Exercise3\_DSA\_Theory\_Solution

1. Understand Sorting Algorithms :

Bubble Sort :

In Bubble Sort algorithm,

List is traversed from left and adjacent elements are compared and the higher one is placed at right side.

In this way, the largest element is moved to the rightmost end at first.

This process is then continued to find the second largest and place it and so on until the data is sorted.

Insertion Sort :

In Insertion Sort algorithm :

We have to start with second element of the array as first element in the array is assumed to be sorted.

We have to compare second element with the first element and check if the second element is smaller then swap them.

We have to move to the third element and compare it with the second element, then the first element and swap as necessary to put it in the correct position among the first three elements.

We have to continue this process, comparing each element with the ones before it and swapping as needed to place it in the correct position among the sorted elements.

We have to repeat until the entire array is sorted.

Quick Sort :

In Quick Sort algorithm :

QuickSort is a sorting algorithm based on the Divide and Conquer algorithm that picks an element as a pivot and partitions the given array around the picked pivot by placing the pivot in its correct position in the sorted array.

Merge Sort :

Merge sort is a sorting algorithm that follows the divide-and-conquer approach. It works by recursively dividing the input array into smaller subarrays and sorting those subarrays then merging them back together to obtain the sorted array

Bubble Sort : Best case(O(n^2)) Average case(O(n^2)) Worst case(O(n^2))

Quick Sort: Best case(O(nlogn)) Average case(O(nlogn)) Worst case(O(log(n^2))

Quick sort is preffered because time complexity is reduced in best and average case as compared to quick sort.