Linear Search

Linear search is a sequential searching algorithm where we start from one end and check every element of the list until the desired element is found.

Linear Search Pseudocode:

```
procedure linear_search (list, value)
      for each item in the list
            if match item == value
                  return the item's location
            end if
      end for
end procedure
```

Complexities: Time Complexity: Best – O(1), Average – O(n/2), Worst – O(n)
Space Complexity: O(1)

Applications: For searching operations in smaller arrays (<100 items)

Source Code:

```
using System;
namespace LinearSearch
{
    class Program
    {
        static void Main(String[] args)
        {
            Input();
        }
        static void Input()
        {
            Console.Write("Enter Number of Items: ");
            int noOfItems = Convert.ToInt32(Console.ReadLine());
            int[] itemsList =  new int[noOfItems];
            Console.Write("Enter Items: ");
            for (int i = 0; i < noOfItems; i++)
            {
                itemsList[i] = Convert.ToInt32(Console.ReadLine());
            }
            Console.Write("Enter Search Item: ");
            int searchItem = Convert.ToInt32(Console.ReadLine());
            int result = LinearSearch(itemsList, searchItem);
            if (result != -1)
            {
                Console.WriteLine($"Item is found in {result+1} location");
            }
            else
            {
                Console.WriteLine("Item does not found");
            }
        }
        static int LinearSearch(int[] itemsList, int searchItem)
        {
            for (int i = 0; i < itemsList.Length; i++)
            {
                if (itemsList[i] == searchItem)
                {
                    return i;
                }
            }
            return -1;
        }
    }
}
```