







HELP H0ME TOP CATALOG CONTESTS GYM PROBLEMSET GROUPS RATING EDU API CALENDAR

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PROBLEMS SUBMIT CODE MY SUBMISSIONS STATUS HACKS ROOM STANDINGS CUSTOM INVOCATION

D. Baggage Claim

time limit per test: 2 seconds memory limit per test: 256 megabytes

Every airport has a baggage claim area, and Balbesovo Airport is no exception. At some point, one of the administrators at Sheremetyevo came up with an unusual idea: to change the traditional shape of the baggage claim conveyor from a carousel to a more complex form.

Suppose that the baggage claim area is represented as a rectangular grid of size $n \times m$. The administration proposed that the path of the conveyor should pass through the cells $p_1, p_2, \ldots, p_{2k+1}$, where $p_i = (x_i, y_i)$.

For each cell p_i and the next cell p_{i+1} (where $1 \leq i \leq 2k$), these cells must share a common side. Additionally, the path must be simple, meaning that for no pair of indices i
eq j should the cells p_i and p_j coincide.

Unfortunately, the route plan was accidentally spoiled by spilled coffee, and only the cells with odd indices of the path were preserved: $p_1, p_3, p_5, \dots, p_{2k+1}$. Your task is to determine the number of ways to restore the original complete path $p_1, p_2, \ldots, p_{2k+1}$ given these k+1 cells.

Since the answer can be very large, output it modulo $10^9 + 7$.

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 < t < 3 \cdot 10^4$). The description of the test cases follows.

The first line of each test case contains three integers n, m, and k ($1 \leq n, m \leq 1000$, $n\cdot m\geq 3, 1\leq k\leq \left\lfloor rac{1}{2}(nm-1)
ight
floor$ the dimensions of the grid and a parameter defining the length of the path.

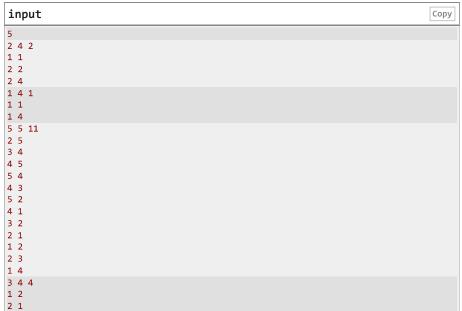
Next, there are k+1 lines, the i-th of which contains two integers x_{2i-1} and y_{2i-1} ($1 \leq x_{2i-1} \leq n, 1 \leq y_{2i-1} \leq m$) — the coordinates of the cell p_{2i-1} that lies on the path.

It is guaranteed that all pairs $\left(x_{2i-1},y_{2i-1}
ight)$ are distinct.

It is guaranteed that the sum $n \cdot m$ over all test cases does not exceed 10^6 .

For each test case, output a single integer — the number of ways to restore the original complete path modulo $10^9 + 7$.

Example



Codeforces Round 1021 (Div. 2)

Finished

Practice



→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++23 14.2 (64 bit, ms ➤

Choose file:

Choose File No file chosen

Submit

→ Last submissions

Last Sabinissions		
Submission	Time	Verdict
317466305	Apr/27/2025 16:49	Accepted

→ Problem tags

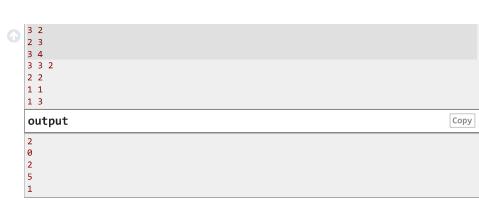
combinatorics graphs math

No tag edit access

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→ Contest materials

- Announcement
- Tutorial (ru)



Note

In the first test case, there are two possible paths:

$$\begin{array}{c} \bullet \ \, (1,1) \to (2,1) \to (2,2) \to (2,3) \to (2,4) \\ \bullet \ \, (1,1) \to (1,2) \to (2,2) \to (2,3) \to (2,4) \\ \end{array}$$

$$ullet$$
 $(1,1)
ightarrow (1,2)
ightarrow (2,2)
ightarrow (2,3)
ightarrow (2,4)$

In the second test case, there is no suitable path, as the cells (1,1) and (1,4) do not have a common neighboring cell.

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