Experiment 1.1

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Semester: 3 **Date of Performance: 20/08/2022**
Subject Name: Data Structures **Subject Code: 21CSH-241**

1. Aim/Overview of the practical:

Write a menu driven program that implement following operations (using separate functions) on a linear array:
1) Insert a new element at end as well as at a given position.
2) Delete an element from a given whose value is given or whose position is given.
3) To find the location of a given element.
4) To display the elements of the linear array.

2. Source Code:

```
#include<stdio.h>

#include<stdlib.h>

int a[10], pos, elem;

int n = 0;

void create();

void display();

void insert();

void del();

void main()
```

```
{
        int choice;
        while(1)
        {
         printf("\n\n~~~~MENU~~~~");
        printf("\n=>1. Create an array of N integers");
        printf("\n=>2. Display of array elements");
        printf("\n=>3. Insert ELEM at a given POS");
       printf("\n=>4. Delete an element at a given POS");
       printf("\n=>5. Exit");
       printf("\nEnter your choice: ");
       scanf("%d", &choice);
       switch(choice)
       {
         case 1: create();
              break;
        case 2: display();
              break;
       case 3: insert();
              break;
       case 4:del();
              break;
```

```
        case 5:exit(1);
            break;
      default:printf("\nPlease enter a valid choice:");
                }
        }
}
void create()
{
        int i;
        printf("\nEnter the number of elements: ");
        scanf("%d", &n);
        printf("\nEnter the elements: ");
        for(i=0; i<n; i++)
        {
                scanf("%d", &a[i]);
        }
}
void display()
{
        int i;
        if(n == 0)
        {
```

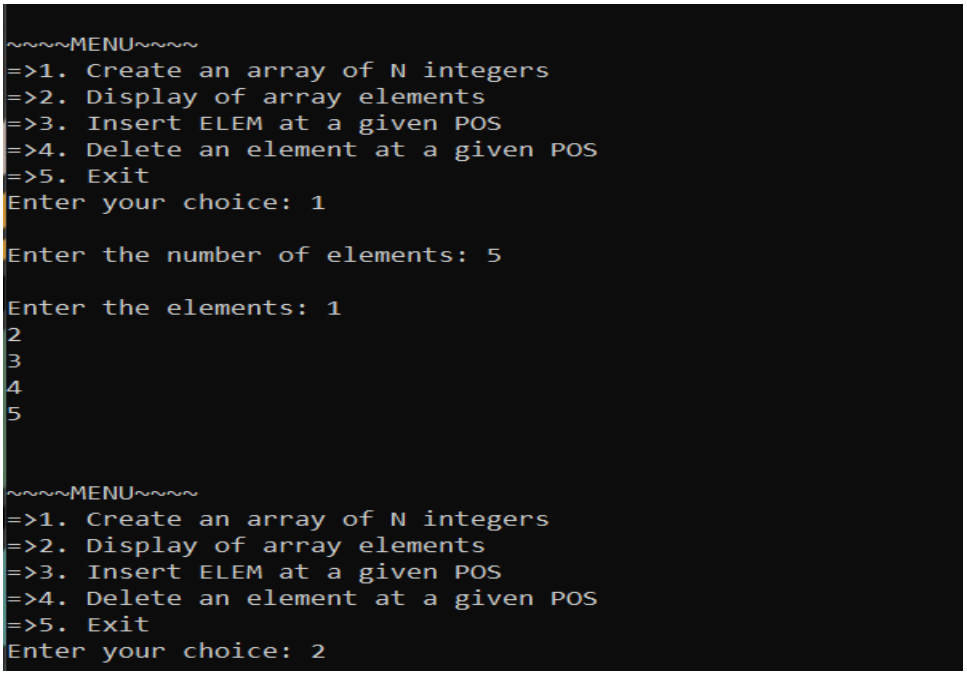
```
                printf("\nNo elements to display");
                return;
        }
        printf("\nArray elements are: ");
        for(i=0; i<n;i++)
                printf("%d\t ", a[i]);
}
void insert()
{
        int i;
        if(n == 5)
        {
      printf("\nArray is full. Insertion is not possible");
                return;
        }
        do
        {
printf("\nEnter a valid position where element to be inserted:    ");
scanf("%d", &pos);
        }while(pos > n);
        printf("\nEnter the value to be inserted:   ");
        scanf("%d", &elem);
```

```
        for(i=n-1; i>=pos ; i--)
        {
                a[i+1] = a[i];
        }
        a[pos] = elem;
        n = n+1;
        display();
}
void del()
{
        int i;
        if(n == 0)
        {
                printf("\nArray is empty and no elements to delete");
                return;
        }
        do
        {
                printf("\nEnter a valid position from where element to be
deleted:    ");
                scanf("%d", &pos);
        }while(pos>=n);
```

```
        elem = a[pos];
        printf("\nDeleted element is : %d \n", elem);
        for( i = pos; i< n-1; i++)
        {
                a[i] = a[i+1];
        }
        n = n-1;
        display();
}
```

3. Result/Output:

All Operations executed successfully.



```
Array elements are: 1    2       3       4       5

~~~~MENU~~~~
=>1. Create an array of N integers
=>2. Display of array elements
=>3. Insert ELEM at a given POS
=>4. Delete an element at a given POS
=>5. Exit
Enter your choice: 3

Array is full. Insertion is not possible

~~~~MENU~~~~
=>1. Create an array of N integers
=>2. Display of array elements
=>3. Insert ELEM at a given POS
=>4. Delete an element at a given POS
=>5. Exit
Enter your choice: 4

Enter a valid position from where element to be deleted:    5

Enter a valid position from where element to be deleted:    4

Deleted element is : 5

Array elements are: 1    2       3       4

~~~~MENU~~~~
=>1. Create an array of N integers
=>2. Display of array elements
=>3. Insert ELEM at a given POS
```

```
Array elements are: 1    2       3       4

~~~~MENU~~~~
=>1. Create an array of N integers
=>2. Display of array elements
=>3. Insert ELEM at a given POS
=>4. Delete an element at a given POS
=>5. Exit
Enter your choice: 3

Enter a valid position where element to be inserted:    4

Enter the value to be inserted:   5

Array elements are: 1    2       3       4       5

~~~~MENU~~~~
=>1. Create an array of N integers
=>2. Display of array elements
=>3. Insert ELEM at a given POS
=>4. Delete an element at a given POS
=>5. Exit
Enter your choice: 5
```

Learning outcomes (What I have learnt):

1. Inserting values in an array.
2. Deleting values from an array.
3. Finding values in an array.
4. Displaying an array.

Evaluation Grid:

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.	Student Performance (Conduct of experiment) objectives/Outcomes.		12
2.	Viva Voce		10
3.	Submission of Work Sheet (Record)		8
	Total		30