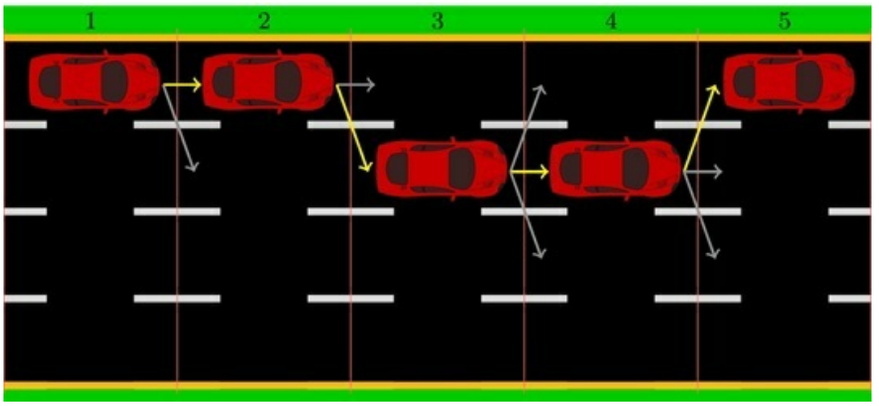
Xtreme Driving

Problem Statement

Alice, one of the IEEEXtreme participants, is on her way to her university to take part in this year's contest. To get to the university she has to drive on a four lane highway, but as the highway is very long she quickly becomes bored. She decides to practice for the contest by thinking about some problems related to the highway she's driving on. She comes up with the following problem:

Let's say that, in a single unit of time, her car, which is of unit-length, can perform one of the following three actions:

- Drive one unit forward, staying in the same lane
- If the car is not on the left-most lane, drive one unit forward and switch to the lane on the left
- If the car is not on the right-most lane, drive one unit forward and switch to the lane on the right



If the highway is K units in length, in how many ways is it possible to drive through the highway, provided that she starts on the first unit of the highway at the left-most lane, and ends at the last unit of the highway, also at the left-most lane?

As she's been training very hard for the contest, it doesn't take her long to come up with a solution to this problem. But all of a sudden, out of nowhere, a large cow appears in front of her car, and she just barely manages to avoid crashing into it. She got a bit too distracted thinking about the problem... But this incident gives her an idea: what if the highway had a set of stationary cows that the car must avoid crashing into?

Unfortunately she doesn't have time to think about this version of the problem as she just arrived at the university and the contest is about to start. When the contest starts, she is very surprised to see that the problem she was thinking about is just like one of the problems presented in the contest. What a coincidence! Again her hard practice pays off and she quickly solves the problem. But the real question is, can you?

Input Format

Input begins with two integers, K, the length of the highway, and N, the number of cows standing on the highway, subject to the following constraints:

$2 <= K <= 10^{18}$

$0 <= N <= 100$

$N <= 4(K - 2)$

Then follow N lines. The i^{th} line contains two integers describing the location of the i^{th} cow, x_i, the lane on which the cow is standing (1 being the left-most, and 4 being the right-most), and y_i, the unit on which the cow is standing, subject to the following constraints:

$1 <= x_i <= 4$

$1 < y_i < K$

Notice that no cows are on the first or last unit of the highway. It is also guaranteed that no two cows share the same position.

Output Format

You are to output the number of ways to drive from the left-most lane at the first unit of the highway to the left-most lane at the K^{th} unit of the highway subject to the rules described above, and the additional constraint that the car must not drive to a position occupied by a cow.

As the number of ways can be quite large, please output the answer modulo $10^9 + 7$. Note that this is the same as the remainder when dividing the number of ways by $10^9 + 7$.

Sample Input

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5 2
1 2
2 3
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Sample Output

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3
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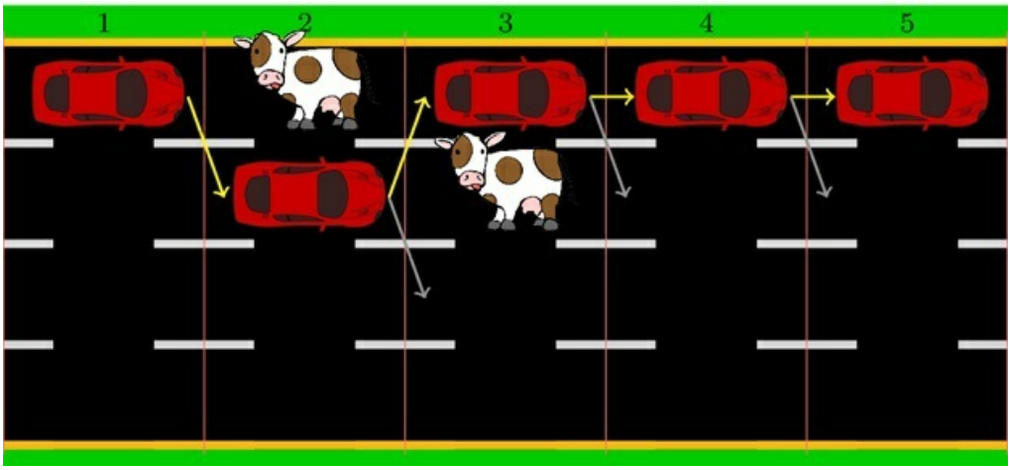
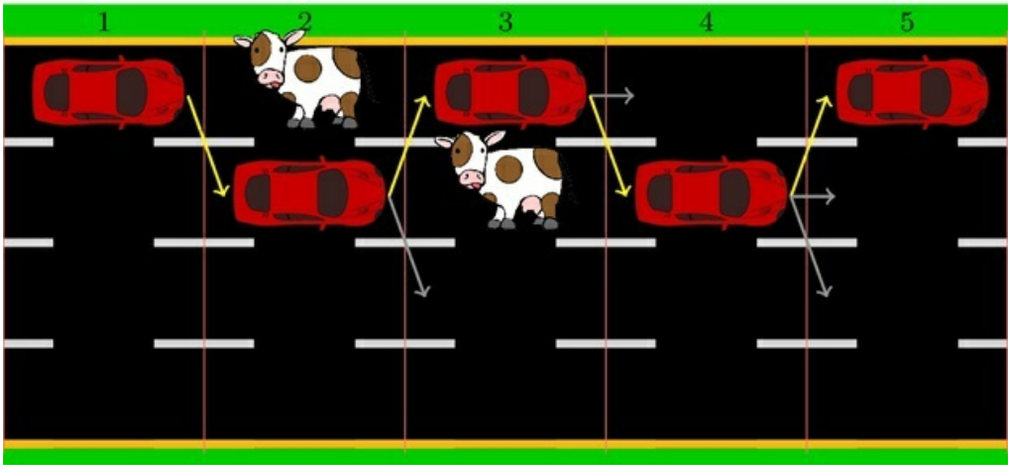
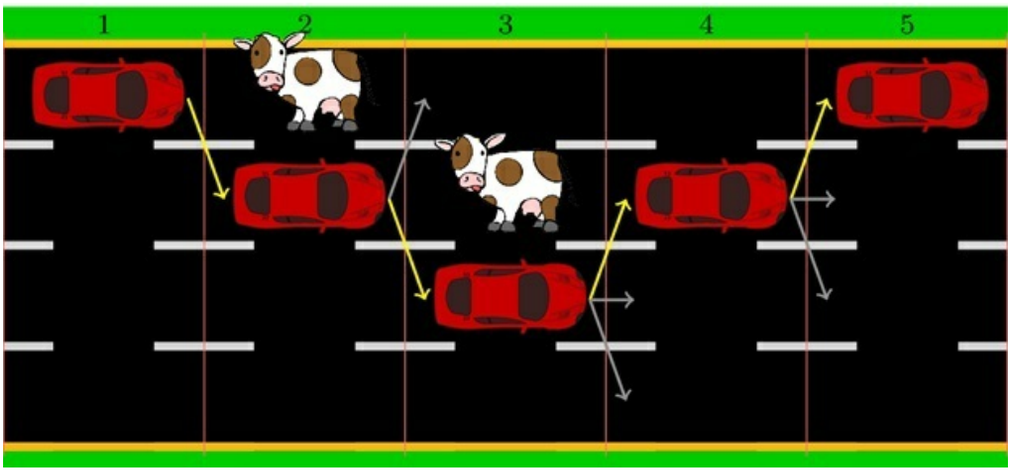
Explanation

In this example there are three ways to drive through the highway, and they are shown in the following figures. Notice that the car can drive in between cows (as long as other driving rules are fulfilled), but it must not drive to a unit occupied by a cow.







Note: Two more sample test cases are available if you click on the "Run" button.