Experiment 1.1

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Date of performance: | Subject name: Data Structures

AIM:

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.

CODE:

```
// Write a menu driven program that implement operations on a linear array

#include <iostream>
using namespace std;

int main()
{
    bool exit = false;
    char YesNo;
    while (!exit)

    {
        // Menu Driven List
        int 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;

        // Insert a new element at end as well as at a given position.
        if (n == 1)
        {

            int ch;
            cout << " \n Type 0 for inserting element at the end \n";
            cout << "Type 1 for inserting element at specific position \n \n";
            cin >> ch;

            // Inserting element at the end

            if (ch == 0)
            {
                int size;
                int position, num, i;
                cout << "Enter number of elements - " << endl;
                cin >> size;
                int a[size];
                cout << "Enter the elements in the array - " << endl;
                for (int k = 0; k < size; k++)
                {
                    cin >> a[k];
                }
                cout << "Enter the element to insert - ";
                cin >> num;
                int l = size;
                a[l] = num;

                cout << "The new array is - " << endl;
                for (int j = 0; j < size + 1; j++)
                {
                    cout << a[j] << " ";
                }
            }

            // Inserting elements at specific position

            else if (ch == 1)
            {
                int size;
                int position, number, i;
                cout << "Enter number of elements - " << endl;
                cin >> size;
                int a[size];
                cout << "Enter the elements in the array - " << endl;
```

```
                for (int k = 0; k < size; k++)
                {
                    cin >> a[k];
                }
                cout << "Enter the element to insert - ";
                cin >> number;
                cout << "Enter the position at which you want to insert the new
element- ";
                cin >> position;
                if (position > size + 1)
                {
                    cout << "Insertion is not possible";
                }
                else
                {
                    for (i = size; i >= position; i--)
                    {
                        a[i] = a[i - 1];
                    }
                    a[i] = number;
                }

                cout << "The new array is - " << endl;
                for (int j = 0; j < size + 1; j++)
                {
                    cout << a[j] << " ";
                }
            }
            else
            {
                cout << "Invalid Input";
            }
        }

        // Delete an element from a given whose value is given or whose position is
given.

        else if (n == 2)
        {
            int size;
            int position, number, i;
            cout << "Enter number of elements - " << endl;
            cin >> size;
            int a[size];
            cout << "Enter the elements in the array - " << endl;
            for (int k = 0; k < size; k++)
            {
                cin >> a[k];
            }
            cout << "Enter the position - ";
            cin >> position;
```

```
        if (position >= size + 1)
        {
            cout << "Deletion not possible ! " << endl;
        }
        else
        {
            for (int c = position - 1; c <= size - 1; c++)
            {
                a[c] = a[c + 1];
            }
        }

        cout << "The new array is - " << endl;
        for (int k = 0; k < size - 1; k++)
        {
            cout << a[k] << " ";
        }
    }

    // To find the location of a given element. i.e Searching

    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;
            }
        }
        // Display elements of the array
        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];
            }

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

        //Wish to continue or not

        cout << " \n \n Do you want to continue? (Y or N) \n";
        cin >> YesNo;

        if (YesNo == 'N' || YesNo == 'n')
        {
            exit = true;
        }
    }

    system("pause");
    return 0;
}
```

OUTPUT:

```
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 number of elements -
4
Enter the elements in the array -
5 6 4 8
Enter the element to insert - 9
The new array is -
5 6 4 8 9

 Do you want to continue? (Y or N)
y


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 -
4
Enter the elements in the array -
8 9 7 5
Enter the number you want to search - 9
The number is found !
It is at the position : 2


 Do you want to continue? (Y or N)
n
Press any key to continue . . .
```