

Insertion Sorting/ Online Sorting

upprever you have incoming stream of data and regularly dotor coming in and you want to keep that data in sorted order here Insertion sort becames very handy.

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arrange the chat Based on students name

Algorithm that being used

insertion sort

definition: Insertion Sort builds the sorted part of the list by repeatedly picking elements from the unsorted part and inserting them in the correct position within the sorted part.

It is much less efficient on large list than more advanced algorithm such as quicksort, heapsort, merge soft, However it provide several advantages like:

3. Simple implementation

@ Efficient for small data sets or mearly sorted.

{6, 4, 2, 6, 9} ex? I Try to find any No ain the left who is bigger than Pr Remain same { 6, 7, 2, 6,9 } is Any No. bigger than 2 in sorted par {6,2,7,6,9} Again is there any bigger than 2 in sorted. I yes {2,6,7,6,9}
Check who is bigger than 6 in Sorted {2,6,6,7,9} Chell who is bigger than 9 in Sorted -> NO { 2,6,6,7,9}

Here we keep trying to inserting the element so that the array set sorted in spacific order

> Insertion / online sorting follow => Stable sorting

CXX)

$$\begin{cases} 10, 15, 9, 8, 6 \\ 10, 15, 9, 8, 6 \end{cases} \rightarrow \text{Check bigger than } 9 \rightarrow \text{Yes} \\ \begin{bmatrix} 10, 15, 9, 8, 6 \\ 5 \end{bmatrix} \rightarrow \text{Check bigger than } 9 \rightarrow \text{Yes} \\ \end{bmatrix} \begin{cases} 9, 10, 15, 8, 6 \\ 5 \end{cases} \rightarrow \text{Check bigger than } 9 \rightarrow \text{Yes} \\ \end{bmatrix} \begin{cases} 8, 9, 10, 15, 6 \\ 5 \end{cases} \rightarrow \text{Check bigger than } 9 \rightarrow \text{Yes} \\ \end{bmatrix} \begin{cases} 8, 9, 10, 15, 6 \\ 5 \end{cases} \rightarrow \text{Check bigger than } 9 \rightarrow \text{Yes} \\ \end{bmatrix}$$

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3. Online Sorting / insertion sort

```
def insertion_sort(arr):
    for i in range(1, len(arr)):
        v = arr[i]
        j = i
        while (j>= 1 and arr[j-1]> v):
        arr[j] = arr[j-1]
        j -= 1
        arr[j]=v
```