DSA

Data Structure & Algorithm

Selection Sorting
Vs
Bubble Sorting

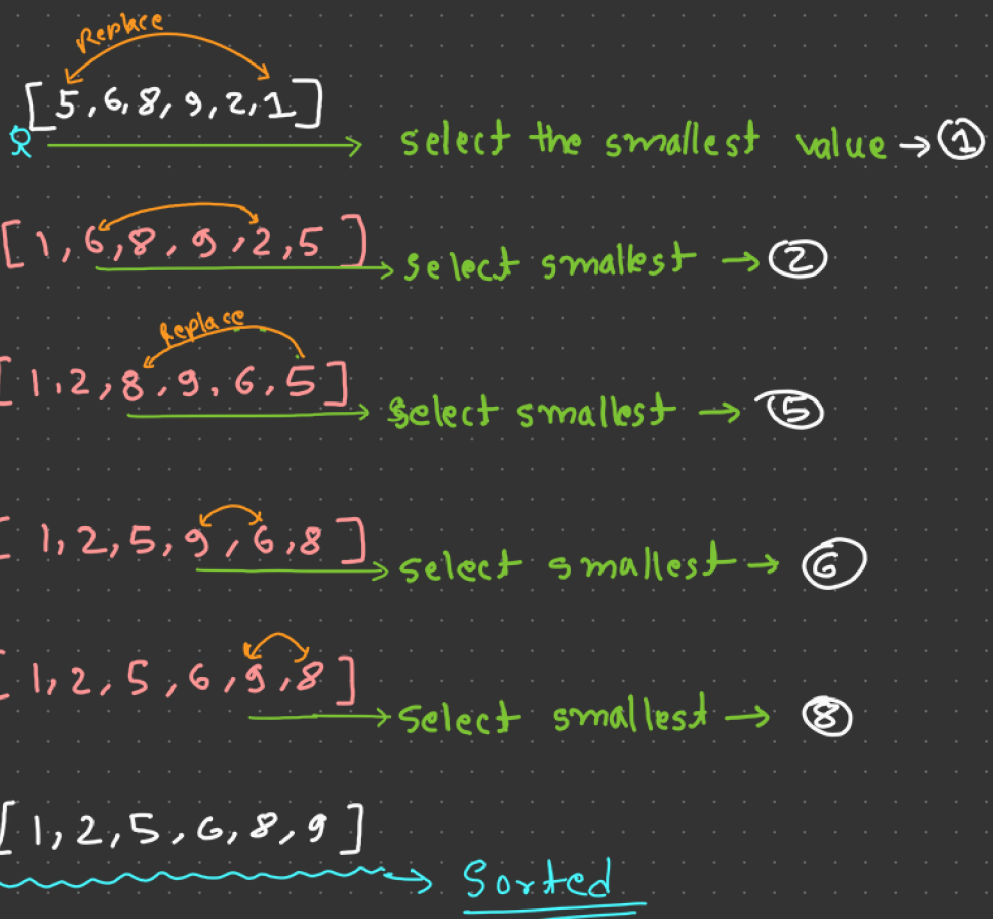
SWIPE

@KRISHAN KUMAR

Selection sorting

Think of arranging books on a shelf. You find the smallest book and put it first. Then, find the next smallest and put it next. Repeat until all books are in order.

Let,



in this example we find → smallest
we also find the largest value as value with selection sort technique

ex. 2

[3, 1, 5, 4, 2] — Replace → Select largest value → (5)

↳ [3, 1, 2, 4, 5] Select largest → (4)

↳ [3, 1, 2, 4, 5] Replace → Select largest → (3)

↳ [2, 1, 3, 4, 5] Select largest → (2)

↳ [1, 2, 3, 4, 5] → Sorted

Selection Sort which technique follow stable OR Unstable sort

ex → [3, 5, 2, 5', 1] Select largest → (5)

↳ [3, 1, 2, 5', 5] " → (5')

↳ [3, 1, 2, 5', 5] " → (3)

↳ [2, 1, 3, 5', 5] " → (2)

↳ [1, 2, 3, 5', 5] → Before sorting → 5 Before 5'

After sorting → 5' Before 5

Selection sorting follow Unstable sort ← change happen

Code for the selection sort

```python
# Selection sorting

def selection_sort(arr):
    for i in range(len(arr)):          ## iterating through range
        min = i
        for j in range(i+1, len(arr)):     ## finding the min values
            if arr[j] < arr[min]:

                min = j

        # find the smallest value
        arr[i], arr[min] = arr[min], arr[i]
```

Selection sort Vs Bubble sort

```python
# Selection sorting

def selection_sort(arr):
    for i in range(len(arr)):          ## iterating through range
        min = i
        for j in range(i+1, len(arr)):     ## finding the min values
            if arr[j] < arr[min]:

                min = j

        # find the smallest value
        arr[i], arr[min] = arr[min], arr[i]
```

V/s

```python
# bubble sorting

def bubbleSot(arr):
    for i in range(len(arr)-1, 0,-1):
        for j in range(i):
            if (arr[j]>arr[j+1]):
                arr[j], arr[j+1] = arr[j+1], arr[j]
```

1. $T(c) \Rightarrow O(n^2)$ — $T(c) = O(n^2)$
2. No. of Comparision $\Rightarrow 2n^2$ — Comparision $\hookrightarrow 2n^2$
3. No. of swapping $\rightarrow n$ time — Swapping $\hookrightarrow 2n^2$
4. Stability $\rightarrow$ Unstable — Stability $\hookrightarrow$ Stable

selection sort better Performance than bubble sort because, selection sort having less swapping Compare to bubble sort.