Design and Analysis of Algorithms

Lab - 1

Searching

Search algorithms are designed to check or retrieve an element from any data structure where that element is being stored. They search for a target (key) in the search space.

A. Write a C/C++ program for the implementation of Linear Search.
B. Write a C/C++ program for the implementation of Binary Search.

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

Suggestion:

The linear search algorithm iteratively searches all elements of the array.

Check each item in the set of elements until it matches the key (target) element till the end.

Binary search needs sorted order of items of the array.

Compare the key (target) element with the middle element of the array. If the middle element is greater than the key element, the search continues in the left sub-array, else if the middle element is less than the key element, the search continues in the right sub-array.

The process repeats till the key element is not equal to the middle element or the key element is not found at all.