Lab No: 18 **Date: 2081/**

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

Selection Sort is a comparison-based sorting algorithm that organizes an array by continuously identifying the smallest (or largest) element from the unsorted section and swapping it with the first unsorted element. Initially, the smallest element is located and swapped with the first securing its correct position. The process is then repeated by finding the next smallest element and placing it in the second position. This step-by-step approach continues until all elements are in their proper positions, resulting in a fully sorted array.

IDE: Visual Studio Code

Langauage: C

Source code :

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

void selectionSort(int arr[], int n)
{
    int least, p, i, j, k, temp, pass = 1;
    for (i = 0; i < n - 1; i++)
    {
        least = arr[i];
        p = i;
        printf("\nPass %d: \n", pass++);
        for (j = i + 1; j < n; j++)
        {
            if (arr[j] < arr[p])
            {
                least = arr[j];
                p = j;
            }
            printf("Least: %d\n", least);
            for (k = 0; k < n; k++)
            {
                printf("%d ", arr[k]);
            }
            printf("\n");
        }
        printf("\n");
        temp = arr[i];
        arr[i] = arr[p];
        arr[p] = temp;
    }
}

int main()
{
    int n, i;
    printf("Enter the size of array: ");
    scanf("%d", &n);
    int arr[n];
    printf("Enter the array data:\n"); // Taking input from user
    for (i = 0; i < n; i++)
    {
        scanf("%d", &arr[i]);
    }
    selectionSort(arr, n);    // Calling Selection 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: 5
Enter the array data:
7
34
4
2
5

Pass 1:
Least: 7
7 34 4 2 5
Least: 4
7 34 4 2 5
Least: 2
7 34 4 2 5
Least: 2
7 34 4 2 5

Pass 2:
Least: 4
2 34 4 7 5
Least: 4
2 34 4 7 5
Least: 4
2 34 4 7 5

Pass 3:
Least: 7
2 4 34 7 5
Least: 5
2 4 34 7 5

Pass 4:
Least: 7
2 4 5 7 34
Sorted array: 2 4 5 7 34
PS C:\Users\Roshan\Desktop\Roshan saud DSA(2)>
```