An Introduction to Programming through C++
Professor Abhiram G. Ranade
Department of Computer Science and Engineering
Indian Institute of Technology Bombay
Lecture-23 Part-03
The Standard Library
Sorting vectors and arrays

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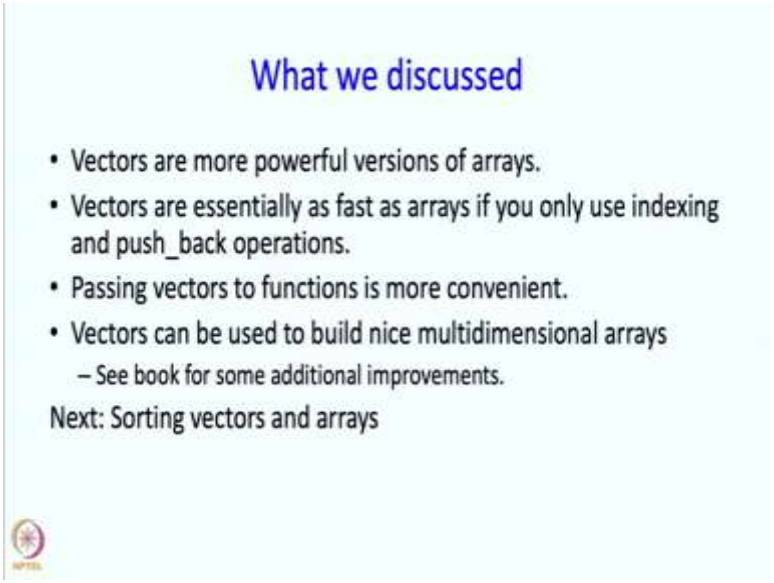

Welcome back. In the last segment we talk about vectors. In this segment we are going to talk about sorting. So, first how to sort a vector.

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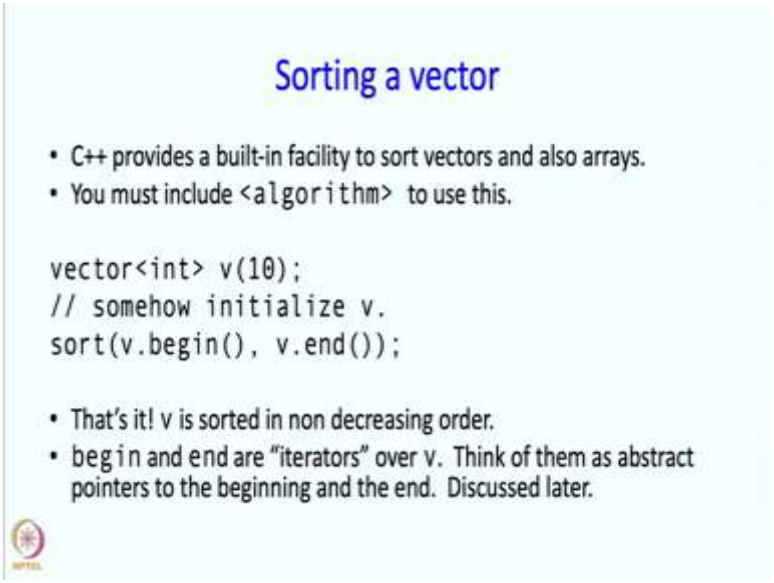

So, C++ provides a built-in facility to sort vectors and also arrays. And for this you need to include the header file algorithm. So once you do that suppose you have a vector V of 10 elements. Suppose, somehow you have put values into this vector, then you have to sort, if you want to sort you just do this, you write sort(V.begin(), V.end()), that is it. Alright!

So, I have not told you why V.begin() and V.end() are, think of this right now as mantras, but I am going to tell you what they mean shortly. This will sort V in non-decreasing order and begin and end are, what are called “iterators”, so iterators are kind of pointers, but they are abstract pointers and we are going to discuss them later.

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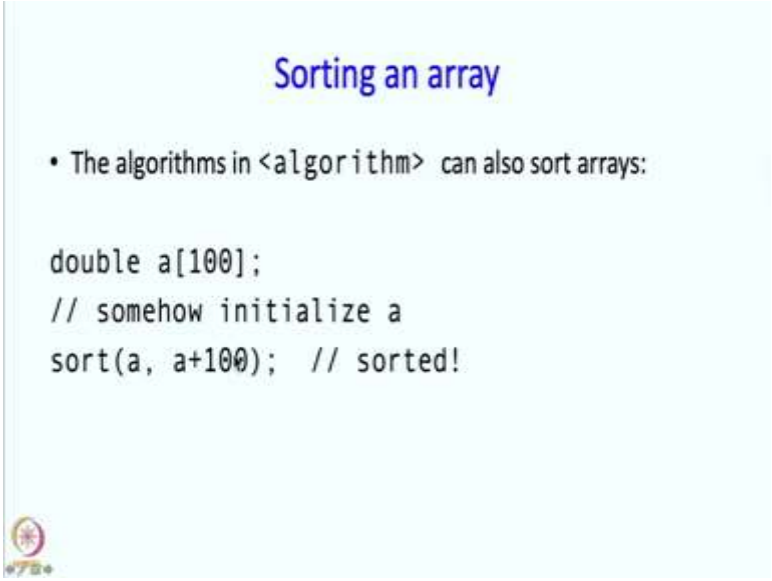

Sorting an array is quit similar, but not entirely. So again we need the header file algorithm. So suppose we have an array of 100 elements and somehow we initialized it, put values into it, and if I want to sort it, I just have a write sort(A, A+100) or here whatever the length it should appear over here that is it, then it is sorted.

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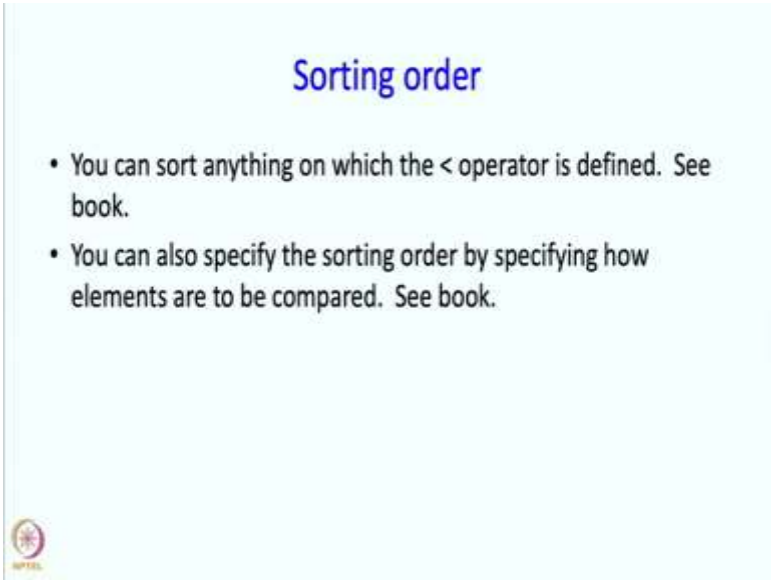

The sorting order can be decided. You do not have to always sort in non-decreasing order and, in fact, you can sort anything on which the less than operator is defined. So, for example, you can

sort strings. You have also create object or creates structs in which you write the less than operator. Once you write the less than operator you ready to sort.

This means, for example, I might have a struct which stores marks of various students and I can now choose to sort those structs say either by the physics marks or either chemistry marks whatever whatever I want, may be by the total marks, I just have to define the less than operator consistent with the order that I want.

And you do not even have to define the less than operator. In the sorting, in the sorting command itself you can specify the sorting order by giving a lambda expression. I am not going to talk about this in this lecture, but it is discuss quit extensively in the book and it is not hard and I will definitely encourage you to read it because there will be some exercises related to it.

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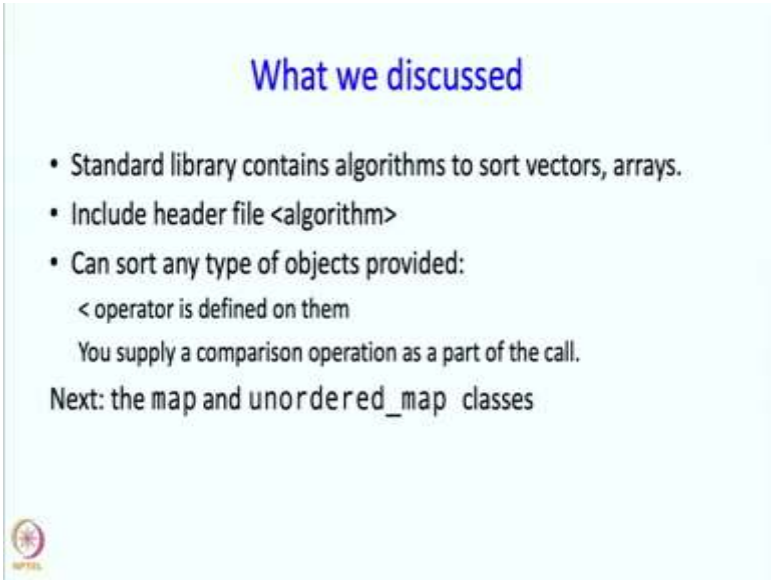

So, what have we discuss in this segment? So, standard library contains algorithms to sort vectors an arrays. For this you need to include header file algorithm and it can sort any type of objects provided less than operator is defined on those objects, or you supply a comparison operation as a part of the call. This concludes this segment and in the next segment I am going to discuss the classes map and unordered map, but let us take a quick break before that.