**Experiment No. - 1.2**

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**Subject Name: ADVANCED PROGRAMMING LAB**

**Subject Code: 20CSP-334**

1. **Aim/Overview of the practical:**

A left rotation operation on the array of size “n” , shift each of the array elements by one unit to the left, given array of “n” integers and a number “d” , perform “d” left rotations on the array , then print the updated array as a single line of “n” space separated integers denoting the final state of array after performing the left rotations.

1. **Task to be done:**

A left rotation operation on the array of size “n” , shift each of the array elements by one unit to the left, given array of “n” integers and a number “d” , perform “d” left rotations on the array , then print the updated array as a single line of “n” space separated integers denoting the final state of array after performing the left rotations.

1. **Steps for practical**:
2. Include the header files.
3. Take the size of an array, array elements, and d.
4. Call the left\_rotation\_by\_d () function.
5. Now in left\_rotation\_by\_d function, we call reverse\_elements() function and we reverse the first “0” to “d-1” elements of the array, then we again reverse “d” to “n-1” elements, and then finally we will reverse the “0” to “n-1” elements of the array.
6. Finally, we will get the “d” times left rotated, we will print it by “n” space separated integers.

**4 . Code:**

#include<bits/stdc++.h>

using namespace std;

void reverse\_elements(int arr[], int start,int end)

{

while(start<=end)

{

swap(arr[start++],arr[end--]);

}

}

void left\_rotation\_by\_d(int arr[],int n,int d)

{

reverse\_elements(arr,0,d-1);

reverse\_elements(arr,d,n-1);

reverse\_elements(arr,0,n-1);

cout<<"Left rotated elements of the array are: ";

for(int i=0; i<n; i++)

{

cout<<arr[i]<<" ";

}

}

int32\_t main()

{

int n;

cout<<"Enter the size of the array: ";

cin>>n;

int arr[n];

cout<<"Enter the array elements: ";

for(int i=0; i<n; i++)

{

cin>>arr[i];

}

cout<<"Enter the value of d left rotations to be performed on the array: ";

int d;

cin>>d;

left\_rotation\_by\_d(arr,n,d);

return 0;

}

**5.** **Output:**



