

Algorithm	Ease of Implementation	Best Time Complexity	Average Time Complexity	Worst Time Complexity	Small Data Efficiency	Large Data Efficiency	Adaptive	Stable	In-place	Online Sorting	Space Complexity
Bubble Sort	Very Easy	$O(n)$	$O(n^2)$	$O(n^2)$	No	No	No	Yes	Yes	Yes	$O(1)$
Insertion Sort	Easy	$O(n)$	$O(n^2)$	$O(n^2)$	Yes	No	Yes	Yes	Yes	Yes	$O(1)$
Selection Sort	Easy	$O(n^2)$	$O(n^2)$	$O(n^2)$	No	No	No	No	Yes	No	$O(1)$
Merge Sort	Moderate	$O(n \log n)$	$O(n \log n)$	$O(n \log n)$	Yes	Yes	No	Yes	No	No	$O(n)$
Quick Sort	Moderate	$O(n \log n)$	$O(n \log n)$	$O(n^2)$	Yes	No	No	No	Yes	No	$O(\log n)$
Heap Sort	Moderate	$O(n \log n)$	$O(n \log n)$	$O(n \log n)$	Yes	Yes	No	No	Yes	No	$O(1)$
Tim Sort	Complex	$O(n)$	$O(n \log n)$	$O(n \log n)$	Yes	Yes	Yes	Yes	No	No	$O(n)$
Tree Sort	Moderate	$O(n \log n)$	$O(n \log n)$	$O(n^2)$	Yes	No	No	Yes	No	No	$O(n)$
Counting Sort	Easy	$O(n + k)$	$O(n + k)$	$O(n + k)$	Yes	Yes	Yes	Yes	No	Yes	$O(k)$

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Bucket Sort	Moderate	$O(n + k)$	$O(n^2)$ or $O(n + k)$ (depends on distribution)	$O(n^2)$	Yes	No	No	Yes	No	Yes	$O(n + k)$
Radix Sort	Moderate	$O(nk)$	$O(nk)$	$O(nk)$	Yes	Yes	No	Yes	No	Yes	$O(n + k)$