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EXPERIMENT NUMBER –1

NAME – Diya	**SUBJECT –** DATA STRUCTURE
UID – 21BCS2632	**SUBJECT CODE –** 21CSH-211
CLASS AND GROUP – 607-B	**SEMESTER –** 3rd

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";
```

```
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++)
{
```

```
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;
}
```

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main.cpp

```cpp
#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";
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++)
```

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main.cpp

```cpp
{
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
```

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main.cpp

```
{
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)
{
```

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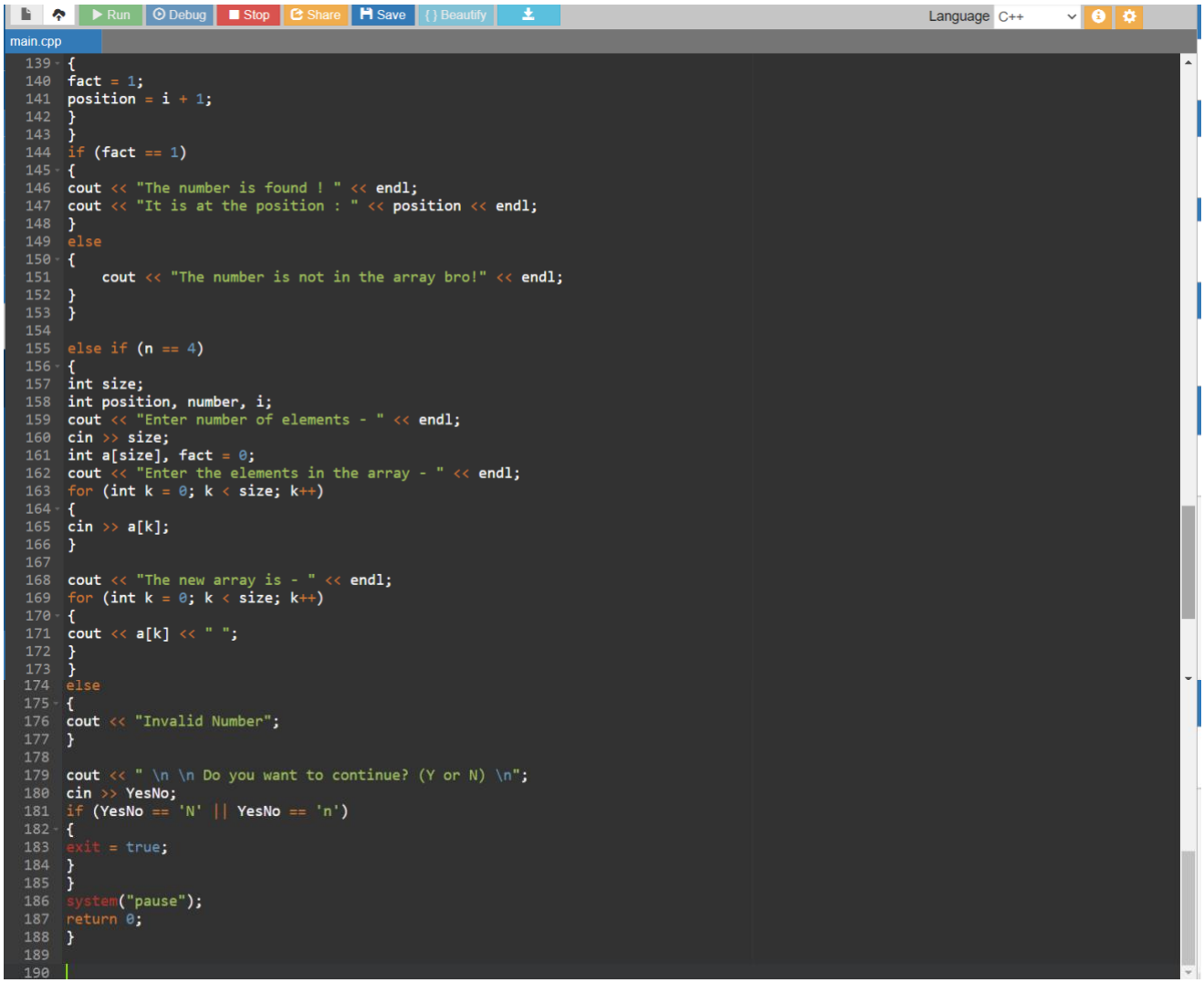
main.cpp

```
{
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])
{
```



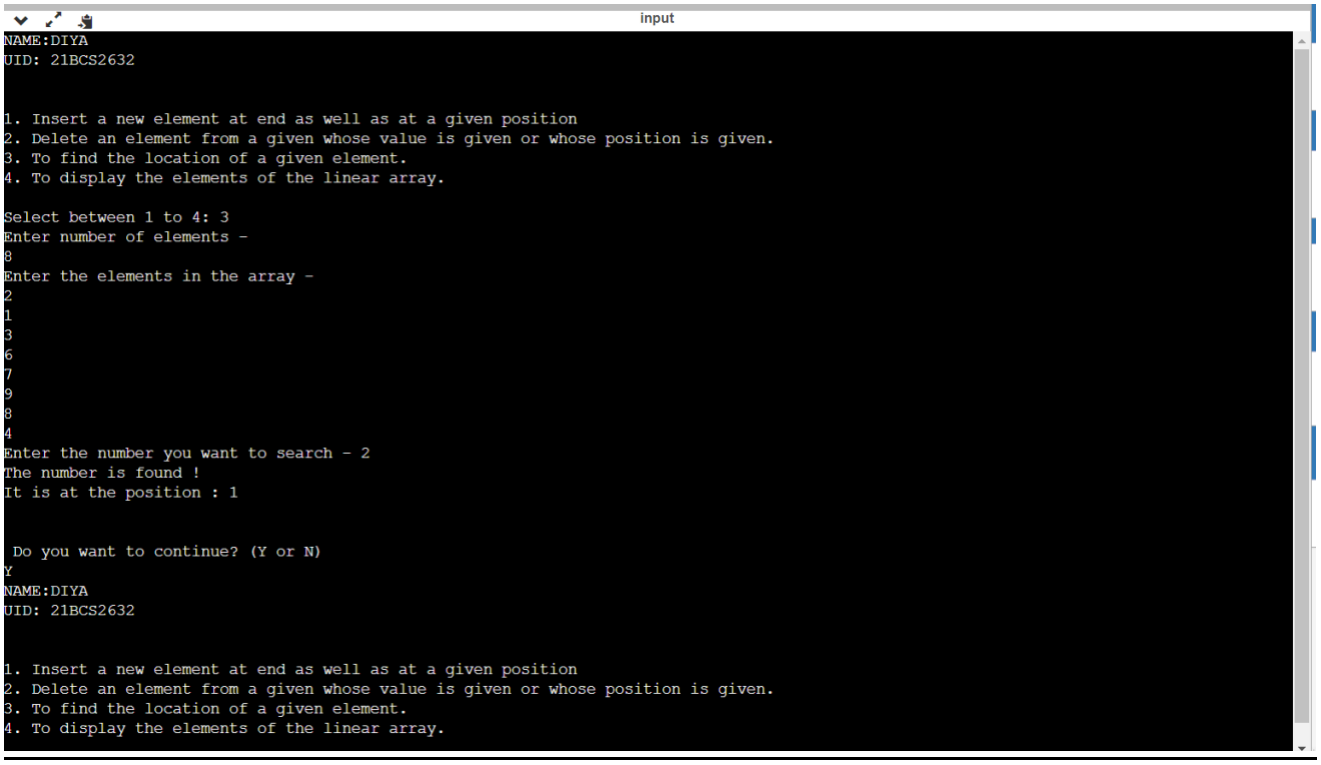

```
{
fact = 1;
position = i + 1;
}
}
if (fact == 1)
{
cout << "The number is found ! " << endl;
cout << "It is at the position : " << position << endl;
}
else
{
    cout << "The number is not in the array bro!" << endl;
}
}

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++)
{
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;
}
```

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.