

Contest Duration: 2025-07-05(Sat) 22:00 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250705T2100&p1=248>) - 2025-07-05(Sat) 23:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250705T2240&p1=248>) (local time) (100 minutes)

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Time Limit: 2.5 sec / Memory Limit: 1024 MiB

Score : 525 points

Problem Statement

There is an $H \times W$ grid. Let (i, j) denote the cell at the i -th row from the top and j -th column from the left. Among these, K cells are goals. The i -th goal ($1 \leq i \leq K$) is cell (R_i, C_i) .

Takahashi and Aoki play a game using this grid and a single piece placed on the grid.

Takahashi and Aoki repeatedly perform the following series of operations until the piece reaches a goal cell:

- Aoki chooses an integer a between 1 and 4, inclusive.
- Then, Takahashi chooses an integer b between 1 and 4, inclusive, where $a \neq b$ must be satisfied. Let (i, j) be the cell where the piece is placed before the operation. Based on the chosen integer b and the piece's position, move the piece.
 - When $b = 1$: If $(i - 1, j)$ is within the grid, move the piece from cell (i, j) to cell $(i - 1, j)$; if it is outside the grid, do nothing.
 - When $b = 2$: If $(i + 1, j)$ is within the grid, move the piece from cell (i, j) to cell $(i + 1, j)$; if it is outside the grid, do nothing.
 - When $b = 3$: If $(i, j - 1)$ is within the grid, move the piece from cell (i, j) to cell $(i, j - 1)$; if it is outside the grid, do nothing.
 - When $b = 4$: If $(i, j + 1)$ is within the grid, move the piece from cell (i, j) to cell $(i, j + 1)$; if it is outside the grid, do nothing.

Takahashi's objective is to minimize the number of moves until the piece reaches a goal.

Aoki's objective is to prevent the piece from reaching the goal; if that is impossible, his objective is to maximize the number of moves until the piece reaches a goal.

For all pairs of integers (i, j) satisfying $1 \leq i \leq H, 1 \leq j \leq W$, solve the following problem and find the sum of all solutions:

Start the game with the piece at cell (i, j) . Assume both players act optimally toward their respective objectives. If Takahashi can make the piece reach a goal, the solution is the minimum number of moves; otherwise, the solution is 0.

Constraints

- $2 \leq H \leq 3000$
- $2 \leq W \leq 3000$
- $1 \leq K \leq \min(HW, 3000)$
- $1 \leq R_i \leq H$
- $1 \leq C_i \leq W$
- $(R_i, C_i) \neq (R_j, C_j) (1 \leq i < j \leq K)$
- All input values are integers.

Input

The input is given from standard input in the following format:

```
H  W  K
R1  C1
R2  C2
:
RK  CK
```

Output

Print the answer.

Sample Input 1

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05:26:41 +11:00

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

Sample Output 1

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```
2
```

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When $(i, j) = (1, 2), (2, 1)$, the starting cell is a goal, so the solution is 0.

When $(i, j) = (1, 1), (2, 2)$, no matter which a Aoki chooses, Takahashi can make the piece reach a goal in 1 move from the starting cell, so the solution is 1.

When $(i, j) = (1, 3), (2, 3)$, Takahashi cannot reach a goal, so the solution is 0.

The sum of these is $0 \times 2 + 1 \times 2 + 0 \times 2 = 2$. Thus, print 2.

Sample Input 2

[Copy](#)

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

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Sample Output 2

[Copy](#)

```
43
```

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Sample Input 3

[Copy](#)

[Copy](#)

```
10 10 36
3 8
5 10
3 10
6 10
2 10
2 8
7 10
1 10
1 8
7 6
7 8
2 5
1 6
8 8
7 5
2 4
9 8
7 4
4 3
10 10
10 8
8 10
10 6
6 2
4 2
10 5
8 3
1 2
2 1
4 1
10 4
10 3
8 1
6 1
10 2
9 1
```

Sample Output 3

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153

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