Problem C. 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 $l_i \le p_i \le r_i$. 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 ($1 \le t \le 10^6$) — the number of test cases. The description of the test cases follows.

The first line contains one single integer n ($1 \le n \le 10^6$) — 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 ($1 \le l_i \le r_i \le n$).

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 5 1 2 1 5 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	0 1 0 0