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## Stability in sorting algorithms

A sorting algorithm is said to be stable if two objects with equal keys appear in the same order in sorted output as they appear in the input unsorted array. Some sorting algorithms are stable by nature like Insertion sort, Merge Sort, Bubble Sort, etc. And some sorting algorithms are not, like Heap Sort, Quick Sort, etc.

However, any given sorting algo which is not stable can be modified to be stable. There can be sorting algo specific ways to make it stable, but in general, any comparison based sorting algorithm which is not stable by nature can be modified to be stable by changing the key comparison operation so that the comparison of two keys considers position as a factor for objects with equal keys.

References:

<http://www.math.uic.edu/~leon/cs-mcs401-s08/handouts/stability.pdf>

[http://en.wikipedia.org/wiki/Sorting\\_algorithm#Stability](http://en.wikipedia.org/wiki/Sorting_algorithm#Stability)

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**Poorna Durga Yeddu** • 2 years ago

Is there any advantage in implementing unstable sort into stable sort as it is taking more number of key comparisons to implement it?

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**Shruthi.B.S** → Poorna Durga Yeddu • a year ago

Say you have a list with each item having information about destination of the flight and departure time. You first sort the list based on time. We then sort it based on destination. If the second sort is stable we now have all flights bound to same destination together and in increasing order of departure time. If it wasn't stable, they wouldn't be in increasing order of time.

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**gvk** • 4 years ago

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**Sandeep** → gvk • 4 years ago

@gvk: Thanks for pointing this out. There was a typo in link. The link has been corrected.

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