

Data Structure You've Never Heard Of

Input file: `standard input`
Output file: `standard output`
Time limit: 2 seconds
Memory limit: 64 megabytes

Bobo had got a sequence $a_1, a_2, \dots, a_n$ of d -dimension binary vectors, and he would like to find the number of non-descending subsequences modulo $(10^9 + 7)$.

Formally, a non-descending subsequence of a is a sequence $(i_1, i_2, \dots, i_k)$ where $i_1 < i_2 < \dots < i_k$ and $a_{i_1} \leq a_{i_2} \leq \dots \leq a_{i_k}$. For two d -dimension binary vectors $u = (u_1, u_2, \dots, u_d)$ and $v = (v_1, v_2, \dots, v_d)$, $u \leq v$ if and only if $u_i \leq v_i$ holds for all $1 \leq i \leq d$.

Input

The first line contains 2 integers n and d ($1 \leq n \leq 2 \times 10^5, 1 \leq d \leq 16$).

The i -th of the following n lines contains d integers $a_{i,1}, a_{i,2}, \dots, a_{i,d}$ ($0 \leq a_{i,j} \leq 1$).

Output

An integer denotes the number of non-descending subsequences modulo $(10^9 + 7)$.

Examples

standard input	standard output
3 2 00 00 11	7
4 3 110 100 011 101	5