ACPCE Where Knowledge is Second Nature	***Jawahar Education Society's*** ***A. C. Patil College of Engineering*** ***DEPARTMENT OF HUMANITY & SCIENCE*** ***Academic Year 2022-23***
Subject: Data Structures	**Practical In-charge: Dr. Asra Sadaf**
Name: Chetan Ingale	**Batch: S1** **Roll No:17**
Practical No. 01	**Date of Performance: - 17-07-2023** / **Date of Submission: - 24-07-2023**
Title	Program to store the elements in 1-D array and perform the operations like searching, sorting, reversing the elements.
Course Outcome CSL301.1	To implement basic data structures such as arrays, linked lists, stacks and queues.

Assessment Methodology

Sr. No.	Parameters for Assessment	Marks Obtained	Remarks			
1	Practical Performance (04 Marks)		Excellent	Good	Average	Poor
2	Write-up Presentation (04 Marks)		Excellent	Good	Average	Poor
3	Write-up Viva (04 Marks)		Excellent	Good	Average	Poor
4	Submission (02 Marks)		Timely		Late	
5	Attendance (01 Marks)		Present		Absent	
Total Marks (15 Marks)						

Teachers Signature with date

Program:

```
#include <stdio.h>

void storeElements(int arr[], int n) {
    printf("Enter the elements:\n");
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
}

int searchElement(int arr[], int n, int target) {
    for (int i = 0; i < n; i++) {
        if (arr[i] == target) {
            return i;
        }
    }
    return -1;
}

void sortArray(int arr[], int n) {
    int temp;
    for (int i = 0; i < n - 1; i++) {
        for (int j = 0; j < n - i - 1; j++) {
            if (arr[j] > arr[j + 1]) {
                temp = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = temp;
            }
        }
    }
}

void reverseArray(int arr[], int n) {
    int temp, start = 0, end = n - 1;
    while (start < end) {
        temp = arr[start];
        arr[start] = arr[end];
        arr[end] = temp;
        start++;
        end--;
    }
}

void displayArray(int arr[], int n) {
    printf("Array: ");
    for (int i = 0; i < n; i++) {
        printf("%d ", arr[i]);
    }
    printf("\n");
}
```

Program:

```
int main() {
    int n, choice, target, index;
    printf("Enter the number of elements in the array: ");
    scanf("%d", &n);

    int arr[n];

    storeElements(arr, n);

    while (1) {
        printf("\nOperations:\n");
        printf("1. Search an element\n");
        printf("2. Sort the array\n");
        printf("3. Reverse the array\n");
        printf("4. Display the array\n");
        printf("5. Exit\n");

        printf("Enter your choice (1/2/3/4/5): ");
        scanf("%d", &choice);

        switch (choice) {
            case 1:
                printf("Enter the element to search: ");
                scanf("%d", &target);
                index = searchElement(arr, n, target);
                if (index != -1) {
                    printf("Element found at index %d\n", index + 1);
                } else {
                    printf("Element not found in the array.\n");
                }
                break;

            case 2:
                sortArray(arr, n);
                printf("Array sorted successfully.\n");
                break;

            case 3:
                reverseArray(arr, n);
                printf("Array reversed successfully.\n");
                break;

            case 4:
                displayArray(arr, n);
                break;

            case 5:
                printf("Exiting the program.\n");
                return 0;
```

Program:

```
            default:
                printf("Invalid choice. Please enter a valid option (1/2/3/4/5).\n");
        }
    }

    return 0;
}
```

Output:

```
Enter the number of elements in the array: 3
Enter the elements:
645
45
55

Operations:
1. Search an element
2. Sort the array
3. Reverse the array
4. Display the array
5. Exit
Enter your choice (1/2/3/4/5): 4
Array: 645 45 55

Operations:
1. Search an element
2. Sort the array
3. Reverse the array
4. Display the array
5. Exit
Enter your choice (1/2/3/4/5): 1
Enter the element to search: 45
Element found at index 2

Operations:
1. Search an element
2. Sort the array
3. Reverse the array
4. Display the array
5. Exit
Enter your choice (1/2/3/4/5): 2
Array sorted successfully.

Operations:
1. Search an element
2. Sort the array
3. Reverse the array
4. Display the array
5. Exit
```

Output:

```
Enter your choice (1/2/3/4/5): 4
Array: 45 55 645

Operations:
1. Search an element
2. Sort the array
3. Reverse the array
4. Display the array
5. Exit
Enter your choice (1/2/3/4/5): 3
Array reversed successfully.

Operations:
1. Search an element
2. Sort the array
3. Reverse the array
4. Display the array
5. Exit
Enter your choice (1/2/3/4/5): 4
Array: 645 55 45

Operations:
1. Search an element
2. Sort the array
3. Reverse the array
4. Display the array
5. Exit
Enter your choice (1/2/3/4/5): 5
Exiting the program.
```

Signature of faculty with date