

# Matrices with XOR property

Imagine A is a  $N \times M$  matrix with two basic properties

1) Each element in the matrix is distinct and lies in the range of  $1 \leq A[i][j] \leq (N * M)$

2) For any two cells of the matrix,  $(i_1, j_1)$  and  $(i_2, j_2)$ , if  $(i_1 \wedge j_1) > (i_2 \wedge j_2)$  then  $A[i_1][j_1] > A[i_2][j_2]$ , where

$1 \leq i_1, i_2 \leq N$

$1 \leq j_1, j_2 \leq M$ .

$\wedge$  is Bitwise XOR

Given N and M, you have to calculate the total number of matrices of size  $N \times M$  which have both the properties mentioned above.

## Input format:

First line contains T, the number of test cases.  $2 * T$  lines follow with N on the first line and M on the second, representing the number of rows and columns respectively.

## Output format:

Output the total number of such matrices of size  $N \times M$ . Since, this answer can be large, output it modulo  $10^9 + 7$

## Constraints:

$1 \leq N, M, T \leq 1000$

## SAMPLE INPUT

1

2

2

## SAMPLE OUTPUT

4

## Explanation

The four possible matrices are:

[1 3] | [2 3] | [1 4] | [2 4]

[4 2] | [4 1] | [3 2] | [3 1]