

# Array Spread

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

Vasya wants to construct an array  $a$  of size  $n$  consisting of non-negative real numbers.

He has  $m$  segments  $[l_1, r_1], [l_2, r_2], \dots, [l_m, r_m]$  ( $1 \leq l_i \leq r_i \leq n$ ), defining  $m$  subarrays of array  $a$ .

Let us define *spread* of array  $a$  as follows:

- Calculate subarray sums  $s_i = \sum_{j=l_i}^{r_i} a_j$ .
- Spread of array  $a$  is equal to  $\frac{\max_{j=1}^m s_j}{\min_{j=1}^m s_j}$ . If  $\min_{j=1}^m s_j = 0$ , spread is equal to  $+\infty$ .

Find the minimum spread among all possible arrays  $a$ . It is guaranteed that the minimum exists. You should find the answer by modulo 998244353.

We can show that each answer can be written in the form  $\frac{p}{q}$  where  $p$  and  $q$  are relatively prime integers and  $q \not\equiv 0 \pmod{998244353}$ . The answer by modulo 998244353 is equal to  $(p \cdot q^{-1})$  modulo 998244353.

## Input

The input consists of multiple test cases. The first line contains a single integer  $t$  ( $1 \leq t \leq 2000$ ) — the number of test cases. The description of the test cases follows.

The first line of each test case contains two integers  $n, m$  ( $1 \leq n \leq 10^9, 1 \leq m \leq 2000$ ) — array size and the number of segments.

Each of the next  $m$  lines contains two integers  $l_i, r_i$  ( $1 \leq l_i \leq r_i \leq n$ ) — description of the  $i$ -th segment.

It is guaranteed that the sum of  $m$  for all test cases does not exceed 2000.

## Output

For each test case print a single integer — the answer to the problem by modulo 998244353.

## Example

standard input	standard output
3	1
3 3	2
1 3	499122178
2 3	
1 2	
12 6	
2 3	
5 7	
1 9	
4 8	
1 2	
7 11	
4 5	
3 4	
2 3	
1 2	
4 4	
1 1	

## Note

In the first test case, the minimum spread is 1 and it can be achieved, for example, for  $a = [0, 3, 0]$ . Subarray sums are  $s = [3, 3, 3]$ .

In the second test case, the minimum spread is 2 and it can be achieved, for example, for  $a = [0, 1, 0, 0, 1, 0, 0, 0, 0, 0, 2, 0]$ . Subarray sums are  $s = [1, 1, 2, 1, 1, 2]$ .

In the third test case, the minimum spread is  $\frac{3}{2}$  and it can be achieved, for example, for  $a = [2, 1, 1, 2]$ . Subarray sums are  $s = [3, 2, 3, 2, 2]$ .