A1. Fire tower 3D (easy version)

Difficulty: Easy **Time**: 3 s **Memory**: 1024 MB

by shcal

Note: the only difference between the easy and hard versions of this problem is that in the easy version, $d \le 100$ and $n, m, nm, k \le 10^4$, while in the hard version, $d \le 10^{12}$ and $n, m, nm, k \le 10^6$.

authentic photograph of a real-life situation

It's the night before ICPC World Finals 2025 and the Purdue Waffle Wizards are playing their favorite board game: Fire Tower 3D. In retrospect, they would have solved more problems if they went to bed, but they can't rest until they know the outcome. Now that they've procured a time travel machine, all they need is for you to simulate the game!

Fire Tower 3D is played on an $n \times m$ grid (n rows, m columns). Each cell can contain fire, which can also grow upward. Each day, these steps happen in order:

1. Every cell containing fire *simultaneously* spawns a fire of height 1m in each adjacent cell (sharing an edge and inside the grid) that does not already contain fire.
2. After that, the tower of fire in each cell grows upward by 1m.

Given the initial positions of k fires with height 1m, what's the total height in meters of all fires on the grid after d days?

Input

The first line contains 4 integers n, m, k, d ($1 \le n, m, nm \le 10^4$, $1 \le k \le nm$ and $1 \le d \le 100$).

The i-th of the next k lines contains two integers r_i, c_i with $1 \le r_i \le n$ and $1 \le c_i \le m$: the row and column of the i-th initial fire, respectively. All initial fires are distinct; no pair (r_i, c_i) is repeated.

Output

Output a single number: the total height in meters of all fires after d days.

Sample 1

Input

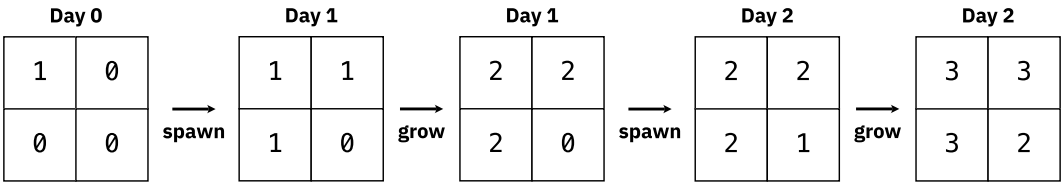
```
2 2 1 2
1 1
```

Output

```
11
```

Explanation

You can see the day-by-day process in the diagram on the next page. The number in each cell represents the height of the fire in that cell or 0 if the fire has not reached this cell yet.



After 2 days, the sum of the heights of fires is $3 + 3 + 3 + 2 = 11$, so the answer is 11.

Sample 2

Input

```
1 5 1 10
1 3
```

Output

```
53
```

Sample 3

Input

```
4 3 6 6
1 1
2 2
3 1
3 3
4 1
4 2
```

Output

```
83
```