

# WEEK-5

**#1** Write a C++ program to enter elements in the array and display the array elements.

This is the required code:

```
1  #include <iostream>
2  using namespace std;
3  int main()
4  {
5      int n;
6      cout << "Enter the number of elements you want in the array\n";
7      cin >> n;
8      int ar[n];
9      cout << "Enter the elements of the array\n";
10
11     for (int i = 0; i < n; i++)
12     {
13         cin >> ar[i];
14     }
15
16     cout << "You entered ";
17     for (int i = 0; i < n; i++)
18     {
19         cout << ar[i] << ", ";
20     }
21 }
```

And this is result:

PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL    PORTS

```
PS D:\C++\Lab\WEEK 5> cd "d:\C++\Lab\WEEK 5\" ; if ($?) {
Enter the number of elements you want in the array
7
Enter the elements of the array
3
6
2
59
4
87
1
You entered 3, 6, 2, 59, 4, 87, 1,
PS D:\C++\Lab\WEEK 5> █
```

## #2 Write a C++ program to find the sum of the all-array element.

This is the required code:

```
1  #include <iostream>
2  using namespace std;
3  int main()
4  {
5      int n,sum=0;
6      cout<<"Enter the number of elements you want in the array\n";
7      cin>>n;
8      int ar[n];
9      cout<<"Enter the of elements in the array\n";
10
11     for (int i = 0; i < n; i++)
12     {
13         cin>>ar[i];
14         sum=sum+ar[i];
15     }
16     cout<<"The sum of all elements :"<<sum;
17
18 }
```

And this is result:

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS D:\C++\Lab\WEEK 5> cd "d:\C++\Lab\WEEK 5\" ; if ($?)
Enter the number of elements you want in the array
7
Enter the of elements in the array
3
2
8
6
41
25
32
The sum of all elements :117
PS D:\C++\Lab\WEEK 5> █
```

### #3 Write a C++ program to find the length of the array.

This is the required code:

```
1  #include <iostream>
2  using namespace std;
3  int main()
4  {
5      int arr[] = {10, 20, 30, 40, 50, 60};
6      int arrSize = sizeof(arr) / sizeof(arr[0]);
7      cout << "The size of the array is: " << arrSize;
8      return 0;
9  }
```

And this is output:

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL    |
PS D:\C++\Lab\WEEK 5> cd "d:\C++\Lab\WEEK 5\"
The size of the array is: 6
PS D:\C++\Lab\WEEK 5>
```

### #4 Write a C++ program to find the second-largest integer in a list of integers. This is the required program:

```
#include <iostream>
using namespace std;
// finding the second largest number in the array : running
int findSecondLargest(int arr[], int size)
{
    int largest = arr[0];
    int secondLargest = arr[0];
    for (int i = 1; i < size; ++i)
    {
        if (arr[i] > largest)
        {
            secondLargest = largest;
            largest = arr[i];
        }
    }
}
```

```

    }
    else if (arr[i] > secondLargest && arr[i] != largest)
    {
        secondLargest = arr[i];
    }
}
return secondLargest;
}

int main()
{
    cout << "Enter the number of elements you want in the
array: ";
    int n;
    cin >> n;
    int arr[n];
    cout<<"Enter the elements\n";
    for (int i = 0; i < n; i++)
    {
        cin>>arr[i];
    }
    int secondLargest = findSecondLargest(arr, n);
    cout << "The second largest element is: " << secondLargest
<< endl;
    return 0;
}

```

And this is the result of the program:

```

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS D:\C++\Lab\WEEK 5> cd "d:\C++\Lab\WEEK 5\" ; if ($?)
Enter the number of elements you want in the array: 7
Enter the elements
3
1
9
5
9
4
9
The second largest element is: 5

```

**#5 Write a C++ Program to reverse the position of the array element (Hint: First element to the last element.)**

This is the required program:

```
1  #include <iostream>
2  using namespace std;
3  int main()
4  {
5      int n;
6      cout << "Enter the number of elements you want in the array\n";
7      cin >> n;
8      int ar[n];
9      cout << "Enter the of elements in the array\n";
10
11     for (int i = 0; i < n; i++)
12     {
13         cin >> ar[i];
14     }
15     cout << "The reverse elements are: \n";
16
17     for (int i = n - 1; i >= 0; i--)
18     {
19         cout << ar[i] << endl;
20     }
21 }
```

And this is the result:

PROBLEMS	OUTPUT	DEBUG CONSOLE	TERMINAL	PORTS
PS D:\C++\Lab\WEEK 5> cd "d:\C++\Lab\WEEK 5\" ; if				
Enter the number of elements you want in the array				
6				
Enter the of elements in the array				
2				
3				
6				
95				
48				
1				
The reverse elements are:				
1				
48				
95				
6				
3				
2				

**#6 Write a C++ program to perform the following:**

**a. Addition of two matrices.**

**b. Multiplication of two matrices.**

```
#include <iostream>
using namespace std;
// addition and multiplication of two matrices: running
int main()
{
    int rows1, cols1, rows2, cols2;
    cout << "Enter the number of rows and columns of first
matrix: ";
    cin >> rows1 >> cols1;

    int matrix1[rows1][cols1];

    cout << "Enter the elements of first matrix:\n";
    for (int i = 0; i < rows1; i++)
    {
        for (int j = 0; j < cols1; j++)
        {
            cin >> matrix1[i][j];
        }
    }

    cout << "Enter the number of rows and columns of second
matrix: ";
    cin >> rows2 >> cols2;

    // checking condition for multiplication
    if (cols1 != rows2)
    {
        cout << "Invalid input! Number of columns of first
matrix should be equal to number of rows of second matrix.";
        return 0;
    }

    int matrix2[rows2][cols2];
    cout << "Enter the elements of second matrix:\n";
```

```

    for (int i = 0; i < rows2; i++)
    {
        for (int j = 0; j < cols2; j++)
        {
            cin >> matrix2[i][j];
        }
    }
    // product logic
    int product[rows1][cols2];

    for (int i = 0; i < rows1; i++)
    {
        for (int j = 0; j < cols2; j++)
        {
            product[i][j] = 0;
            for (int k = 0; k < cols1; k++)
            {
                product[i][j] += matrix1[i][k] * matrix2[k][j];
            }
        }
    }
    // printing products
    cout << "The product of both matrices is:\n";
    for (int i = 0; i < rows1; i++)
    {
        for (int j = 0; j < cols2; j++)
        {
            cout << product[i][j] << " ";
        }
        cout << "\n";
    }

    // checking condition for addition
    if (rows1 != rows2 || cols1 != cols2)
    {
        cout << "Sum is not possible, the number of rows and
columns of both matrices should be same\n";
        return 0;
    }

```

```

// sum logic
int sum[rows1][cols1] = {0};
for (int i = 0; i < rows1; i++)
{
    for (int j = 0; j < cols1; j++)
    {
        sum[i][j] = matrix1[i][j] + matrix2[i][j];
    }
}

// printing sum
cout << "The sum of both matrices is\n";

for (int i = 0; i < rows1; i++)
{
    for (int j = 0; j < cols1; j++)
    {
        cout << matrix1[i][j] + matrix2[i][j] << " ";
    }
    cout << endl;
}
}

```



And this is output:

```
Enter the number of rows and columns of first matrix: 3 3
3
Enter the elements of first matrix:
5
6
4
3
9
8
2
1
7
Enter the number of rows and columns of second matrix: 3 3
3
Enter the elements of second matrix:
2
6
5
4
9
1
8
7
4
The product of both matrices is:
66 112 47
106 155 56
64 70 39
The sum of both matrices is
7 12 9
7 18 9
10 8 11
```

**#7 Write a C++ program to count and display positive, negative, odd and even numbers in an array.**

This is the required program:

```
#include <iostream>
using namespace std;
int main()
{
    int i, n, j, cp = 0, cn = 0, ce = 0, co = 0;
    cout << "Enter the number of elements of array: ";
    cin >> n;
    cout << "Enter the elements of the array\n";
    int arr[n], parr[n] = {0}, narr[n] = {0}, oddarr[n] = {0},
evenarr[n] = {0};
    for (i = 0; i < n; i++)
        cin >> arr[i];

    for (i = 0; i < n; i++)
    {
        if (arr[i] > 0)
        {
            cp++;
        }
        else
        {
            cn++;
        }

        if (arr[i] % 2 == 0)
        {
            ce++;
        }
        else
        {
            co++;
        }
    }
    cout << "Total positive numbers are: " << cp;
    cout << "\nTotal negative numbers are: " << cn;
```

```
    cout << "\nTotal even numbers are: " << ce;  
    cout << "\nTotal odd numbers are: " << co;  
}
```

And this is the result:

```
PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL  
  
PS D:\C++\Lab\WEEK 5> cd "d:\C++\Lab\WEEK 5\  
Enter the number of elements of array: 6  
Enter the elements of the array  
-5  
9  
-7  
3  
5  
8  
Total positive numbers are: 4  
Total negative numbers are: 2  
Total even numbers are: 1  
Total odd numbers are: 5  
PS D:\C++\Lab\WEEK 5> █
```

**#8** Write a C++ program to merge two sorted arrays into another array in sorted order.

This is the required code:

```
#include <iostream>  
using namespace std;  
int sort(int arr[], int len)  
{ // sorting logic  
    for (int i = 0; i < len; i++)  
    {  
        for (int j = i + 1; j < len; j++)  
        {  
            if (arr[i] < arr[j])  
            {  
                int x = arr[i];  
                arr[i] = arr[j];  
                arr[j] = x;  
            }  
        }  
    }  
}
```

```

    }
}
return arr[len];
}
int main()
{
    int m, n, x;
    cout << "Enter the number of elements of the array 1\n";
    cin >> m;
    int ar1[m];
    cout << "Enter the elements of array 1\n";
    for (int i = 0; i < m; i++)
        cin >> ar1[i];

    ar1[m] = sort(ar1, m);
    int mergArray[m + n] = {0};
    for (int i = 0; i < m; i++)
        mergArray[i] = ar1[i];

    cout << "Enter the number of elements of the array 2\n";
    cin >> n;
    int ar2[n];
    cout << "Enter the elements of array 2\n";
    for (int i = 0; i < n; i++)
        cin >> ar2[i];

    ar2[n] = sort(ar2, n);
    for (int i = m; i < n + m; i++)
        mergArray[i] = ar2[i-m];

    cout << "Sorted array 1\n";
    for (int i = 0; i < m; i++)
        cout << ar1[i] << " ";

    cout << "\nSorted array 2\n";
    for (int i = 0; i < n; i++)
        cout << ar2[i] << " ";

    cout << "\nMerged and sorted Array\n";

```

```

    mergArray[m+n] = sort(mergArray,m+n);
    for (int i = 0; i < m + n; i++)
        cout << mergArray[i] << "    ";
}

```

And this the result:

```

PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

PS D:\C++\Lab\WEEK 5> cd "d:\C++\Lab\WEEK 5\" ; if
Enter the number of elements of the array 1
5
Enter the elements of array 1
3
2
9
45
1
Enter the number of elements of the array 2
7
Enter the elements of array 2
2
5
6
86
4
12
47
Sorted array 1
45 9 3 2 1
Sorted array 2
86 47 12 6 5 4 2
Merged and sorted Array
86  47  45  12  9  6  5  4  3  2  2  1
PS D:\C++\Lab\WEEK 5> █

```

**#9** Write a C++ program to find the frequency of a particular number in a list of integers.

This the the required code:

```
#include <iostream>
using namespace std;
int main()
{
    int n, ch, count = 0;
    cout << "Enter the number of element of array\n";
    cin >> n;

    int arr[n];
    cout << "Enter array elements\n";
    for (int i = 0; i < n; i++)
        cin >> arr[i];

    cout << "Enter the number for which you want to check
frequency: ";

    cin >> ch;

    for (int i = 0; i < n; i++)
    {
        if (ch == arr[i])
        {
            count++;
        }
    }
    cout<<"The frequency of "<<ch<<" is "<<count;
}
```

And this is the result:

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS D:\C++\Lab\WEEK 5> cd "d:\C++\Lab\WEEK 5\" ; if ($?) {
Enter the number of element of array
9
Enter array elements
3
6
5
3
2
1
6
9
8
Enter the number for which you want to check frequency: 3
The frequency of 3 is 2
PS D:\C++\Lab\WEEK 5> █
```