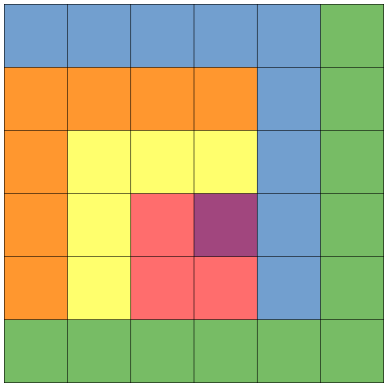
Problem Little Square

Input file `stdin`
Output file `stdout`

After winning every chess tournament on a 100 km radius around Râmnicu-Vâlcea, Bogdan realized his only real opponent is himself. He decided to quit chess and invent his own wooden piece-placing game. He starts with a square board of side N and N L-shaped pieces. The two "arms" of the piece are of equal length, and all pieces have different lengths between 1 and N. The rows of the board, as well as its columns, are numbered from 1 to N. A position on the board is identified by two numbers X and Y, representing the row and the column of that position, respectively. The top left corner of the board is denoted $(1, 1)$.



Example of a filled board of size 6. Notice the L-shaped pieces.

Bogdan wants to find out how many different ways he can arrange the pieces on the board. To make the problem more interesting he decided to impose P restrictions. A restriction consists of 3 integers (L, X, Y), meaning that the corner of the piece with side length L must be placed in the position (X, Y). Notice that the piece can be in any orientation as long as its corner is in the correct position.

Task

Given the size N of a board and P restrictions, find how many ways you can complete the board, modulo $1\,000\,000\,007$, satisfying the P restrictions.

Input

The first line of the input contains the integer T, the number of games you'll play.
Each game is given in the following way:

- the first line contains the integer N, the length of the board's side;
- the second line contains the integer P, the number of imposed restrictions;
- the next P lines contain each 3 integers L, X, Y, with the meaning specified in the statement.

Output

The output will consist of T lines, the i-th line $(1 \leq i \leq T)$ containing the result for the i-th game.

Restrictions

- $1 \leq T \leq 1000$
- $1 \leq N \leq 200\,000$
- $0 \leq P \leq min(100\,000, N)$
- $1 \leq L, X, Y \leq N$

- A piece of any given size will have at most one restriction during a game.
- It is guaranteed that there exists at least one way to complete the board.
- The sum of P over all test cases doesn't exceed 100 000.

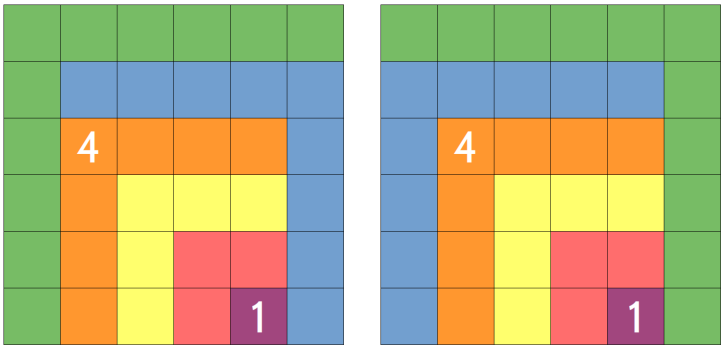
#	Points	Restrictions
1	0	Examples
2	6	$P = 0$
3	9	$N \leq 8$
4	16	$P = 1, L = 1, X = 1$ (one restriction imposed, for a piece with the side of length 1 placed at the top of the board)
5	23	$P = 1, L = 1$ (one restriction imposed, for a piece with side length 1)
6	17	$P = 1$
7	29	No further restrictions.

Examples

Input file	Output file
3 6 2 1 6 5 4 3 2 2 0 3 1 2 2 2	2 4 4
1 40 1 7 20 20	202092513

Explanation for the first example

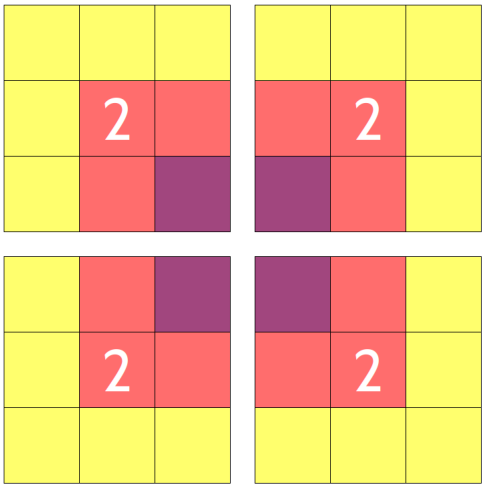
For the **first game** there are 2 ways to fill the board:



The 2 possible ways to complete the 1st game.

The **second game** doesn't have any restrictions, there are 4 ways to complete it.

The **third game** can be completed in 4 ways:



The 4 possible ways to complete the 3rd game.
Note the different orientations of the piece of side length 2.