Linear Algebra Intensifies

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	512 megabytes

The old linear algebra professor from a previous Moscow subregional problem keeps torturing his students with massive homework assignments. He came up with a way to describe a huge symmetric square matrix faster than dictating all its elements.

Professor chooses a positive integer n and names m ranges $[l_1, r_1], \ldots, [l_m, r_m]$ such that for all $i = 1, \ldots, m$ both l_i and r_i are integer, and $1 \le l_i \le r_i \le n$. The $n \times n$ matrix A is then constructed as follows: for any pair of indices x, y, the matrix element $A_{x,y}$ is equal to the number of indices i ($1 \le i \le m$) such that both x and y belong to the range $[l_i, r_i]$. For example, for $n = 3$ and the list of ranges $[1, 2], [2, 3], [1, 2], [3, 3]$, the resulting matrix A is $\begin{pmatrix} 2 & 2 & 0 \\ 2 & 3 & 1 \\ 0 & 1 & 2 \end{pmatrix}$.

Given n and the list of ranges, professor then asks students to compute determinant of the resulting matrix A. Professor doesn't care for comparing huge numbers, so he asks for the answer to be computed modulo his favourite prime number 998 244 353.

Professor may be cruel, but he is a reasonable teacher: he agrees there's little merit in exercise when writing down the problem is harder than actually solving it afterwards. Thus, in his assignments m is never much greater than n, more precisely, $m \le n + 300$.

After a few semesters in professor's class, you are very much done with his attitude and decided to write a program that will compute the answer for you.

Input

The first line contains two integers n and m ($1 \le n, m \le 500\,000$, $m \le n + 300$).

The following m lines describe the ranges named by professor. The i-th of these lines contains two integers l_i, r_i ($1 \le l_i \le r_i \le n$).

Output

Print a single integer — determinant of the matrix A modulo 998 244 353.

Example

standard input	standard output
3 4 1 2 2 3 1 2 3 3	2