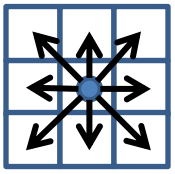
Q3: Sweep Those Mines…

	A	B	C	D
1	M	1	1	M
2	1	1	1	1
3	.	.	1	1
4	1	1	3	M
5	1	M	3	M
6	1	1	2	1

In the classic Minesweeper game, a two-dimensional MxN grid contains M*N cells. The M columns are labeled by letters (A, B, C, ...) while the N rows are labeled by numbers (1, 2, 3, …).



Each cell has up to eight direct neighboring cells, as shown on the left. Corner cells in the grid have three neighbors, edge cells have five. If a cell contains a mine, it is labeled "M".

Empty cells are labeled "." (period) if no direct neighboring cell has a mine; otherwise an empty cell is labeled by a number from 1 to 8, reflecting the number of direct neighboring cells that contain a mine.

A grid is initialized with *K* initial mines – in the example above, there are mines in A1, D1, D4, B5, and D5; these cells are all labeled with an "M". Cell B3 is labeled "." because none of its 8 direct neighbors has a cell. Cell C4 is labeled "3" because of the mines in cells B5, D4 and D5. The program must output a representation of each cell corresponding to the full grid.

Input

The first line of input will be two integers separated by a space representing the values of *M* (columns) and *N* (rows). The second line of input contains a single integer *K* representing the number of mines in the grid. The next *K* lines of input will each contain an UPPER CASE LETTER and a number, separated by a space, representing the column and row of a mine in the grid. You can assume that $1 < M < 10$, $1 < N < 10$, and $0 < K < 20$. You can assume that each of the *K* lines represents a valid grid location.

Output

Your output will contain *N* rows of *M* characters each on a line by itself. Each cell containing a mine is represented by an "M" character; each empty cell whose direct neighbors are all empty is represented by a "." (period) character, and other empty cells are labeled by a digit from 1 to 8 representing the number of direct neighboring cells that contain a mine.

Sample Input and Output

Input	Output
4 6 5 A 1 D 1 D 4 B 5 D 5	M11M 1111 ..11 113M 1M3M 1121
2 2 1 A 1	M1 11

Input	Output
8 2 4 A 1 A 2 H 1 H 2	M2....2M M2....2M
4 4 4 A 4 B 4 C 4 D 4	.... 2332 MMMM

Input	Output
8 8 10 A 3 B 3 G 2 H 7 A 5 D 1 D 6 D 5 F 2 H 6	..1M2221 22212MM1 MM1.1221 33211... M12M2.11 112M2.2M ..111.2M 11