Lab No: 17   **Date: 2081/**

Title: Write a program to sort the user input data in ascending or descending order using Bubble sort

In Bubble sort like a bubble the smallest or largest data element is swap to the one end at each pass. Here, in each pass an element compare and then interchange with it's adjacent element if the elements are not in proper order. In other words, Bubble Sort is a simple sorting algorithm that works by repeatedly swapping adjacent elements if they are in the wrong order. It belongs to the class of comparison-based sorting algorithms. The basic idea of bubble sort is to repeatedly traverse the array and compare adjacent elements. If the two elements are in the wrong order, they are swapped. This process is repeated until the entire array is sorted.

IDE: Visual Studio Code

Langauage: C

Source code :

```c
#include <stdio.h>
#include <conio.h>

void bubbleSort(int arr[], int n)
{
    int pass = 1;
    for (int i = 0; i < n - 1; i++)
    {
        printf("\nPass %d: \n", pass++);
        for (int j = 0; j < n - i - 1; j++)
        {
            // To swap the value
            if (arr[j] > arr[j + 1])
            {
                int temp = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = temp;
            }
            for (int k = 0; k < n; k++)
            {
                printf("%d, ", arr[k]);
            }
            printf("\n");
        }
    }
}
int main()
{
    int n, i;
    printf("Enter the size of array: ");
    scanf("%d", &n);
    int arr[n];
```

```c
        printf("Enter the array data:\n"); // Taking input from user

        for (i = 0; i < n; i++)

        {

            scanf("%d", &arr[i]);

        }

        bubbleSort(arr, n);          // Calling bubble sort on array arr

        printf("Sorted array: "); // Printing the final result

        for (int i = 0; i < n; i++)

            printf("%d ", arr[i]);

        return 0;

}
```

Output:

```
PS C:\Users\Roshan\Desktop\Roshan saud DSA(2)> cd
Enter the size of array: 6
Enter the array data:
9
5
7
1
2
8

Pass 1:
5, 9, 7, 1, 2, 8,
5, 7, 9, 1, 2, 8,
5, 7, 1, 9, 2, 8,
5, 7, 1, 2, 9, 8,
5, 7, 1, 2, 8, 9,

Pass 2:
5, 7, 1, 2, 8, 9,
5, 1, 7, 2, 8, 9,
5, 1, 2, 7, 8, 9,
5, 1, 2, 7, 8, 9,

Pass 3:
1, 5, 2, 7, 8, 9,
1, 2, 5, 7, 8, 9,
1, 2, 5, 7, 8, 9,

Pass 4:
1, 2, 5, 7, 8, 9,
1, 2, 5, 7, 8, 9,

Pass 5:
1, 2, 5, 7, 8, 9,
Sorted array: 1 2 5 7 8 9
PS C:\Users\Roshan\Desktop\Roshan saud DSA(2)> █
```