

Matrices

SEASON 2021/2022 – FORTH ROUND



Harry has a very large matrix. To be precise matrix $N \times M$. It was Harry's birthday recently, and (to his surprise) he received a present from his friends - a set of non-negative numbers. Now he plays all day arranging the numbers in the matrix. To make it more interesting, he came up with the following rule: a cell in the i -th row of the j -th column (rows and columns are numbered from 1) cannot contain a number greater than $\min(i, j)$.

Since Harry values his friends very much, he wants to make them happy by showing them a **nice matrix**. To him, a **nice matrix** is a matrix in which the sum of the numbers in each row and each column is an even number (yes, Harry is weird). The figure below gives an example of a nice matrix of size 3×4 :

0	1	0	1
0	1	1	2
0	2	3	1

Harry, however, is a maximalist and one matrix is not enough for him. He wants to know how many **nice matrices** he can make. Unfortunately, he doesn't have time to do these absurd calculations, so he asks you to help him by finding how many matrices satisfy the condition.

Since, this number can be extremely large, you need to print it modulo $1,000,000,007$ ($10^9 + 7$).

Input

On the first line of the `matrices.in` file, a positive integer T is entered specifying the number of test cases. The next T lines specify the matrix sizes N and M for the corresponding test.

Output

In the `matrices.out` file, you should print the number of **nice matrices** for each test. The answer for each test should be on a separate line.

Constraints

$$1 \leq N, M \leq 10^5$$

$$1 \leq T \leq 10$$

Time limit: 1sec.

Memory limit: 256 MB.

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Sample test

Input (matrices.in)	Output (matrices.out)
4 2 3 4 2 1 5 134 231	9 27 1 716490517