

Problem J. Matrix Transformation

Input file: `standard input`
Output file: `standard output`
Time limit: 1 second
Memory limit: 1024 megabytes

Bobo has a matrix of n rows and n columns. The rows are numbered by $0, 1, \dots, (n-1)$ from top to bottom, and the columns are numbered by $0, 1, \dots, (n-1)$ from left to right. The cell in the intersection of the i -th row and the j -th column is denoted as (i, j) . For each cell (i, j) , there is a number $i \times n + j$ written in.

Bobo is going to perform q transformations successively. The transformations are of 2 kinds. The i -th transformation is of t_i -th kind, and it's described by 3 parameters l_i, r_i, d_i .

If $t_i = 1$, the number in cell $(x, (y + d_i) \bmod n)$ where $l_i \leq x \leq r_i, 0 \leq y < n$ will be transferred to the cell (x, y) by the transformation.

If $t_i = 2$, the number in cell $((x + d_i) \bmod n, y)$ where $0 \leq x < n, l_i \leq y \leq r_i$ will be transferred to the cell (x, y) by the transformation.

Note that $a \bmod b$ means the remainder of a after division by b .

Bobo would like to know the final configuration of the matrix.

Input

The first line contains 2 integers n, q ($1 \leq n \leq 200, 1 \leq q \leq 10^5$).

The i -th of the following q lines contains 4 integers t_i, l_i, r_i, d_i ($t_i \in \{1, 2\}, 0 \leq l_i \leq r_i < n, 0 \leq d_i < n$).

Output

n lines. The i -th line contains n integers $a_{i,0}, a_{i,1}, \dots, a_{i,n-1}$ which denotes the final number in cell (i, j) .

Examples

standard input	standard output
3 2 1 1 1 1 2 1 1 1	0 5 2 4 7 3 6 1 8
3 1 1 0 2 1	1 2 0 4 5 3 7 8 6