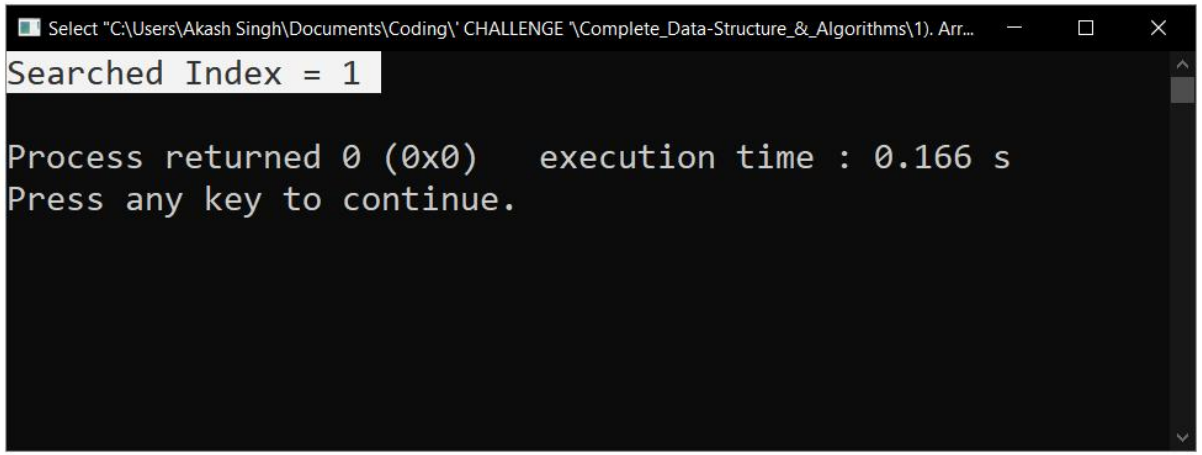
_1)_Search_Element.cpp

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

int search(int arr[], int n, int x)
{
    for(int i = 0; i < n; i++)
    {
        if(arr[i] == x)
            return i;
    }

    return -1;
}

int main()
{
    int arr[] = {20, 5, 7, 25}, x = 5;
    cout<<"Searched Index = "<<search(arr, 4, x)<<endl;;
}
```



_2)_Insert_Element.cpp

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

int insert(int arr[], int n, int x, int cap, int pos)
{
    if(n == cap)
        return n;
    int idx = pos - 1;
    for(int i = n - 1; i >= idx; i--)
    {
        arr[i + 1] = arr[i];
    }
    arr[idx] = x;
    return n + 1;
}

int main()
{
        int arr[5], cap = 5, n = 3;
        arr[0] = 5; arr[1] = 10; arr[2] = 20;
        cout<<"Before Insertion"<<endl;
        for(int i=0; i < n; i++)
        {
         cout<<arr[i]<<" ";
        }
        cout<<endl;
        int x = 7, pos = 2;
        n = insert(arr, n, x, cap, pos);
        cout<<"After Insertion"<<endl;
        for(int i=0; i < n; i++)
        {
             cout<<arr[i]<<" ";
        }
}
```

```
Select "C:\Users\Akash Singh\Documents\Coding\' CHALLENGE '\Complete_Data-Structure_&_Algorithms\1...
Before Insertion
5 10 20
After Insertion
5 7 10 20
Process returned 0 (0x0)   execution time : 0.286 s
Press any key to continue.
```

_3)_Delete_Element.cpp

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

int deleteEle(int arr[], int n, int x)
{
    int i = 0;
    for(i = 0; i < n; i++)
    {
        if(arr[i] == x)
            break;
    }
    if(i == n)
        return n;
    for(int j = i; j < n - 1; j++)
    {
        arr[j] = arr[j + 1];
    }
    return n-1;
}

int main()
{
        int arr[] = {3, 8, 12, 5, 6}, x = 12, n = 5;
        cout<<"Before Deletion"<<endl;
        for(int i=0; i < n; i++)
        {
         cout<<arr[i]<<" ";
        }
        cout<<endl;
        n = deleteEle(arr, n, x);
        cout<<"After Deletion"<<endl;
        for(int i=0; i < n; i++)
        {
             cout<<arr[i]<<" ";
        }
}
```

```
Select "C:\Users\Akash Singh\Documents\Coding\' CHALLENGE '\Complete_Data-Structure_&_Algorithms\1). Array\_3)_...
Before Deletion
3 8 12 5 6
After Deletion
3 8 5 6
Process returned 0 (0x0)   execution time : 0.130 s
Press any key to continue.
```

_4)_Reverse_Array.cpp

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

 void reverse(int arr[], int n)
{
    int low = 0, high = n - 1;
    while(low < high)
    {
        int temp = arr[low];
        arr[low] = arr[high];
        arr[high] = temp;

        low++;
        high--;
    }
}

int main()
{
       int arr[] = {10, 5, 7, 30}, n = 4;
       cout<<"Before Reverse"<<endl;
       for(int i = 0; i < n; i++)
       {
            cout<<arr[i]<<" ";
       }
       cout<<endl;
       reverse(arr, n);
       cout<<"After Reverse"<<endl;
       for(int i = 0; i < n; i++)
       {
            cout<<arr[i]<<" ";
       }
}

```

```
Select "C:\Users\Akash Singh\Documents\Coding\' CHALLENGE '\Complete_Data-Structure_&_Algorith...
Before Reverse
10 5 7 30
After Reverse
30 7 5 10
Process returned 0 (0x0)   execution time : 0.231 s
Press any key to continue.
```

_5)_Left_Rotate_Array_by_1.cpp

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

void lRotateOne(int arr[], int n)
{
    int temp = arr[0];
    for(int i = 1; i < n; i++)
    {
        arr[i - 1] = arr[i];
    }
    arr[n - 1] = temp;
}

int main()
{
       int arr[] = {1, 2, 3, 4, 5}, n = 5;
       cout<<"Before Left Rotation"<<endl;
       for(int i = 0; i < n; i++)
       {
            cout<<arr[i]<<" ";
       }
       cout<<endl;
       lRotateOne(arr, n);
       cout<<"After '1' Left Rotation"<<endl;
       for(int i = 0; i < n; i++)
       {
            cout<<arr[i]<<" ";
       }
}
```

```
Select "C:\Users\Akash Singh\Documents\Coding\' CHALLENGE '\Complete_Data-Structure_&_Algorithms\1). Array\_5)_Left_Rotate_Array_by_1.e...
Before Left Rotation
1 2 3 4 5
After '1' Left Rotation
2 3 4 5 1
Process returned 0 (0x0)   execution time : 0.130 s
Press any key to continue.
```

_6)_Left_Rotate_Array_by_d_(Time_dN).cpp

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

void lRotateOne(int arr[], int n)
{
    int temp = arr[0];
    for(int i = 1; i < n; i++)
    {
        arr[i - 1] = arr[i];
    }
    arr[n - 1] = temp;
}
void leftRotate(int arr[], int d, int n)
{
    for(int i = 0; i < d; i++)
    {
        lRotateOne(arr, n);
    }
}
int main()
{
        int arr[] = {1, 2, 3, 4, 5}, n = 5, d = 2;
        cout<<"Before Left Rotation"<<endl;
        for(int i = 0; i < n; i++)
        {
            cout<<arr[i]<<" ";
        }
        cout<<endl;
        leftRotate(arr, d, n);
        cout<<"After '2' Left Rotation"<<endl;
        for(int i = 0; i < n; i++)
        {
            cout<<arr[i]<<" ";
        }
}

```

```
Select "C:\Users\Akash Singh\Documents\Coding\' CHALLENGE '\Complete_Data-Structure_&_Algorithms\1). Array\_6)_Left_Rotate_Array_by_d_(Time_...
Before Left Rotation
1 2 3 4 5
After '2' Left Rotation
3 4 5 1 2
Process returned 0 (0x0)   execution time : 0.207 s
Press any key to continue.
```

_7)_Left_Rotate_Array_by_d_(Time_N).cpp

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

void leftRotate(int arr[], int d, int n)
{
    int temp[d];
    for(int i = 0; i  < d; i++)
    {
        temp[i] = arr[i];
    }
    for(int i = d; i  < n; i++)
    {
        arr[i - d] = arr[i];
    }
    for(int i = 0; i  < d; i++)
    {
        arr[n - d + i] = temp[i];
    }
}

int main()
{
      int arr[] = {1, 2, 3, 4, 5}, n = 5, d = 2;
      cout<<"Before Left Rotation"<<endl;
       for(int i = 0; i < n; i++)
       {
            cout<<arr[i]<<" ";
       }
       cout<<endl;
       leftRotate(arr, d, n);
       cout<<"After '2' Left Rotation"<<endl;
       for(int i = 0; i < n; i++)
       {
            cout<<arr[i]<<" ";
       }
}
```

```
Select "C:\Users\Akash Singh\Documents\Coding\' CHALLENGE '\Complete_Data-Structure_&_Algorithms\1). Array\_7)_Left_Rotate_Array_by_d_(Time_N).exe"
Before Left Rotation
1 2 3 4 5
After '2' Left Rotation
3 4 5 1 2
Process returned 0 (0x0)   execution time : 0.094 s
Press any key to continue.
```

_8)_Left_Rotate_Array_by_d_(Time_N).cpp

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

void reverse(int arr[], int low, int high)
{
    while(low < high)
    {
        swap(arr[high], arr[low]);
        low++;
        high--;
    }
}

void leftRotate(int arr[], int d, int n)
{
    reverse(arr, 0, d - 1);
    reverse(arr, d, n - 1);
    reverse(arr, 0, n - 1);
}

int main()
{
      int arr[] = {1, 2, 3, 4, 5}, n = 5, d = 4;
      cout<<"Before Left Rotation"<<endl;
       for(int i = 0; i < n; i++)
       {
            cout<<arr[i]<<" ";
       }
       cout<<endl;
       leftRotate(arr, d, n);
       cout<<"After '4' Left Rotation"<<endl;
       for(int i = 0; i < n; i++)
       {
            cout<<arr[i]<<" ";
       }
}
```

```
Select "C:\Users\Akash Singh\Documents\Coding\' CHALLENGE '\Complete_Data-Structure_&_Algorithms\1). Array\_8)_Left_Rotate_Array_by_d_...
Before Left Rotation
1 2 3 4 5
After '4' Left Rotation
5 1 2 3 4
Process returned 0 (0x0)   execution time : 0.150 s
Press any key to continue.
```