

Permutation Counting 4

Input file: **standard input**
Output file: **standard output**
Time limit: **3 seconds**
Memory limit: **1024 megabytes**

Given n pairs (l_i, r_i) , you need to count how many permutations p of size n there are such that $l_i \leq p_i \leq r_i$. You only need to output the answer modulo 2.

Input

The input consists of multiple test cases. The first line contains a single integer t ($1 \leq t \leq 10^6$) — the number of test cases. The description of the test cases follows.

The first line contains one single integer n ($1 \leq n \leq 10^6$) — the size of the permutation p you need to count.

Then, the i -th line of the following n lines contains two integers l_i, r_i ($1 \leq l_i \leq r_i \leq n$).

It is guaranteed that the sum of n over all test cases does not exceed 10^6 .

Output

For each test case, output one single integer representing the answer modulo 2.

Example

standard input	standard output
4	0
5	1
1 2	0
1 5	0
1 2	
1 2	
2 2	
5	
1 1	
2 4	
2 3	
5 5	
3 4	
5	
3 5	
1 2	
3 4	
3 5	
3 3	
5	
1 5	
1 4	
4 5	
5 5	
1 2	