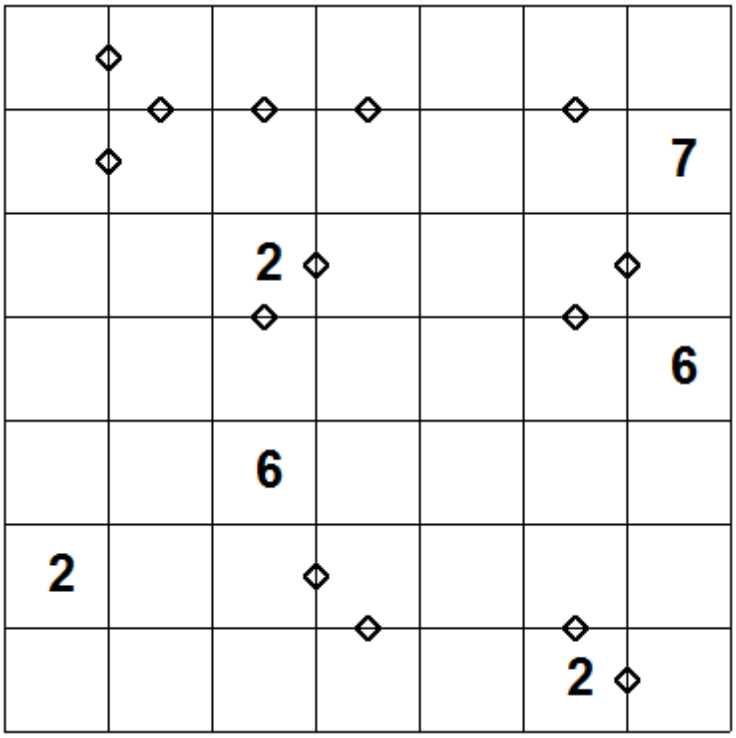
N · Neighbors

The ***Neighbors Puzzle*** is based on the idea that two integers are *neighbors* if they differ by one. The puzzle consists of a grid of ***N*** rows and ***N*** columns. On some of the internal edges are diamonds. In addition, a small number of values will be pre-specified (the 7 in row 2 column 7, for example).



To solve the puzzle, fill in the empty squares with integers from 1 to ***N***, so that:

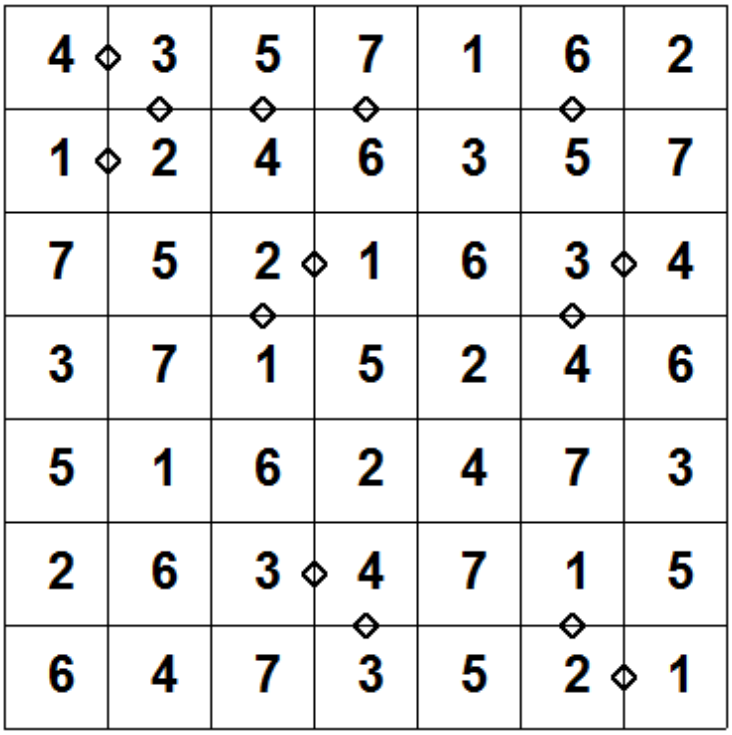
In each row, each value from 1 to ***N*** appears exactly once.

In each column, each value from 1 to ***N*** appears exactly once.

If there is a diamond between two values, they are neighbors (differ by 1).

If there is not a diamond between two values, they are not neighbors (differ by more than 1).

For example, a solution to the puzzle above is on the next page…



Write a program to solve Neighbor Puzzles.

(Input and Output specifications are on the next pages)

Input

The first line of input contains two space separated decimal integers N, $(4 \leq N \leq 12)$ which is the number of rows and columns and K, $((N/2)+(N*N)/16 \leq K \leq N*N)$, which is the number of pre-specified values.

The next $(2N-1)$ lines of input consist of the values 0 or 1 indicating "*not a neighbor*" or "*is a neighbor*" respectively with no spaces between them.

The odd numbered rows of the set contain $(N-1)$ values corresponding to constraints on values on either side of vertical lines within a box.

The even numbered rows contain N values corresponding to constraints on the values above and below the symbol.

These $(2N-1)$ lines are followed by K lines of three space separated decimal integers. The values give the row, column and value in that order (all 1 … N) of each pre-specified value.

The input data supplied is guaranteed to generate a single unique solution to the puzzle.

Output

Your program should produce N lines of output where each line consists of N decimal digits separated by a single space. The value in the j^{th} position in the i^{th} line of the N output lines is the solution value in column j of row i.

Sample Input	Sample Output
7 6 100000 0111010 100000 0000000 001001 0010010 000000 0000000 000000 0000000 001000 0001010 000001 2 7 7 6 1 2 3 3 2 7 6 2 5 3 6 4 7 6	4 3 5 7 1 6 2 1 2 4 6 3 5 7 7 5 2 1 6 3 4 3 7 1 5 2 4 6 5 1 6 2 4 7 3 2 6 3 4 7 1 5 6 4 7 3 5 2 1