Randias Permutation Task

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

For two permutations A and B of length n, Randias can generate a permutation C of length n as $C = A \circ B$ in this way: for each $1 \le i \le n$, $C[i] = A[B[i]]$.

Now he is given m permutations $A_1, A_2, \ldots, A_m$, each of them is of length n. He wants to choose a non-empty set of indices $i_1, i_2, \ldots, i_k$ ($1 \le k \le m, 1 \le i_1 < i_2 \cdots < i_k \le m$), and calculate $C = (((A_{i_1} \circ A_{i_2}) \circ A_{i_3}) \circ A_{i_4}) \cdots \circ A_{i_k}$. Randias wants to know, how many possible permutations C he can generate? Output the answer modulo $10^9 + 7$.

A permutation of length n is an array consisting of n distinct integers from 1 to n in arbitrary order. For example, $[2, 3, 1, 5, 4]$ is a permutation, but $[1, 2, 2]$ is not a permutation (2 appears twice in the array), and $[1, 3, 4]$ is also not a permutation ($n = 3$ but there is 4 in the array)

Input

The first line contains two positive integers n, m ($1 \le n \cdot m \le 180$), denoting the length of the permutation and the number of permutations.

The following m lines, each line contains n distinct integers, denoting one permutation.

Output

One single integer, denoting the number of possible permutations C Randias can generate, modulo $10^9 + 7$.

Examples

standard input	standard output
5 4 1 2 3 4 5 5 1 3 4 2 3 4 1 5 2 5 2 4 1 3	8
2 1 2 1	1