Design and Analysis of Algorithms

Lab - 2

Sorting

A sorting algorithm is used to arrange elements of an array/list in a specific order.

A. Write a C/C++ program for the implementation of Bubble Sort.
B. Write a C/C++ program for the implementation of Selection Sort.
C. Write a C/C++ program for the implementation of Insertion Sort.

Do the run time analysis and time complexity analysis with the different values of input size. Maintain the tabular data.

Suggestion:

Bubble sort is a sorting algorithm that compares two adjacent elements and swaps them until they are in the intended order.
In an iteration, compare two adjacent elements, say first and second element, if the first element is greater than the second element, then swap them, then compare second and third elements, and so on. In an iteration, the largest element bubbles out and reaches its correct position.
Repeat the iteration (for the number of iterations required).

Selection sort is a sorting algorithm that selects the smallest element from an unsorted list in each iteration and places that element at the beginning of the unsorted list.

The insertion sort algorithm iterates through an input array and picks one element per iteration, finds the place the element belongs in the array, and then places it there. It is similar to sorting of playing cards.