HEAPSORT
INTRO

What is HeapSort in C++?

C++ Heap Sort is a sorting method based on comparisons between the elements.

HeapSort Work

Heap sort makes use of max-heap or min-heap to sort the array. The first step in heap sort is to build a min or max heap from the array data and then delete the root element recursively and heapify the heap until there is only one node present in the heap.

Heapsort is a sorting technique based on comparison and uses binary heap.

HeapSort Technique

Binary Heap

A binary heap is represented using a complete binary tree. A complete binary tree is a binary tree in which all the nodes at each level are completely filled except for the leaf nodes and the nodes are as far as left.

A binary heap or simply a heap is a complete binary tree where the items or nodes are stored in a way such that the root node is greater than its two child nodes. This is also called max heap.

Heap Sort Algorithm for sorting in increasing order

01

Build a max heap from the input data.

02

At this point, the largest item is stored at the root of the heap. Replace it with the last item of the heap followed by reducing the size of heap by 1. Finally, heapify the root of tree.

03

Repeat above steps while size of heap is greater than 1.

What is HeapSort?

Heapsort is an efficient algorithm and it performs faster than selection sort. It may be used to sort an almost sorted array or find k largest or smallest elements in the array.

It can be termed as an improvement over selection sort since both these sorting techniques work with similar logic of finding the largest or smallest element in the array repeatedly and then placing it into the sorted array..

Heap Sort
Experiment

10	100	1000	10000	100000	10000000
3e-06	5.24e-05	0.0008008	0,0109102	0,139093	1,02113
3.1e-06	5.18e-05	0.0008038	0,0109988	0,137686	
5.1e-06	5.39e-05	0.0007924	0,0109359	0,13732	
3e-06	5.39e-05	0.0008125	0,0108951	0,136459	
3.1e-06	5.27e-05	0.0007888	0,0109649	0,13621	