Magnet puzzle

Cost: 8 | Solved: 7

Memory limit: 256 MBs

Time limit: 1 s

Input: input.txt

Output: output.txt

Task:

You are given a field split into ***m*** rows and ***n*** columns (***m*** != ***n***). The field is made of rectangles with the size of 2*1 that can be placed either vertically or horizontally. On each rectangle place you can put a bipolar magnet (which size is also 2*1), one half of which has a positive charge ("+" symbol) and another – a negative charge ("-"symbol). You can leave a rectangle empty as well. It is prohibited to replace rectangles.

You need to place magnets on field in such a way: the quantity of +'s and -'s in rows and columns is strictly equal to certain numbers (which are set for each row and column).

You can't place magnets in a way that sides with the same polarity are adjacent. But such magnets can be placed side by side diagonally.

Input:

The first line contains two naturals ***m*** and ***n*** – the quantity of rows and columns of the field (1 ≤ ***m***, ***n*** ≤ 50).

Then there go four arrays on four lines in such order: *top*, *bottom*, *left*, *right*.

Top and *bottom* contain ***n*** elements each, *left* and *right* – ***m*** elements each.

The *top* and *left* arrays represent the quantity of "positive" cells in each row and column, the *bottom* and *right* – "negative" cells accordingly. If an element of an array equals -1, it means that the quantity of negative/positive charges in this row/column is irrelevant.

The next ***m*** lines contain ***n*** elements each, representing the field in the following way:

The cells of this matrix can be one of the symbols T, B, L or R.

T and B (Top & Bottom) indicate the top and bottom cells of the same vertically arranged magnet, L and R (Left & Right) indicate the left and right cells of the horizontally arranged magnet.

Output:

You have to output the representation of the field according to the task, putting “+” and “-“ in the cells where the positive/negative sides of magnets should be, and “X” if the cell should stay empty.

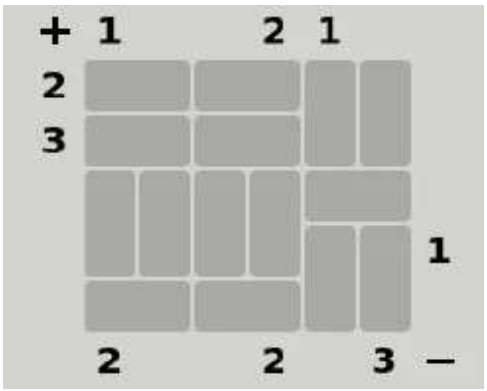
If it’s impossible to form such representation, write “Solution does not exist”.

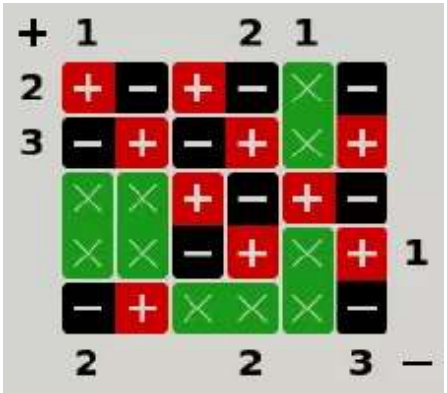
Example:

Input	Output
4 3 2 -1 -1 -1 -1 2 -1 -1 2 -1 0 -1 -1 -1 T T T B B B T L R B L R	+ X + - X - + - + - + -

5 6 1 -1 -1 2 1 -1 2 -1 -1 2 -1 3 2 3 -1 -1 -1 -1 -1 -1 1 -1 L R L R T T L R L R B B T T T T L R B B B B T T L R L R B B	+ - + - X - - + - + X + X X + - + - X X - + X + - + X X X-

The graphic representation of the second example :





As you can see, the numbers on the top and the left show how many positive charges each column/row should contain. Same applies for the bottom and the right for negative charges. The initial field is presented on the first picture; one of possible solutions of the task is presented on the second.