L-paths in a Matrix

In this problem, we consider integer square matrices consisting of $N \times N$ cells. The indices of the rows and the columns of a matrix are $0,1,2, \ldots, N-1$.
Two cells in a matrix are **neighbours** if they are in the same row or in the same column and either their row coordinates differ by 1 or their column coordinates differ by 1.
A cell in the matrix interior has four neighbour cells, a cell in the corner of a matrix has two neighbour cells and a cell at the border of the matrix and not in the corner has three neighbour cells.

An **L-path** in a matrix is a set LP of cells with the following properties:

- 1. All cells in LP contain the same value.
- 2. Any cell which is not in LP and which is a neighbour of some cell in LP contains a different value from the value of cells in LP.
- 3. There is one specific cell D in LP with coordinates $[r, c]$ such that exactly one of the four following conditions is satisfied:
  - 3.1. All cells with coordinates $[r-1, c], [r-2, c], \ldots, [0, c]$ and $[r, c+1], [r, c+2], \ldots, [r, N-1]$ are in LP.
  - 3.2. All cells with coordinates $[r-1, c], [r-2, c], \ldots, [0, c]$ and $[r, c-1], [r, c-2], \ldots, [r, 0]$ are in LP.
  - 3.3. All cells with coordinates $[r+1, c], [r+2, c], \ldots, [N-1, c]$ and $[r, c-1], [r, c-2], \ldots, [r, 0]$ are in LP.
  - 3.4. All cells with coordinates $[r+1, c], [r+2, c], \ldots, [N-1, c]$ and $[r, c+1], [r, c+2], \ldots, [r, N-1]$ are in LP.
- 4. No other cells in the matrix than those specified in 3. are part of LP.
- 5. LP consists of at least 3 cells.

The **value of an L-path** is the sum of values in all its cells.
The **L-value of a matrix** is the sum of all values of L-paths in the matrix. If there is no L-path in the matrix, the L-value of the matrix is defined to be 0.

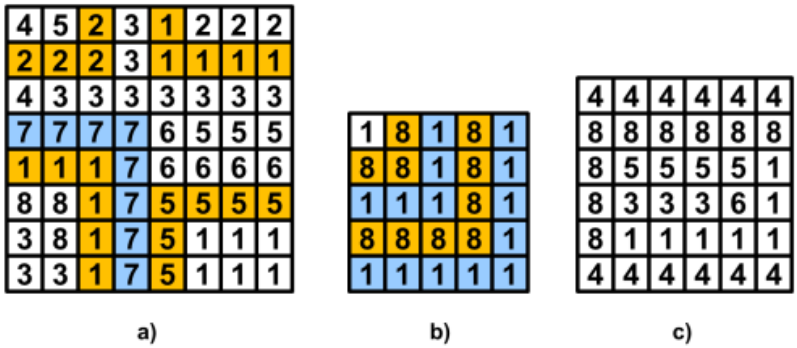

Image 1. Examples of matrices with all L-paths highlighted in orange and blue. The case a) correspond to Example 1, the case b) correspond to the first matrix in Example 2 and the case c) corresponds to the second matrix in Example 3 below. Note that the matrix in case c) contains no L-path.

The task

Determine L-value of each input matrix.

Input

The first input line contains two integer N and K. Integer N specifies the size of all matrices in the input. Integer K specifies the number of matrices in the input.
Next, there are exactly K matrices of size $N \times N$ occupying $K \times N$ lines. First N lines specify the first matrix, next N lines specify the second matrix and so on. Each line contains N values, the values correspond to the values in a particular row in the current matrix. All values are separated by single space.
It holds $1 \leq N, K \leq 100$, all values in all matrices are positive integers less than 100.

Output

The output contains as many text line as there are matrices in the input. Each line contains the L-value of the corresponding matrix. The order of the output values is the same as the order of the input matrices.

Example 1

Input

Example 2

Input

Example 3

Input

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

Output

```
105
```

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

Output

```
94
39
16
```

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

Output

```
12
0
```

Public data

The public data set is intended for easier debugging and approximate program correctness checking. The public data set is stored also in the upload system and each time a student submits a solution it is run on the public dataset and the program output to stdout and stderr is available to him/her.
Link to public data set