Exercises for Laboratory Work 5

The topic of the laboratory work 5: Two-dimensional arrays.

The aim of the laboratory work 5: to write a program in C++ using two-dimensional arrays, loop for; to input values of array elements of from the keyboard (or assign values of array elements) and to display the result of the program on the screen.

Exercises:

Write a C++ program to solve a task with two-dimensional arrays.

1. Given an array A (5,5). Find the minimum among the elements in the odd rows of the array and the smallest element of the array (minimum).
2. Given an array A (7,7). Find the product and the number of positive elements, located above the main diagonal.
3. Given an array A (4,4). Find the sum of positive elements, located below the main diagonal and the smallest element of the array (minimum).
4. Given an array A (6,6). Find the product of positive elements, located on the main diagonal.
5. Given an array A (5,5). Find the sum of negative elements, located above the main diagonal and the smallest element of the array (minimum).
6. Given an array A (7,7). Find the product of negative element, located not on the main diagonal and the greatest element of the array (maximum).
7. Given an array A (3,3). Find the minimum element among elements arranged in the odd rows of the array and the smallest element of the array (minimum).
8. Given an array A (7,7). Find a product and the number of positive elements, located above the main diagonal and the greatest element of the array (maximum).
9. Given an array A (4,4). Find the sum of positive elements and the smallest element of the array (minimum).
10. Given an array A (8,8). Find the product of positive elements, located above the main diagonal and the greatest element of the array (maximum).
11. Given an array A (5,5). Find the sum of negative elements and the greatest element (maximum).
12. Given an array A (7,7). Find the product of negative elements, located above the main diagonal and the smallest element of the array (minimum).
13. Given an array A (6,6). Find the minimum among the elements in the odd rows of the array and located above the main diagonal.
14. Given an array A (8,8). Find the sum and the number of positive elements, located below the main diagonal the smallest element of the array (minimum).
15. Given an array A (5,5). Find the sum of positive odd elements, located below the main diagonal and the greatest element of array.

16. Given an array A (7,7). Find the product and the sum of positive elements, located on the main diagonal and the smallest element of array (minimum).

17. Given an array A (5,5). Find the sum of negative elements, located above the main diagonal and the greatest element of array.

18. Given an array A (7,7). Find the product of negative element, located not on the main diagonal and the smallest element of the array.

19. Given an array A (3,3). Find the minimum element among elements arranged in the odd rows of the array the sum of positive elements.

20. Given an array A (9,9). Find a product and the number of positive elements, located above the main diagonal and the smallest element of the array and the smallest element of the array (minimum).

5.4 Examples:

Example 1.

Given an array A (5,5). Find the sum of not odd elements of the array.

Solution:

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

int main(){
    int a[5][5] = { {1,2,1,8,1},
                    {4,1,6,1,1},
                    {1,20,1,9,1},
                    {1,7,1,1,1},
                    {1,1,18,15,1}
                    };
    int i,j;
    int sum=0;

    for( i=0; i<5; i++)
    for(j=0; j<5; j++){
       if((a[i][j] % 2) == 0 ){
       sum = sum + a[i][j];
          }
       }

for ( i=0; i<5;i++)
{    for ( j=0; j<5;j++)
{ cout << a[i][j]<< " ";
}
cout <<endl;
}
```

```
        cout<<endl;
         cout <<sum;
         return 0;
}
```

Run the program and you will see on the screen of monitor:

```
1 2 1 8 1
4 1 6 1 1
1 20 1 9 1
1 7 1 1 1
1 1 18 15 1
58
```

Example 2. Given an array A (5,5). Find the product of negative odd elements, located below the main diagonal and the greatest element of array.

Solution:

```
#include<iostream>
#include<math.h>
using namespace std;

int main(){
   int  product=1;

     int a[5][5]={{8,-1, 7, 5, 8},
                  { -1, 1, -1, 2, 3},
                  { 1, 1, -1, 2, 3},
                  { 2, 1, -1, 2, 3},
                  { -5, 1, 0, 0, 0 }};


// block to output elements of array
    for(int i=0; i<5; i++)
    {
        for(int j=0; j<5; j++)
    {
     cout << a[i][j]<< " ";
}
cout <<endl;
}

// block to find the product of negative odd elements of array
that lie below the main diagonal
for(int i=0; i<5; i++)
for(int j=0; j<5; j++)
```

```
if     ((a[i][j]<0)     &&     (a[i][j]!=0)     &&     (i>j))
product=product*a[i][j]; //  condition
cout<< "  product="<<product;
}
```

Run the program and you will see on the screen of monitor:


```
8 -1 7 5 8
-1 1 -1 2 3
1 1 -1 2 3
2 1 -1 2 3
-5 1 0 0 0
  product=-5
```