

## EXPERIMENT NUMBER –1

NAME – <b>Diya</b>	SUBJECT – <b>DATA STRUCTURE</b>
UID – <b>21BCS2632</b>	SUBJECT CODE – <b>21CSH-211</b>
CLASS AND GROUP – <b>607-B</b>	SEMESTER – <b>3<sup>rd</sup></b>

**AIM OF THE EXPERIMENT:** 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.

### **PROGRAM CODE:**

```
#include <iostream>
using namespace std;
int main()
{
    bool exit = false;
    char YesNo;
    while (!exit)
    {

        int n;
        cout<<"NAME:DIYA \n";
        cout<<"UID: 21BCS2632 \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)
        {
            int ch;
            cout << " \n Type 0 for inserting element at the end \n";
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```

```
cout << "Type 1 for inserting element at specific position \n \n";  
cin >> ch;
```

```
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] << " ";  
    }  
}
```

```
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";  
}  
}  
  
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] << " ";
}
}

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++)
    {
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```

```
cin >> a[k];
}

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

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;
}
```

```

1 #include <iostream>
2 using namespace std;
3 int main()
4 {
5     bool exit = false;
6     char YesNo;
7     while (!exit)
8     {
9
10    int n;
11    cout<<"NAME:DIYA \n";
12    cout<<"UID: 21BCS2632 \n";
13    cout<<" \n \n1. Insert a new element at end as well as at a given position \n";
14    cout<<"2. Delete an element from a given whose value is given or whose position is given. \n";
15    cout<<"3. To find the location of a given element. \n";
16    cout<<"4. To display the elements of the linear array. \n \n";
17    cout<<"Select between 1 to 4: ";
18    cin >> n;
19
20    if (n == 1)
21    {
22        int ch;
23        cout << " \n Type 0 for inserting element at the end \n";
24        cout << "Type 1 for inserting element at specific position \n \n";
25        cin >> ch;
26
27        if (ch == 0)
28        {
29            int size;
30            int position, num, i;
31            cout << "Enter number of elements - " << endl;
32            cin >> size;
33            int a[size];
34            cout << "Enter the elements in the array - " << endl;
35            for (int k = 0; k < size; k++)

```

```

36    {
37        cin >> a[k];
38    }
39    cout << "Enter the element to insert - ";
40    cin >> num;
41    int l = size;
42    a[l] = num;
43    cout << "The new array is - " << endl;
44    for (int j = 0; j < size + 1; j++)
45    {
46        cout << a[j] << " ";
47    }
48    }
49
50    else if (ch == 1)
51    {
52        int size;
53        int position, number, i;
54        cout << "Enter number of elements - " << endl;
55        cin >> size;
56        int a[size];
57        cout << "Enter the elements in the array - " << endl;
58        for (int k = 0; k < size; k++)
59        {
60            cin >> a[k];
61        }
62        cout << "Enter the element to insert - ";
63        cin >> number;
64        cout << "Enter the position at which you want to insert the new element- ";
65        cin >> position;
66        if (position > size + 1)
67        {
68            cout << "Insertion is not possible";
69        }
70    else

```

```

71- {
72- for (i = size; i >= position; i--)
73- {
74- a[i] = a[i - 1];
75- }
76- a[i] = number;
77- }
78- cout << "The new array is - " << endl;
79- for (int j = 0; j < size + 1; j++)
80- {
81- cout << a[j] << " ";
82- }
83- }
84- else
85- {
86- cout << "Invalid Input";
87- }
88- }
89-
90- else if (n == 2)
91- {
92- int size;
93- int position, number, i;
94- cout << "Enter number of elements - " << endl;
95- cin >> size;
96- int a[size];
97- cout << "Enter the elements in the array - " << endl;
98- for (int k = 0; k < size; k++)
99- {
100- cin >> a[k];
101- }
102- cout << "Enter the position - ";
103- cin >> position;
104- if (position >= size + 1)
105- {

```

```

105- {
106- cout << "Deletion not possible ! " << endl;
107- }
108- else
109- {
110- for (int c = position - 1; c <= size - 1; c++)
111- {
112- a[c] = a[c + 1];
113- }
114- }
115- cout << "The new array is - " << endl;
116- for (int k = 0; k < size - 1; k++)
117- {
118- cout << a[k] << " ";
119- }
120- }
121-
122- else if (n == 3)
123- {
124- int size;
125- int position, number, i;
126- cout << "Enter number of elements - " << endl;
127- cin >> size;
128- int a[size], fact = 0;
129- cout << "Enter the elements in the array - " << endl;
130- for (int k = 0; k < size; k++)
131- {
132- cin >> a[k];
133- }
134- cout << "Enter the number you want to search - ";
135- cin >> number;
136- for (int i = 0; i < size; i++)
137- {
138- if (number == a[i])
139- {

```

```
main.cpp
139 {
140     fact = 1;
141     position = i + 1;
142 }
143 }
144 if (fact == 1)
145 {
146     cout << "The number is found ! " << endl;
147     cout << "It is at the position : " << position << endl;
148 }
149 else
150 {
151     cout << "The number is not in the array bro!" << endl;
152 }
153 }
154
155 else if (n == 4)
156 {
157     int size;
158     int position, number, i;
159     cout << "Enter number of elements - " << endl;
160     cin >> size;
161     int a[size], fact = 0;
162     cout << "Enter the elements in the array - " << endl;
163     for (int k = 0; k < size; k++)
164     {
165         cin >> a[k];
166     }
167
168     cout << "The new array is - " << endl;
169     for (int k = 0; k < size; k++)
170     {
171         cout << a[k] << " ";
172     }
173 }
174 else
175 {
176     cout << "Invalid Number";
177 }
178
179 cout << "\n\n Do you want to continue? (Y or N) \n";
180 cin >> YesNo;
181 if (YesNo == 'N' || YesNo == 'n')
182 {
183     exit = true;
184 }
185 }
186 system("pause");
187 return 0;
188 }
189
190
```



## OUTPUT:

```
input
NAME:DIYA
UID: 21BCS2632

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 -
8
Enter the elements in the array -
2
1
3
6
7
9
8
4
Enter the number you want to search - 2
The number is found !
It is at the position : 1

Do you want to continue? (Y or N)
Y
NAME:DIYA
UID: 21BCS2632

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.
```