

D. S

- ① Graph
- ② Sorting

Sorting

It is a way to arrange element
on Asc. & Desc order (specific
order)

Stable Sorting

① If two element with the same value are in specific order in the original unsorted list

* Stable sorting maintain order in sorted list

Example - merge sort, Insertion sort, Bubble sort.

Unstable order

It may change the relative order of equal element during sorting

Ex: Quick Sort, Heap Sort

① Bubble Sort :-

It is a type of sorting which compare adjacent element and swap them until they are in unsorted order.

Bubble Sort

Time Complexity

Best — $O(n)$

Worst — $O(n^2)$

Average — $O(n^2)$

Space complexity = $O(1)$

Selection Sort

It is a type of Sorting that Select the smallest element from unsorted in each iteration and place that element at the beginning of the unsorted list

Time Complexity

Best — $O(n^2)$

Worst — $O(n^2)$

Average — $O(n^2)$

Space complexity
 $O(1)$

Sorting

Quick Sort

- * It is based on Divide & Conquer
- * In which an Array is divided into Subarray by selecting a pivot element.

Time Complexity

Best $\div O(n \log n)$

Worst case $O(n^2)$

Average case $O(n \log n)$

Space complexity $O(\log n)$

Insertion Sort

It is a Sorting Algorithm. that place an unsorted element at the suitable place.

It also work on comparison

Just like a Playing card

Time Complexity

Best case — $O(n)$

Worst case — $O(n^2)$

Average case — $O(n^2)$

Space Complexity — $O(1)$

Merge Sort

It works on the principle of Divide & Conquer.

Time Complexity

Best $O(n \times \log n)$

Worst $O(n \times \log n)$

Average $O(n \times \log n)$

Space Complexity
 $O(n)$

Heap Sort

It works on visualizing element of the array as a special kind of complete binary tree.

Time complexity

Best
Worst
Average

$O(n \log n)$

Space complexity

$O(1)$