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

Sorting is one of the most basic functions applied to data. It means arranging the data in a particular fashion, which can be increasing or decreasing. There is a builtin function in C++ STL by the name of sort().
Internally this function is implemented as Quick-sort. The complexity of it is O(N*log(N)).
The prototype for sort is :

```
sort(startaddress, endaddress)

startaddress: the address of the first element of the array
endaddress: the address of the next contiguous loca-
tion of the last element of the array.
So actually sort() sorts in the range of [startaddress,endad-
dress)
```

```cpp
#include <iostream>
#include <algorithm>

using namespace std;

void show(int a[])
{
    for(int i = 0; i < 10; ++i)
        cout << a[i] << " ";
}

int main()
{
    int a[10]= {1, 5, 8, 9, 6, 7, 3, 4, 2, 0};
    cout << "\n The array before sorting is : ";
    show(a);

    sort(a, a+10);

    cout << "\n\n The array after sorting is : ";
    show(a);

    return 0;

}
```

The outut of the above program is :

```
The array before sorting is : 1 5 8 9 6 7 3 4 2 0
The array after sorting is : 0 1 2 3 4 5 6 7 8 9
```

Refer std::sort() for more details.

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**Himangshu Kakati** • a year ago

the end address is not be the address of the array but the address of the next contiguous location of the last element

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**Jatin Agrawal** • a year ago

shouldn't end address be a+9 instead of a+10

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it's like [start, end). i.e the endpoint point one point forward.

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**Prasad K** • a year ago

Bit confused about this.. when sorting vector we use sort(first, end) where as for list we use listname.sort(). I thought STL template for sort for all containers was same. Why this differnece and why cant we sort list with first & last or vector entirely without giving parameters like list

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**hari haran** • 2 years ago

Which sorting algorithm does this sort() function use?

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**Sanyam** ➚ hari haran • 2 years ago

the short answer is that in most current standard libraries, std::sort is implemented as a intro-sort (introspective sort), which is basically a Quicksort that keeps track of its recursion depth, and will switch to a Heapsort (usually slower but guaranteed O(n log n) complexity) if the Quicksort is using too deep of recursion. Introsort was invented relatively recently though (late 1990's). Older standard libraries typically used a Quicksort instead.

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What is time complexity of the sort() function in stl.

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any answers??

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nlogn in c++, it uses quicksort and heap sort combo as said above in java sort method uses dual pivot quick sort.

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**Ankit Mishra** ➚ Amit kumar Yadav • 8 months ago

true

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**aj** • 2 years ago

can we implement this code in order to sort the number of letters increasingly?

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**Hodor** ➚ aj • a year ago

Definitely, you can make a compare function explicitly and call it like: sort(start, end, comparing_function). there are built ins available also, <greater> etc.

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**Arouna GANOU** ➚ aj • 2 years ago

what do you mean by "number of letters"?

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**harsh** • 2 years ago

sort(a, a+10); why?

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**Arvind S Panicker** ➚ harsh • 2 years ago

for an array just giving its name... for example int a[10] ,, a will denote its base address .. so starting address is passed as the base address of the array and then the size of the number of elements in the array is added to final element's address

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