
Mirko soon realised that number sequences are not the best career choice, and went right back to letter-table business.

Mirko's table has **R** rows and **C** columns and consists of lowercase letters.

Each cell of the table is a square of equal size. We assign coordinates to vertices of those squares, so that upper-left corner of the table has coordinates $(0, 0)$, upper-right $(C, 0)$, lower-left $(0, R)$, and lower-right (C, R) .

We say that **polygon** within the table is **monoliteral** if the following holds:

1. its vertices are from the described set of cell-square vertices,
2. its edges are parallel to coordinate axes,
3. all letters inside the polygon are equal.

A simple polygon for which first two conditions are true (third one may or may not be true) is given. Mirko would like to know the number of **monoliteral** polygons that can be obtained by **moving** the given one up, down, left, or right or any combination thereof, but **not rotating**.

INPUT

The first line of input contains two space separated integers **R** and **C** ($1 \leq R, C \leq 500$).

Each of the next **R** lines contains exactly **C** lowercase letters, this is Mirko's table.

The following line contains integer **V** ($4 \leq V \leq 500$), number of vertices of given polygon.

Each of the next **V** lines contains two integers **X**, **Y** ($0 \leq X \leq C, 0 \leq Y \leq R$). These are the coordinates of the vertices of the given polygon. Vertices are given in clockwise order.

The given polygon will satisfy conditions 1 and 2 from above.

OUTPUT

In the first and only line of output, print expected number of polygons.

SCORING

In test cases worth 40% of total points, **R**, **C** and **V** will not exceed 20.

In test cases worth 70% of total points, **V** will not exceed 20.

EXAMPLE TEST DATA

input 3 3 aaa aaa aaa 4 2 0 2 2 0 2 0 0	input 3 3 aaa aba aaa 4 2 0 2 2 0 2 0 0	input 5 4 xyyx xyyy xxyy xxxx xxxx 8 1 3 1 2 0 2 0 0 2 0 2 1 3 1 3 3
output 4	output 0	output 2