Max Funds

Problem Description

An NGO wants to arrange funds for flood relief. It has divided volunteers into groups. A volunteer can only be a part of single group. Your task is to find the maximum funds collected by a group.

You will be given the funds collected by each volunteer and grouping pairs of the volunteers. You need to group the volunteers through these pairs.

Constraints

0 < N, P <= 10000

0 < A, B <= N

Input

First line contains one integer N, denoting number of volunteers.

Second line contains N space separated integers, representing the amount collected by each volunteer. The index of integer is the volunteer number starting from 1.

Third line contains the number of pairs, P.

Next P lines contain two space separated integers, A and B where A represents the first person and B represents the second person in the pair.

Output

One line containing an integer, representing the maximum funds collected by the group.

Time Limit

2

Examples

Example 1

Input

5

23 43 123 54 2

3

1 3

2 3

1 2

Output

189

Explanation

In the above example, we have five volunteer [1, 2, 3, 4, 5] who have collected [23, 43, 123, 54, 2] respectively.

We have three groups that consists of [1, 2, 3], [4], [5]. First group collects 189 units of money, second group collects 54 units of money and third group collects 2 units of money. The maximum funds collected by any group is 189. Hence, the output is 189

Example 2

Input

9

34 54 65 76 88 23 56 76 43

7

1 3

2 3

1 2

6 8

5 4

5 7

8 9

Output

220

Explanation

In the above example, we have three groups that consists of [1, 2, 3], [4, 5, 7], [6, 8, 9]. Each group collects 153, 220, 142 units of money respectively. The maximum funds collected by a group is 220. Hence the output is 220.

Infected Cells

Problem Description

An animal has an infected tissue; the tissue is infected by a virus. The virus is activated only at a pH value of 6.

John, a veterinary doctor, suspects all the cells to be infected and hence, have a pH value of 6. However he needs to confirm his suspicion with the help of a specialized machine which finds the pH value of cells in the tissue.

The machine finds the pH value and returns the number of virus infected spots. If the adjacent cells are of same pH and they form either square or a rectangle then and only then the said infected cells will be counted as 1 infected spot. Thus it is easy to see that the infected spots can be of different sizes. (Refer Examples for better clarity)

The machine first scans the infected cells in row order and determines the number of infected spots. Then scans the infected cells in column order and determines the number of infected spots and returns the minimum of the two counts. (Refer Example 2 for better understanding)

The tissue will be given in the form of a matrix. Every element of the matrix provides the pH value of the cell.

You need to find the infected spots as determined by the machine. An infected spot as explained earlier consists of one or more cells which form a rectangle or a square relative to the direction of the scan.

Constraints

0 < R, C <= 10000

Input

First line contains two integers R and C, where R represents number of rows and C represents number of columns. Next R lines contain C space separated integers, representing the pH values.

Output

One line containing an integer, representing the number of infected spots in the tissue determined by the machine.

Time Limit

3

Examples

Example 1

Input

3 3
0 6 6
9 6 6
9 7 4

3 3

0 6 6

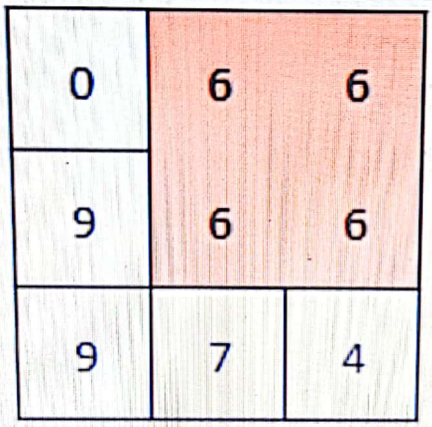
9 6 6

9 7 4

Output

1

Explanation



There will only be 1 infected spot as determined by both ways of scanning. Hence the machine will return 1. Hence, the output is 1.

Example 2

Input

5 4

6 6 6 6

3 6 4 6

6 6 6 6

3 6 4 6

6 6 6 6

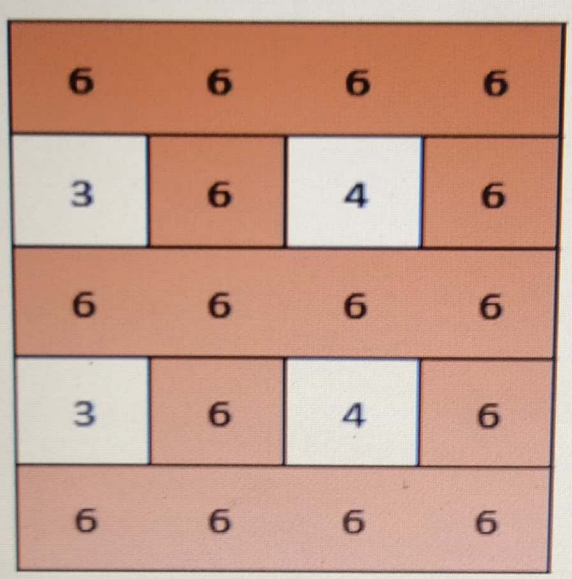
6 6 6 6

Output

7

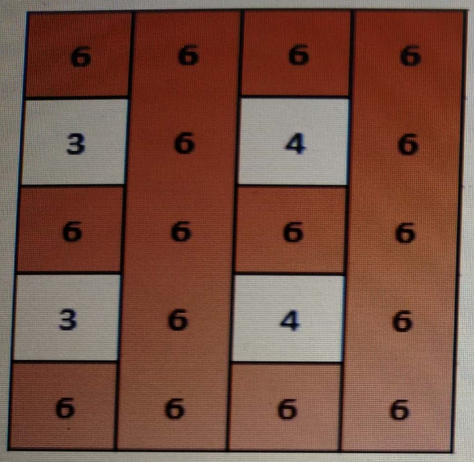
Explanation

For row based scanning the number of infected spots is 7 as depicted below.



Similarly, for column based scanning the number of infected spots is 8 as depicted below

Similarly, for column based scanning the number of infected spots is 8 as depicted below



Since, row based scanning count is less than column based scanning count, the machine will return the number of infected spots as 7. Hence, the output is 7.