Selection Sort

Selection Sort : select an element & put it on its correct index.

Example:

4, ⑤, 1, 2, ③ → swap   [get the greatest element of the array & put it on its correct index]
0 1 2 3 4

④, 3, 1, ②, ⑤ → swap

2, ③, ①, ⑤ → swap [4, 5]

②, ①, ⑤ [3, 4, 5] → swap

[1, 2, 3, 4, 5] → Sorted !!

→ Here we selected maximum element & put it on right index, we can also do vice versa i.e, select minimum element and put it on right index !!

Complexity :

Total comparisons ⇒   4, 5, 1, 2, 3 $(n-1)$

                      4, 3, 1, 2, [5] $(n-2)$

already at
correct position   2, 3, 1, [4, 5] $(n-3)$
ignore in future
steps.   2, 1, [3, 4, 5]   1

                      [1, 2, 3, 4, 5]   0

$$= 0 + 1 + 2 + 3 + \dots (n-1) = \frac{n(n-1)}{2} = \boxed{\frac{n^2-n}{2}}$$

↑ neglect le
dominating &
constant te

Worst Case → $O(n^2)$
Best Case → $O(n^2)$

⇒ It is not stable sorting algorithm.
⇒ It performs well on small lists.