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Course Name: C.S.E. (IoT CS BC)

Course code: CSL301

Year: S.E.

Semester: 3

Roll No.: 17

Experiment Evaluation Sheet

Experiment No.: 1

Experiment Name:

Program to store the elements in 1-D array and perform the operations like searching, sorting, reversing the elements.

Sr No.	Evaluation Criteria	Marks (Out of 9)	Performance Date	Correction Date and Signature of Instructor
1	Experiment Performance			
2	Journal Performance			
3	Punctuality			
Total				

Code :

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

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

Code :

```
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. Exit\n");

        printf("Enter your choice (1/2/3/4): ");
        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:
                printf("Exiting the program.\n");
                return 0;

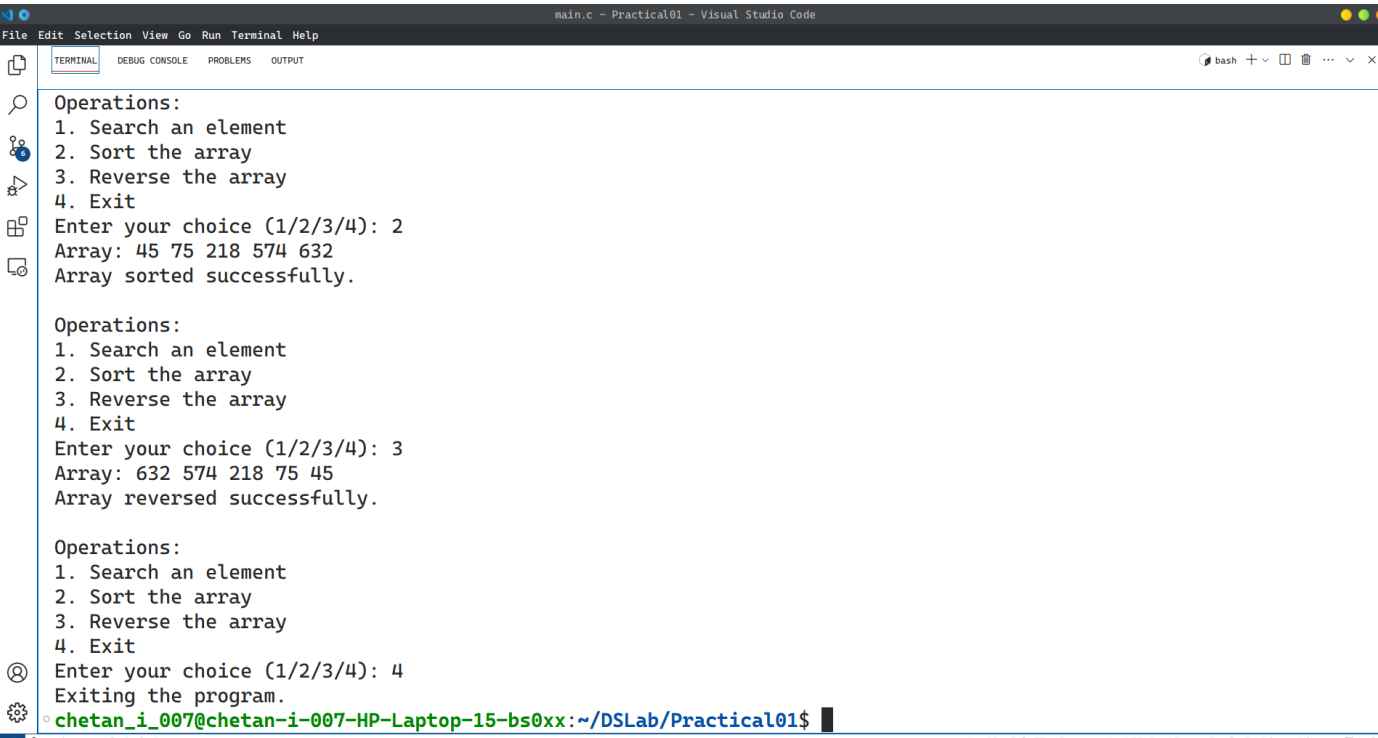
            default:
                printf("Invalid choice. Please enter a valid option (1/2/3/4).\n");
        }
    }

    return 0;
}
```

Output :

The screenshot shows the Visual Studio Code interface with a terminal window open. The title bar at the top reads "main.c - Practical01 - Visual Studio Code". The menu bar includes File, Edit, Selection, View, Go, Run, Terminal, and Help. The terminal has tabs for TERMINAL, DEBUG CONSOLE, PROBLEMS, and OUTPUT. The active tab is TERMINAL, which displays the following text:

```
•chetan_i_007@chetan-i-007-HP-Laptop-15-bs0xx:~/DSLab/Practical01$ ./main  
Enter the number of elements in the array: 5  
Enter the elements:  
45 632 75 218 574  
  
Operations:  
1. Search an element  
2. Sort the array  
3. Reverse the array  
4. Exit  
Enter your choice (1/2/3/4): 1  
Enter the element to search: 45  
Element found at index 1  
  
Operations:  
1. Search an element  
2. Sort the array  
3. Reverse the array  
4. Exit  
Enter your choice (1/2/3/4): 1  
Enter the element to search: 997  
Element not found in the array.  
  
Operations:  
1. Search an element  
2. Sort the array
```


At the bottom of the screen, there is a status bar showing "Ln 99, Col 77", "Spaces: 4", "UTF-8", "LF", and icons for C, Go Live, Linux, and other tools.

The screenshot shows a Visual Studio Code editor with a terminal window open. The terminal displays the output of a C program named 'main.c'. The program prompts the user to perform operations on an array of numbers. The user enters '2' to sort the array, and the program outputs the sorted array: 45 75 218 574 632. The user then enters '3' to reverse the array, and the program outputs the reversed array: 632 574 218 75 45. Finally, the user enters '4' to exit the program, and the program outputs 'Exiting the program.'.

```

main.c - Practical01 - Visual Studio Code
File Edit Selection View Go Run Terminal Help
TERMINAL
DEBUG CONSOLE PROBLEMS OUTPUT
bash + - + - - - - - x

Operations:
1. Search an element
2. Sort the array
3. Reverse the array
4. Exit
Enter your choice (1/2/3/4): 2
Array: 45 75 218 574 632
Array sorted successfully.

Operations:
1. Search an element
2. Sort the array
3. Reverse the array
4. Exit
Enter your choice (1/2/3/4): 3
Array: 632 574 218 75 45
Array reversed successfully.

Operations:
1. Search an element
2. Sort the array
3. Reverse the array
4. Exit
Enter your choice (1/2/3/4): 4
Exiting the program.
chetan_i_007@chetan-i-007-HP-Laptop-15-bs0xx:~/DSLAb/Practical01$
Ln 99, Col 77 Spaces: 4 UTF-8 LF C @ Go Live Linux
```

Conclusion :

Through this experiment we have learnt about how to implement an array using the C language. Various operations like searching, sorting, and reversing are applied on the array. This experiment helps us in using arrays as a data structure for further reference.