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Lab Manual : **02**
Course Code : **CSE 207**
Course Title : **Data Structures**
Instructor : **Md. Manowarul Islam, Adjunct Faculty, Department of CSE**

Objective:

The objective of this lab is to provide a fundamental idea about the sorting elements of an array and searching elements in an array using C programming. At the end of the lab, students are able to know:

- How to sort elements of an array.
- How to search and find elements in an array.

Lab Task

1. Write a program in C to find a specific element in an array using binary search algorithm. If the searched element is found then delete that element from the array and print the updated array else print not found. Suppose the array is unsorted initially. Sort the array using selection sort algorithm before executing binary search operation.

Sample Input	Sample Output
Input array elements: 12,45,78,2,7,10.-7 Key: 12 Input array elements: 12,45,78,2,7,10.-7 Key: 34	Sorted array elements: -7,2,7,10,12,45,78 Key is found Updated array elements: -7,2,7,10,45,78 Not found

2. Write a program in C to find and print the smallest 3 elements from an unsorted array using selection sort. Use binary search or linear search to determine the index of the last element among the smallest 3 elements (Consider indexing from 0).

Sample Input	Sample Output
Input array elements: 12,45,78,2,7,10.-7	Smallest 3 elements: -7,2,7, Index of last element among the smallest 3 elements is: 4.

3. Write a program in C to find a specific element using linear search in an array. If found then swap the element with the first element of the array. If not found then insert that specific key element in the middle index of that array. Print the modified array.

Sample Input	Sample Output
Input array elements: 13,1,79,22,7,12,24 Key: 79 Input array elements: 13,1,79,22,7,12,24 Key: 80	Key is found Array elements are: 79,1,13,22,7,12,24 Not found Array elements are: 13,1,79,80,22,7,12,24

4. Write a program in C to Modify the bubble sort algorithm to sort the array in descending order rather than ascending order.

Sample Input	Sample Output
Input array elements: 13,1,79,22,7,12,24	Array elements are: 79,24,22,13,12,7,1