# Experiment 3

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**Subject Name:** Design And Analysis of Algorithms Lab
**Subject Code:** 20CSP_312

## 1. Aim/Overview of the practical:

Code to find frequency of elements in a given array in O(n) time complexity.

## 2. Task to be done/ Which logistics used:

To find the frequency of element in array using for loop.

## 3. Algorithm/Flowchart (For programming based labs):

Step 1: Let us make an array of size n taken by user.
Step 2: Put the values in it.
Step 3: Make a variable freq=1 and idx=1 and element=arr[0].
Step 4: Now run a while loop to compare arr[idx-1] with arr[idx] if they are equal then increment of freq and ldx by 1 is there else print frequency of the element..
Step 5: Run the while loop till idx<n.

**4. Steps for experiment/practical/Code:**

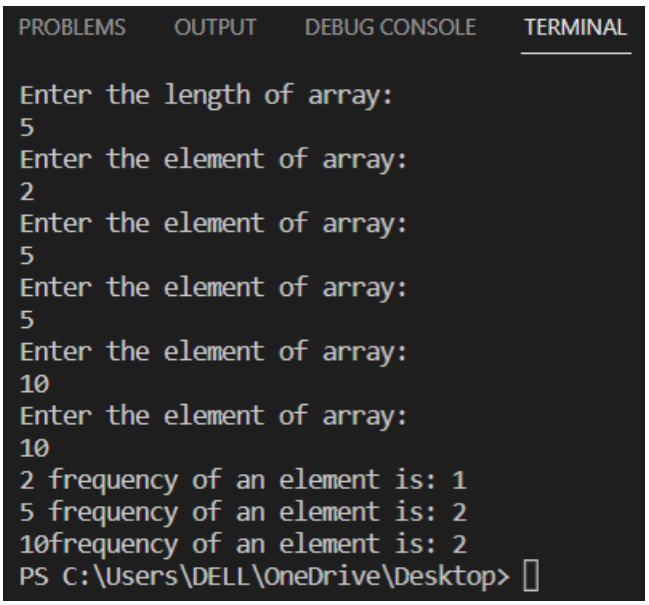
```
#include <iostream>
using namespace std;

int main()
{
   int n;
   cout<<"Enter the length of array: "<<endl;
   cin>>n;
   int arr[n];
   for(int i=0;i<n;i++)
   {
      cout<<"Enter the element of array: "<<endl;
      cin>>arr[i];
   }
   int freq = 1;
   int idx = 1;
   int element = arr[0];
   while (idx < n)
   {
      if (arr[idx - 1] == arr[idx])
      {
         freq++;
         idx++;
      }
      else
      {
         cout << element << " frequency of an element is: " << freq << endl;
         element = arr[idx];
         idx++;

         freq = 1;
```

```
    }
  }
  cout << element << "frequency of an element is: " << freq <<endl;
}
```

## 5. Observations/Discussions/ Complexity Analysis:

Time complexity of finding frequency of elements of an array is O(n).

## 6. Result/Output/Writing Summary:




## Learning outcomes (What I have learnt):

1. To learn how to calculate the frequency of the elements of an array.
2. To learn how to use for loop in these cases.

**Evaluation Grid (To be created as per the SOP and Assessment guidelines by the faculty):**

| Sr. No. | Parameters | Marks Obtained | Maximum Marks |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
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