BÀI TẬP THỰC HÀNH CẤU TRÚC DỮ LIỆU VÀ GIẢI THUẬT

LAB MANUAL

Academic Year : **2022 - 2023**

Semester : **I**

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S. No.	Experiment
1	**SEARCHING TECHNIQUES**
2	**SORTING TECHNIQUES**
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4	**IMPLEMENTATION OF STACK AND QUEUE**
5	**APPLICATIONS OF STACK**
6	**IMPLEMENTATION OF SINGLE LINKED LIST**
7	**IMPLEMENTATION OF DOUBLE LINKED LIST**
8	**IMPLEMENTATION OF STACK USING LINKED LIST**
9	**IMPLEMENTATION OF QUEUE USING LINKED LIST**
10	**IMPLEMENTATION OF BINARY SEARCH TREE**

WEEK - 2

SORTING TECHNIQUES

2.1 OBJECTIVE:

1. Write a C program for implementing Bubble sort techniques to arrange a list of integers in ascending order.
2. Write a C program for implementing insertion sort techniques to arrange a list of integers in ascending order.

2.2 PROGRAM LOGIC:

- **Bubble Sort Algorithm**

```
Algorithm  bubblesort ( x[],  n)
{ // x[1:n] is an array of n elements
    for i := 0 to  n do {
       for j := 0 to  n–i-1 do {
              if (x[j] > x[j+1]) {
                     temp = x[j];
                     x[j] = x[j+1];
                     x[j+1] = temp;
               }
        }
     }
 }
```

- **Insertion Sort Algorithm**

```
Algorithm insertionsort (a, n)
{//sort the array a[1:n] in ascending order
    for j:=2 to n do
    {
          item:=a[j];
          i=j-1;
       while((i>1) and (item< a[i])) do
       {
            a[i+1]:=a[i];
             i:=i-1;
       }
       a[i+1]:=item;
   }
}
```

2.3 IMPLEMENTATION:

- Implementation of Bubble Sort
  Output:

```
Enter elements into list:
1 4 2 3 5 7 2 11 23 45 231
The sorted list is [1, 2, 2, 3, 4, 5, 7, 11, 23, 45, 231]
```

- Implementation of Insertion Sort

2. 4 LAB ASSIGNMENT:

1. Formulate a program that implement Bubble sort, to sort a given list of integers in descending order.
2. Compose a program that implement Insertion sort, to sort a given list of integers in descending order.
3. Formulate a program to sort N names using Bubble sort.
4. Write a program to sort N employee records based on their salary using insertion sort.
5. A class contains 50 students who acquired marks in 10 subjects write a program to display top 10 students roll numbers and marks in sorted order by using bubble sorting technique.

2.5 POST LAB QUESTIONS:

1. Write the time complexity of Bubble Sort?
2. Write the time complexity of Insertion Sort?