

## Lab -1

Q1) Write a C/C++ program to find the average of n numbers using arrays.

Solution:

```
#include<bits/stdc++.h>
```

```
using namespace std;
```

```
int main(){
```

```
    int n;
```

```
    int sum=0;
```

```
    float avg;
```

```
    cout<<"Enter the no of elements in an array:";
```

```
    cin>>n;
```

```
    int arr[n];
```

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

```
        cout<<"Enter the "<<i+1<<" element :";
```

```
        cin>>arr[i];
```

```
    }
```

```
    cout<<"Calculating average:";
```

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

```
        sum+=arr[i];
```

```
    }
```

```
    avg=sum/(float)n;
```

```
    cout<<"the average is: "<<avg;
```

```
}
```

```
C:\Users\992510302\Documents\Untitled2.exe
Enter the no of elements in an array:3
Enter the 1 element :34
Enter the 2 element :56
Enter the 3 element :78
Calculating average:the average is: 56
Process returned 0 (0x0)   execution time : 5.644 s
Press any key to continue.
```

Q2)) Write a C/C++ program to find the frequency of each element in an array.

Solution:

```
#include <iostream>
```

```
using namespace std;
```

```
int main() {
```

```
    int n;
```

```
    cout << "Enter the number of elements in the array: ";
```

```
    cin >> n;
```

```
    int arr[n];
```

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

```
        cout << "Enter element " << i + 1 << ": ";
```

```
        cin >> arr[i];
```

```
    }
```

```
    int maxElement = arr[0];
```

```
    for (int i = 1; i < n; i++) {
```

```
        maxElement = max(maxElement, arr[i]);
    }

    int freq[maxElement + 1] = {0};

    for (int i = 0; i < n; i++) {
        freq[arr[i]]++;
    }

    cout << "Displaying the frequency of each element:\n";
    for (int i = 0; i <= maxElement; i++) {
        if (freq[i] > 0) {
            cout << "Frequency of " << i << " is: " << freq[i] << endl;
        }
    }

    return 0;
}
```

```
C:\Users\9923103025\Documents\Untitled2.exe
Enter the number of elements in the array: 5
Enter element 1: 12
Enter element 2: 12
Enter element 3: 23
Enter element 4: 45
Enter element 5: 56
Displaying the frequency of each element:
Frequency of 12 is: 2
Frequency of 23 is: 1
Frequency of 45 is: 1
Frequency of 56 is: 1

Process returned 0 (0x0)   execution time : 9.390 s
Press any key to continue.
```

Q3)) Given an array, write a program in C/C++ to left rotate the elements of the array by one

Sol)) #include<iostream>

using namespace std;

int main(){

int n;

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

cin>>n;

int arr[n];

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

cin>>arr[i];

}

int temp2=arr[0];

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

{

arr[i-1]=arr[i];

```

    }

    arr[n-1]=temp2;

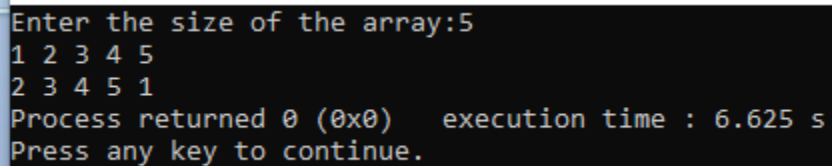
    for(int i=0;i<n;i++){

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

    }

}

```



```

Enter the size of the array:5
1 2 3 4 5
2 3 4 5 1
Process returned 0 (0x0)   execution time : 6.625 s
Press any key to continue.

```

Q4)) Write a C/C++ program to find the second smallest element in a one-dimensional array.

```

#include<iostream>

using namespace std;

int main(){

    int n;

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

    cin>>n;

    int arr[n];

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

        cout<<"Enter the element "<<i+1<<" :",

        cin>>arr[i];
    }
}

```

```

    }

    int min=arr[0];

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

        if(arr[i]<min){

            min=arr[i];

        }

    }

    cout<<"the smallest element in an array is:"<<min;

}

```

```

Enter the size of elements:5
Enter the element 1 :98
Enter the element 2 :12
Enter the element 3 :-8
Enter the element 4 :-4
Enter the element 5 :23
the smallest element in an array is:-8
Process returned 0 (0x0)   execution time : 8.306 s
Press any key to continue.
|

```

Q5)) A dynamically created array stores following integer elements (odd and even integers). It is desired to print/display the elements of this array in such manner that it first prints all the even elements then it prints all the odd elements.

```
#include<iostream>
```

```
using namespace std;

int main(){

    int n;

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

    cin>>n;

    int arr[n];

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

        cout<<"Enter the element "<<i+1<<" :",

        cin>>arr[i];

    }

    int new_arr[n];

    int k=0;

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

        if(arr[i]%2==0){

            new_arr[k++]=arr[i];

        }

    }

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

        if(arr[i]%2!=0){

            new_arr[k++]=arr[i];

        }

    }
```

```

    }

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

        cout<<new_arr[i]<<" ";

    }

}

```

```

Enter the size of elements:5
Enter the element 1 :2
Enter the element 2 :8
Enter the element 3 :9
Enter the element 4 :4
Enter the element 5 :1
2 8 4 9 1
Process returned 0 (0x0)   execution time : 9.996 s
Press any key to continue.

```

Q6)) Write a program without STL to create the dynamic array of user inputted length (n), assign values at different indices of the array, and as presented in above example, display the elements of this array.

```

#include<iostream>

using namespace std;

int main(){

    int n;

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

```



```
cin>>n;

int *arr=new int[n];

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

    arr[i]=rand()%100;

}

int *new_arr=new int[n];

int k=0;


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

    if(arr[i]%2==0){

        new_arr[k++]=arr[i];

    }

}

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

    if(arr[i]%2!=0){

        new_arr[k++]=arr[i];

    }

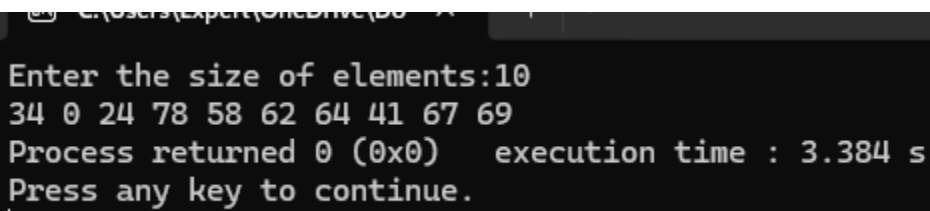
}


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

    cout<<new_arr[i]<<" ";

}
```

```
delete[] arr;  
  
delete[] new_arr;  
  
}
```



A screenshot of a terminal window with a black background and white text. The text shows the program's execution flow: it prompts for the size of elements (10), displays a list of 10 integers (34 0 24 78 58 62 64 41 67 69), reports the process return code (0) and execution time (3.384 s), and finally prompts the user to press any key to continue. A cursor is visible on the line following the prompt.

```
C:\Users\Expert\OneDrive\Documents> .\Program1.exe  
Enter the size of elements:10  
34 0 24 78 58 62 64 41 67 69  
Process returned 0 (0x0)   execution time : 3.384 s  
Press any key to continue.  
|
```

Q7))

(a)

Size of o1 : 4

Size of o2 : 16

Size of abc is : 16

(b)

Size of o1 : 4

Size of o2 : 24

(c)

Size of o1 : 4

Size of o2 : 24

(d)

Size of o1 : 4

Size of o2 : 24

(e)

Size of o1 : 4

Size of o2 : 16

(f)

Size of o1 : 4

Size of o2 : 20

Q8))

(a)

4.5

(b)

5

(c)

44

(d)

Error: invalid conversion from 'int\*' to 'int';

(e)

5

(f)

4

(g)

5

(h)

Garbage value