# C++ STL







## Standard Template Library (STL) in C++

The Standard Template Library (STL) is a powerful library in C++ that provides generic classes and functions. It includes useful components such as containers, iterators, algorithms, and function objects.

#### Introduction to STL

STL is a collection of template classes and functions that provide many common data structures and algorithms. Its main components are containers, iterators, algorithms, and function objects (functors).

#### Containers

Containers are data structures that store objects. STL provides several types of containers, each optimized for different kinds of operations.

@code.\_learning

- Vector: A dynamic array.
- List: A doubly linked list.
- Deque: A double-ended queue.
- Set: A collection of unique elements.
- Map: A collection of key-value pairs.

#### **Iterators**

Iterators are objects that point to elements within containers. They are used to traverse containers.

## Example of Iterators

```
#include <iostream>
#include <vector>

int main() {
    std::vector<int> v = {1, 2, 3, 4, 5};
    for (auto it = v.begin(); it ≠ v.end(); ++it) {
        std::cout << *it << " "; // Output: 1 2 3 4 5
    }
    return 0;
}</pre>
```

## Algorithms

Algorithms are a set of procedures that operate on containers through iterators. They perform tasks such as searching, sorting, counting, and manipulating elements.

## **Example of Algorithms:**

```
#include <iostream>
#include <vector>
#include <algorithm>

int main() {
    std::vector<int> v = {5, 1, 4, 2, 3};
    std::sort(v.begin(), v.end()); // Sort the vector
    for (int i : v) {
        std::cout << i << " "; // Output: 1 2 3 4 5
    }
    return 0;
}</pre>
```