C++ STL – Complete Function Directory (Final Edition)

This document is a complete reference of the C++ Standard Template Library (STL). All major containers, adapters, and algorithms are included in a strict table-based format with function name, description, and time complexity.

vector ()

Name	Details	Time Complexity
push_back(x)	Insert element at end	O(1) amortized
pop_back()	Remove last element	O(1)
insert(pos,x)	Insert at position	O(N)
erase(pos)	Erase element	O(N)
size()	Number of elements	O(1)
clear()	Remove all elements	O(N)
empty()	Check if empty	O(1)
front()	First element	O(1)
back()	Last element	O(1)

array ()

Name	Details	Time Complexity
size()	Number of elements	O(1)
fill(x)	Fill with value	O(N)
at(i)	Access with bounds check	O(1)
front()	First element	O(1)
back()	Last element	O(1)

list ()

Name	Details	Time Complexity
push_back(x)	Insert at end	O(1)

push_front(x)	Insert at front	O(1)
pop_back()	Remove last	O(1)
pop_front()	Remove first	O(1)
insert(pos,x)	Insert at position	O(1)
erase(pos)	Erase at position	O(1)

deque ()

Name	Details	Time Complexity
push_back(x)	Insert at end	O(1)
push_front(x)	Insert at front	O(1)
pop_back()	Remove last	O(1)
pop_front()	Remove first	O(1)
at(i)	Access element	O(1)

stack ()

Name	Details	Time Complexity
push(x)	Insert element	O(1)
pop()	Remove top	O(1)
top()	Access top	O(1)
empty()	Check empty	O(1)

queue ()

Name	Details	Time Complexity
push(x)	Insert element	O(1)
pop()	Remove front	O(1)
front()	Access front	O(1)
back()	Access back	O(1)

priority_queue ()

Name	Details	Time Complexity
push(x)	Insert element	O(log N)
pop()	Remove top	O(log N)
top()	Access top	O(1)
empty()	Check empty	O(1)

set / multiset ()

Name	Details	Time Complexity
insert(x)	Insert element	O(log N)
erase(x)	Erase element	O(log N)
find(x)	Find element	O(log N)
count(x)	Count occurrences	O(log N)

map / multimap ()

Name	Details	Time Complexity
m[key]	Insert or update	O(log N)
insert()	Insert pair	O(log N)
erase(key)	Erase by key	O(log N)
find(key)	Find element	O(log N)

unordered_map / unordered_set

Name	Details	Time Complexity
insert(x)	Insert element	O(1) average
erase(x)	Erase element	O(1) average
find(x)	Find element	O(1) average
count(x)	Check existence	O(1) average

Algorithms ()

Name	**Details**	**Time Complexity**
sort()	Sort range	O(N log N)
reverse()	Reverse range	O(N)
find()	Find element	O(N)
count()	Count occurrences	O(N)
binary_search()	Binary search	O(log N)
lower_bound()	First >= value	O(log N)
upper_bound()	First > value	O(log N)