1. Bubble Sort

Working:

- Compares adjacent elements and swaps them if they are in the wrong order.
- Repeats this process until the array is sorted.
- The largest elements "bubble" to the end of the array.

Time Complexity:

- Best case (already sorted): **$O(n)$**
- Worst/Average case: **$O(n^2)$**

2. Selection Sort

Working:

- Finds the smallest element in the array and swaps it with the first element.
- Finds the next smallest and swaps it with the second element.
- Repeats until the array is sorted.

Time Complexity:

- Best/Worst/Average case: $O(n^2)$

3. Insertion Sort

Working:

- Builds a sorted subarray by picking elements one by one and inserting them into their correct position.
- Similar to sorting playing cards in your hand.

Time Complexity:

- Best case (already sorted): $O(n)$
- Worst/Average case: $O(n^2)$

Algorithm	Best Case	Worst Case	Swaps	Stable?	Suitable for Large Arrays?
Bubble Sort	$O(n)$	$O(n^2)$	High	✅ Yes	❌ No
Selection Sort	$O(n^2)$	$O(n^2)$	Low	❌ No	❌ No
Insertion Sort	$O(n)$	$O(n^2)$	Medium	✅ Yes	❌ No