Set Built-in Functions in C++ STL

1. Constructor

Name	Details	Time Complexity
set<type> s;	Construct an empty set.	O(1)
set<type> s(cmp);	Construct an empty set with a custom comparison function.	O(1)
set<type> s(it1, it2);	Construct a set with elements from the range [it1, it2).	O(N log N)
set<type> s(s2);	Construct a set by copying another set s2.	O(N)

2. Capacity

Name	Details	Time Complexity
s.size()	Returns the number of elements in the set.	O(1)
s.max_size()	Returns the maximum size the set can hold.	O(1)
s.empty()	Returns true if the set is empty, otherwise false.	O(1)

3. Modifiers

Name	Details	Time Complexity
s.insert(val)	Adds an element val to the set.	O(log N)
s.erase(val)	Removes the element val from the set.	O(log N)
s.erase(it)	Removes the element at iterator it.	O(1)
s.clear()	Clears all elements from the set.	O(N)
s.swap(s2)	Swaps contents with another set s2.	O(1)
s.emplace(args...)	Inserts a new element in place constructed with args.	O(log N)
s.insert(it1, it2)	Inserts elements from the range [it1, it2).	O(N log N)

4. Element Access

Name	Details	Time Complexity
s.find(val)	Finds an element with the value val.	O(log N)
s.count(val)	Counts elements with the value val. (0 or 1 for sets)	O(log N)
s.lower_bound(val)	Returns an iterator to the first element that is not less than val.	O(log N)

s.upper_bound(val)	Returns an iterator to the first element that is greater than val.	O(log N)
s.equal_range(val)	Returns a pair of iterators of the range that includes all the elements equivalent to val.	O(log N)

5. Iterators

Name	Details	Time Complexity
s.begin()	Returns an iterator to the first element.	O(1)
s.end()	Returns an iterator to the element following the last element.	O(1)
s.rbegin()	Returns a reverse iterator to the last element.	O(1)
s.rend()	Returns a reverse iterator to the element preceding the first element.	O(1)