Experiment1.1

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Branch: CSE **Section/Group: 717A**
Semester: 3 **Date of Performance:**
Subject Name: Data Structure **Subject Code:21CSH-211**

1. Aim:

Write a menu-driven program that implements the following operations (using separate functions) on a linear array:

1. Insert a new element at the end as well as a ta 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.
   To display the elements of the linear array

2. Algorithm

Algorithm to insert an element in the end from an Array:

- **Step 01:** Initialize the required variable for the program.
- **Step 02:** Take the size of the array from the user.
- **Step 03:** Take the elements of the array from the user.
- **Step 04:** Insert the element in the array.
- **Step 05:** Printing the result array.
- **Step 06:** End program.

Algorithm to insert an element in any position from an Array:

- **Step 01:** Initialize the required variable for the program.
- **Step 02:** Take the size of the array from the user.
- **Step 03:** Take the elements of the array from the user.
- **Step 04:** Take the location to insert an element in the array.
- **Step 05:** Insert the element in the array.
- **Step 06:** Printing the result array.
- **Step 07:** End program.

Algorithm to Delete an element from an Array:

- **Step 01:** Start
- **Step 02:** Initialize counter variable i=pos-1
- **Step 03:** Repeat steps 04 and 05 for i=pos-1 to i<size
- **Step 04:** Move i^{th} element backward (left) a[j]=a[i+1]
- **Step 05:** Increase counter. i=i+1
- **Step 06:** End of step 03 loop.
- **Step 07:** Reset the size of the array. Set size= size-1
- **Step 08:** Stop

Algorithm for Searching an element from an Array:

- **Step 01:** Iterate the array using the loop.
- **Step 02:** Check whether the given is **key** present in the array i.e. arr[i] == key.
- **Step 03:** If yes,
- print "Search Found".
- **Step 04:** Else

- print "Search Not Found".

3. Program CODE

```
#include <iostream>
using namespace std;

int main()
{
    int n, ch;
    cout << "NAME:Rohit Kumar Mahato \n";
    cout << "UID: 21BCS7480\n";
    cout << " \n \n1. Insert a new element at end as well as at a given
position \n";
    cout << "2. Delete an element from a given whose value is given or whose
position is given. \n";
    cout << "3. To find the location of a given element. \n";
    cout << "4. To display the elements of the linear array. \n \n";
    cout << "Select between 1 to 4: ";
    cin >> n;
    if (n == 1)
    {

        cout << " \n Type 0 for inserting element at the end \n";
        cout << "Type 1 for inserting element at specific position \n \n";
        cin >> ch;
        if (ch == 0)
        {
            int arr[50], i, elem;
            cout << " Enter the Array elements";
            for (i = 0; i < 5; i++)
                cin >> arr[i];
            cout << "\n enter the element to insert";
            cin >> elem;
            arr[i] = elem;
            cout << "\n the new array is: \n";
            for (i = 0; i < 6; i++)
                cout << arr[i] << " ";
            cout << endl;
        }
        else if (ch == 1)
        {
            int student[40], pos, i, size, value;
            cout << "enter no of elements in array of students:";
            cin >> size;
            cout << "Enter the value of the elements";
```

```
            for (i = 0; i < size; i++)
                cin >> student[i];
            cout << "enter the position where you want to insert the
element:";
            cin >> pos;
            cout << "enter the value into that poition:";
            cin >> value;
            for (i = size - 1; i >= pos; i--)
                student[i + 1] = student[i];
            student[pos] = value;
            cout << "final array after inserting the value is\n";
            for (i = 0; i <= size; i++)
                cout << student[i] << endl;
        }
    }

    else if (n == 2)
    {
        int i, posi, arr[5];
        cout << "Enter the elemts of the array";

        for (i = 0; i < 5; i++)
            cin >> arr[i];
        cout << " Enter the position";
        cin >> posi;
        if (arr[i] = posi)
        {
            for (i = posi; i <= 5; i++)
            {
                arr[i] = arr[i + 1];
            }
            for (i = 0; i < 4; i++)
                cout << arr[i] << endl;
        }
        else
            cout << " position is not found";
    }

    else if (n == 3)
    {
        int size;
        int position, number, i;
        cout << "Enter number of elements - " << endl;
        cin >> size;
        int a[size], fact = 0;
        cout << "Enter the elements in the array - " << endl;
        for (int k = 0; k < size; k++)
```

```
        {
            cin >> a[k];
        }
        cout << "Enter the number you want to search - ";
        cin >> number;
        for (int i = 0; i < size; i++)
        {
            if (number == a[i])
            {
                fact = 1;
                position = i + 1;
            }
        }
        if (fact == 1)
        {
            cout << "The number is found ! " << endl;
            cout << "It is at the position : " << position << endl;
        }
        else
        {
            cout << "The number is not in the array bro!" << endl;
        }
    }
    else if (n == 4)
    {
        int size;
        int position, number, i;
        cout << "Enter number of elements - " << endl;
        cin >> size;
        int a[size], fact = 0;
        cout << "Enter the elements in the array - " << endl;
        for (int k = 0; k < size; k++)
        {

            cin >> a[k];
        }
        cout << "The new array is - " << endl;
        for (int k = 0; k < size; k++)
        {
            cout << a[k] << " ";
        }
    }
    else
    {
        cout << "Invalid Number";
    }
}
```

Output

1.1

```
PS C:\Users\mahat\OneDrive\Desktop\DATA STRUCTURE LAB> cd "c:\Users\mahat\OneDrive\Desktop\D
NAME:Rohit Kumar Mahato
UID: 21BCS7480


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.

Select between 1 to 4: 1

 Type 0 for inserting element at the end
Type 1 for inserting element at specific position

0
 Enter the Array elements12
45
74
10
5

 enter the element to insert5

 the new array is:
12 45 74 10 5 5
```

1.2

```
NAME:Rohit Kumar Mahato
UID: 21BCS7480


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.

Select between 1 to 4: 1

 Type 0 for inserting element at the end
Type 1 for inserting element at specific position

1
enter no of elements in array of students:5
Enter the value of the elements1
2
3
4
5
enter the position where you want to insert the element:2
enter the value into that poition:33
final array after inserting the value is
1
2
33
3
4
5
PS C:\Users\mahat\OneDrive\Desktop\DATA STRUCTURE LAB>
```

2

```
NAME:Rohit Kumar Mahato
UID: 21BCS7480


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.

Select between 1 to 4: 2
Enter the elemts of the array12
4
5
3
4
 Enter the position2
12
4
3
4
PS C:\Users\mahat\OneDrive\Desktop\DATA STRUCTURE LAB>
```

3

```
NAME:Rohit Kumar Mahato
UID: 21BCS7480


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.

Select between 1 to 4: 3
Enter number of elements -
5
Enter the elements in the array -
12
45
66
77
8
Enter the number you want to search - 8
The number is found !
It is at the position : 5
PS C:\Users\mahat\OneDrive\Desktop\DATA STRUCTURE LAB>
```

4.

```
NAME:Rohit Kumar Mahato
UID: 21BCS7480


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.

Select between 1 to 4: 4
Enter number of elements -
5
Enter the elements in the array -
1
2
3
4
5
The new array is -
1 2 3 4 5
PS C:\Users\mahat\OneDrive\Desktop\DATA STRUCTURE LAB>
```

Learning Outcomes

1. **Concept of an array**
2. **Learn how to insert, delete, finding array**

- **Evaluation Grid:**

Sr. No.	Parameters	Maximum Marks	Marks Obtained
1.	Worksheet completion including writing learning objectives/Outcomes.(To be submitted at the end of the day).	8	
2.	Viva Voce	10	
3.	Student Engagement in Simulation/Demonstration/Performance and Controls	12	
	Signature of Faculty (with Date):	Total Marks Obtained out of 30:	