Problem C. Segments and Subsets

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	512 mebibytes

Consider a collection of segments on a coordinate axis. The coordinates of endpoints are integers from 0 to x. There is no intersecting pair of segments: for any two segments, either one of them contains another, or they have at most one common point.

Your goal is to transform your collection of segments into just a single segment $[0, x]$. No other segments may remain. To achieve this, you can make moves. Each move has one of the following types:

- Select two segments that have a single common point: the right endpoint of the left segment coincides with the left endpoint of the right segment. Merge them into one segment: from leftmost to rightmost point. This move does not cost anything.
- Select one segment. Expand it to the left or to the right by 1 unit. This move costs 1 coin.

If, at some moment of time, there are two or more equal segments, only one of them remains, while the other disappear instantly.

For an initial collection of segments S, let $F(S)$ be the minimum number of coins needed to transform it into just a single segment $[0, x]$. You are given a collection of n segments. Consider all its $2^n - 1$ non-empty sub-collections, calculate F for each of them, and find the sum of these values modulo 998 244 353.

Input

The first line contains an integer t ($1 \le t \le 10^5$), the number of test cases. The test cases follow.

Each test case starts with a line containing two integers: the number of segments n ($1 \le n \le 10^5$) and the coordinate x ($1 \le x \le 10^9$). The next n lines describe the segments. The i-th of these lines contains two integers ℓ_i and r_i: the endpoints of the i-th segment ($0 \le \ell_i < r_i \le x$).

The sum of n over all test cases does not exceed 10^5.

Output

For each test case, print a line with a single integer: the required sum modulo 998 244 353.

Example

standard input	*standard output*
3 2 5 1 4 2 3 3 8 1 3 3 5 5 8 7 10 1 5 2 3 3 4 4 5 5 10 6 9 7 8	10 28 806