Problem E. Experience is Worth It

Input file:	*standard input*
Output file:	*standard output*
Time limit:	5 seconds
Memory limit:	256 mebibytes

Pasha is playing the video game "DiaBro III". He is fighting against $n \cdot m$ monsters in this game. The monsters are arranged into n rows of m columns each. Rows are numbered with sequential integers from 1 to n and columns — with sequential integers from 1 to m.

Each monster has one of k types. The i-th monster type is described by two integers q_i and g_i: Pasha can kill a monster of i-th type only if amount of his experience is at least q_i, and after killing each monster of this type — Pasha will gain g_i units of experience.

Pasha wants to choose a rectangle by fixing four integers r_1, r_2, c_1 and c_2 such that $1 \le r_1 \le r_2 \le n$ and $1 \le c_1 \le c_2 \le m$. Then Pasha starts to kill monsters in the chosen rectangle — at cells (r, c) such that $r_1 \le r \le r_2$ and $c_1 \le c \le c_2$. Initially, he has no experience at all. The rectangle is *good* if it is possible to kill all monsters inside the rectangle in some order without killing any monster which is not in the rectangle.

You are to write a program that will find the number of different *good* rectangles.

Input

The first line of input contains two integers n and m ($1 \le n, m \le 200$) — the number of rows and columns of monsters respectively.

Each of the following n lines contains exactly m lowercase Latin letters. The j-th character of i-th line denotes the type of monster with row number i and column number j. Monsters of the same type are denoted with the same lowercase Latin letter.

The next line contain the only integer k ($1 \le k \le 26$) — the number of monster types.

Each of the following k lines contains the description of some monster type. The description of i-th monster type consists of character l_i — the lowercase Latin letter corresponding to this monster type — and two integers q_i and g_i ($0 \le q_i \le 10^9, 1 \le g_i \le 10^9$) — the amount of experience required to kill a monster of this type and the amount of experience obtained after killing each monster of this type respectively. The values of l_i, q_i and g_i are separated by single spaces.

It is guaranteed that there is no monster of type that is not described in the input.

Output

The only line of output should contain one integer — the number of ways to choose values r_1, r_2, c_1 and c_2 to satisfy all the conditions given above.

Examples

standard input	standard output
2 3 aba baa 2 a 0 2 b 4 100	11
4 6 aaaaaa abbaaa aaacba aaabba 3 a 0 1 b 3 2 c 12 5	128

Note

There are 11 possible values of r_1, r_2, c_1 and c_2 in the first sample:

1. $r_1 = 1, \quad r_2 = 1, \quad c_1 = 1, \quad c_2 = 1;$
2. $r_1 = 1, \quad r_2 = 1, \quad c_1 = 1, \quad c_2 = 3;$
3. $r_1 = 1, \quad r_2 = 1, \quad c_1 = 3, \quad c_2 = 3;$
4. $r_1 = 1, \quad r_2 = 2, \quad c_1 = 1, \quad c_2 = 2;$
5. $r_1 = 1, \quad r_2 = 2, \quad c_1 = 1, \quad c_2 = 3;$
6. $r_1 = 1, \quad r_2 = 2, \quad c_1 = 2, \quad c_2 = 3;$
7. $r_1 = 1, \quad r_2 = 2, \quad c_1 = 3, \quad c_2 = 3;$
8. $r_1 = 2, \quad r_2 = 2, \quad c_1 = 1, \quad c_2 = 3;$
9. $r_1 = 2, \quad r_2 = 2, \quad c_1 = 2, \quad c_2 = 2;$
10. $r_1 = 2, \quad r_2 = 2, \quad c_1 = 2, \quad c_2 = 3;$
11. $r_1 = 2, \quad r_2 = 2, \quad c_1 = 3, \quad c_2 = 3.$