6.3 Exercises for Laboratory Work 6

The topic of the laboratory work 6: Two-dimensional arrays. Tasks for each row and for each column of a two-dimensional array.
The aim of the laboratory work 6: 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 results of the program on the screen.

Exercises:
Write a C++ program for solving this task with two-dimensional arrays.
1. Given an array A (5,5). Find the sum of negative odd elements and the greatest element (maximum) of each row of two-dimensional array.
2. Given an array A (7,7). Find the product of even negative elements and the greatest element (maximum) of each column of the two-dimensional array.
3. Given an array A (3,3). Find the minimum element and the greatest element (maximum) of each row of two-dimensional array.
4. Given an array A (7,7). Find a product and the number of positive elements of each column of the two-dimensional array.
5. Given an array A (4,4). Find the sum of even positive elements and the smallest element (minimum) of each row of two-dimensional array.
6. Given an array A (8,8). Find the number of positive elements and the greatest element (maximum) of each column two-dimensional array.
7. Given an array A (5,5). Find the sum of even negative elements and the greatest element (maximum) of each column of two-dimensional array.
8. Given an array A (7,7). Find the number of negative elements and the greatest element (maximum) of each column of two-dimensional array.
9. Given an array A (5,5). Find the minimum and the greatest element (maximum) of each row of two-dimensional array.
10. Given an array A (7,7). Find the product and the number of negative elements of each row of two-dimensional array.
11. Given an array A (4,4). Find the sum of even positive elements and the greatest element (maximum) of each column of the dimensional array.
12. Given an array A (6,6). Find the product of positive elements and the greatest element (maximum) of each row of the dimensional array.
13. Given an array A (4,4). Find the sum of odd elements and the greatest element (maximum) of each column of two-dimensional array.
14. Given an array A (5,5). Find the product of even negative elements and the greatest negative element of each column of the two-dimensional array.
15. Given an array A (3,3). Find the minimum even positive element and the greatest negative element (maximum) of each row of two-dimensional array.
16. Given an array A (6,6). Find a sum and the number of positive elements of each column of two-dimensional array.
17. Given an array A (5,5). Find the product of positive odd elements and the smallest element (minimum) of each row of two-dimensional array.

18. Given an array A (8,8). Find the number of even negative elements and the greatest element (maximum) of each row of two-dimensional array.
19. Given an array A (6,6). Find the product of odd negative elements and the greatest element (maximum) of each column of two-dimensional array.
20. Given an array A (7,7). Find the number of odd negative elements and the greatest element (maximum) of each column of two-dimensional array.

6.4Examples

Example 1.Given an array A (3,3). Find the number of even negative elements of each column of two-dimensional array.

Solution:

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

int main(){
   int  number;

     int a[3][3]={{-8,-6, 8},
                  { -4, -2, -7},
                  { 3, -2, 9 }};



cout <<"Array:"<<endl;
// block to output elements of array a
     for(int i=0; i<3; i++)
     {
          for(int j=0; j<3; j++)
     {
      cout << a[i][j]<< "  ";
}
cout <<endl;
}
cout <<endl;

//block for each column of a matrix
for (int j = 0; j < 3; j++)
{number=0;
for (int i = 0; i< 3; i++)
{ if ((a[i][j]) <0 &&  (a[i][j]%2==0))
number =number+1 ;
}
cout <<"Number of "<<j<< " column= "<< number << "  ";
```

```
cout <<endl;
}
}
```

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

```
Array:
-8  -6   8
-4  -2  -7
 3  -2   9

Number of 0 column= 2
Number of 1 column= 3
Number of 2 column= 0
```

6.5 Additional exercises

Exercise 1.

Write a C++ program that forms a matrix B[10, 10], using loops, from a matrix A[10,10].

A[10,10]:

1	1	1	1	1	2	2	2	2	2
1	1	1	1	1	2	2	2	2	2
1	1	1	1	1	2	2	2	2	2
1	1	1	1	1	2	2	2	2	2
1	1	1	1	1	2	2	2	2	2
3	3	3	3	3	4	4	4	4	4
3	3	3	3	3	4	4	4	4	4
3	3	3	3	3	4	4	4	4	4
3	3	3	3	3	4	4	4	4	4
3	3	3	3	3	4	4	4	4	4
3	3	3	3	3	4	4	4	4	4

B[10, 10] :

4	4	4	4	4	3	3	3	3	3
4	4	4	4	4	3	3	3	3	3
4	4	4	4	4	3	3	3	3	3
4	4	4	4	4	3	3	3	3	3
4	4	4	4	4	3	3	3	3	3
2	2	2	2	2	1	1	1	1	1
2	2	2	2	2	1	1	1	1	1
2	2	2	2	2	1	1	1	1	1
2	2	2	2	2	1	1	1	1	1
2	2	2	2	2	1	1	1	1	1
2	2	2	2	2	1	1	1	1	1

Exercise 2.

Write a C++ program that forms a matrix B[5,5] from a matrix A[5,5], using loops.

A[5,5]:

1	2	3	4	5
6	1	2	3	4
7	6	1	2	3
8	7	6	1	2
9	8	7	6	1

B[5,5]:

1	6	7	8	9
2	1	6	7	8
3	2	1	6	7
4	3	2	1	6
5	4	3	2	1

Exercise 3.

Write a C++ program that forms a matrix B[5,5] from a matrix A[5,5], using loops.

A[5,5]:

```
1  2  3  4  5
2  3  4  5  6
3  4  5  6  7
4  5  6  7  8
5  6  7  8  9
```

B[5,5]:

```
9  8  7  6  5
8  7  6  5  4
7  6  5  4  3
6  5  4  3  2
5  4  3  2  1
```

Exercise 4.

Write a C++ program that forms a matrix A[5,5], using loops.

```
1  1  1  1  1
1  2  2  2  1
1  2  3  2  1
1  2  2  2  1
1  1  1  1  1
```

Exercise 5.

Write a C++ program that forms a matrix A, using loops, like in the Exercise 4, but you must input any dimension from the keyboard.

Exercise 6.

Write a C++ program that forms a matrix A[5,5], using loops.

```
0  0  1  0  0
0  0  1  0  0
1  1  1  1  1
0  0  1  0  0
0  0  1  0  0
```

Exercise 7.

Write a C++ program that forms a matrix A[5,5], using loops.

```
1  0  1  0  1
0  1  1  1  0
1  1  1  1  1
0  1  1  0  1
1  0  1  0  1
```