

Problem C. Race

Input file: *standard input*
Output file: *standard output*
Time limit: 1 second
Memory limit: 256 mebibytes

Pigetown is a city with n crossings and m bidirectional roads. A huge race event is going to be held in Pigetown. There are k types of race tracks, and each road in the city can be viewed as a particular type of race track.

In the race, each participant should choose an integer i such that $1 \leq i \leq q$, start at crossing S_i , visit each type of race tracks the same number of times, and finally arrive at crossing T_i in order to finish the race.

Grammy wants to know if it is possible to finish the race when choosing each integer i . Write a program to help her solve the problem.

Input

The first line contains 4 integers n, m, k, q ($1 \leq n, m, q \leq 200\,000$, $1 \leq k \leq 30$), indicating the number of crossings, the number of roads, the number of race track types, the upper limit of chosen integer i , respectively.

In the next m lines, each line contains 3 integers u, v, t ($1 \leq u, v \leq n$, $1 \leq t \leq k$), indicating that there is a bidirectional road between crossing u and crossing v with type t .

In the next q lines, each line contains 2 integers S_i, T_i ($1 \leq S_i, T_i \leq n$), indicating one possible combination of starting point and ending point.

Output

Output q lines.

In the i -th line, if it is possible to finish the race while choosing integer i , output “Yes”, otherwise output “No” (Without quotes).

Example

standard input	standard output
7 9 3 4	Yes
1 2 1	No
2 3 1	Yes
3 1 2	No
1 4 3	
5 6 2	
6 7 1	
6 7 3	
7 7 2	
5 5 1	
6 7	
1 4	
2 4	
2 5	