



10. Shell Sort

- **Time Complexity:**
 - Best Case: $O(n \log n)$
 - Worst Case: $O(n^2)$
 - Average Case: Depends on the gap sequence, typically $O(n^{3/2})$
- **Space Complexity:** $O(1)$ (In-place)

Summary Table

Algorithm	Best Case	Average Case	Worst Case	Space Complexity
Bubble Sort	$O(n)$	$O(n^2)$	$O(n^2)$	$O(1)$
Selection Sort	$O(n^2)$	$O(n^2)$	$O(n^2)$	$O(1)$
Insertion Sort	$O(n)$	$O(n^2)$	$O(n^2)$	$O(1)$
Merge Sort	$O(n \log n)$	$O(n \log n)$	$O(n \log n)$	$O(n)$
Quick Sort	$O(n \log n)$	$O(n \log n)$	$O(n^2)$	$O(\log n)$
Heap Sort	$O(n \log n)$	$O(n \log n)$	$O(n \log n)$	$O(1)$
Counting Sort	$O(n + k)$	$O(n + k)$	$O(n + k)$	$O(k)$
Radix Sort	$O(d(n + k))$	$O(d(n + k))$	$O(d(n + k))$	$O(n + k)$
Bucket Sort	$O(n + k)$	$O(n + k)$	$O(n^2)$	$O(n + k)$
Shell Sort	$O(n \log n)$	$O(n^{3/2})$	$O(n^2)$	$O(1)$

Let me know if you'd like a deeper explanation of any algorithm!



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