

Problem D. Director and Excitement

Input file: *standard input*
Output file: *standard output*
Time limit: 5 seconds
Memory limit: 1024 mebibytes

The Cook Chicken Potato Contest is one of the most renowned events in the culinary world. The competition venue provides k cooking stations, and before the start, the participants will be divided into k equally sized teams by the Contest Director, known as Small Q.

To test the teamwork among participants and to add more excitement to the competition, Small Q wants to arrange the teams in such a way that the strength differences among participants in the same team are as large as possible. Let the strengths of the participants be denoted as a_1, a_2, \dots, a_n , and their respective team assignments as t_1, t_2, \dots, t_n . Small Q defines the excitement level of the competition as:

$$D = \min_{1 \leq i < j \leq n} \begin{cases} |a_i - a_j|, & t_i = t_j \\ +\infty, & t_i \neq t_j \end{cases}$$

Now, there are n potential participants. The possible strength of the i -th participant is described by an interval $[\ell_i, r_i]$, indicating that their actual strength during a certain competition could turn out to be any real number within that interval. The participants are sorted by strength in non-decreasing order, which means that, for all $1 \leq i < j \leq n$, we have $\ell_i \leq \ell_j$ and $r_i \leq r_j$.

Small Q has q competition plans, where the i -th plan is to invite participants with indices between L_i and R_i . You need to help Small Q determine whether he can arrange the teams in such a way that it would be possible for the excitement level of the competition to be at least D_i .

Input

The first line of input contains an integer t ($1 \leq t \leq 10^5$), the number of test cases. For each test case:

The first line contains two integers, n and k ($1 \leq n \leq 5 \cdot 10^5$, $1 \leq k \leq \min(5, n)$), representing the number of potential participants and the number of teams.

The next n lines contain two integers, ℓ_i and r_i ($0 \leq \ell_i \leq r_i \leq 10^{12}$) for the i -th participant, indicating the possible strength they can exhibit. For all $1 \leq i < n$, we have $\ell_i \leq \ell_{i+1}$ and $r_i \leq r_{i+1}$.

The next line contains an integer q ($1 \leq q \leq 10^5$), indicating the number of competition plans.

The next q lines contain three integers: L_i , R_i , and D_i ($1 \leq L_i \leq R_i \leq n$, $(R_i - L_i + 1)$ is divisible by k , and $0 \leq D_i \leq 10^{12}$), indicating that the i -th competition plan is to invite participants with indices from L_i to R_i , and Small Q expects the excitement level to be at least D_i .

The sum of n over all test cases is at most 10^6 . The sum of q over all test cases is at most 10^5 .

Output

For each test case, output q lines. For the i -th output, print “YES” or “NO” to indicate whether Small Q’s expectation for the i -th plan can possibly be met.

Example

standard input	standard output
2	YES
4 2	YES
1 1	YES
3 3	YES
4 4	NO
6 6	YES
3	NO
1 2 3	YES
3 4 2	NO
1 4 2	
5 1	
1 3	
2 3	
4 6	
7 10	
8 12	
6	
1 3 2	
1 3 3	
2 4 4	
2 4 5	
3 5 4	
3 5 5	