A Challenge For a Tourist

Input file: `standard input`
Output file: `standard output`
Time limit: 3 seconds
Memory limit: 512 mebibytes

A tourist is completing challenges. There are n cities, numbered from 1 to n, and there are m bidirectional roads between some pairs of cities. The i-th road connects cities u_i and v_i and has a *difficulty* w_i, which is a nonnegative integer.

A *path* between cities f and t is a pair (C, R), where

- $C = (c_0, \ldots, c_k)$ is a sequence of cities, where $c_0 = f$ and $c_k = t$,
- $R = (r_1, \ldots, r_k)$ is a sequence of roads, and for all i from 1 to k the road r_i connects cities c_{i-1} and c_i.

Note that a path may contain the same city more than once, and the same goes about the roads.

If r is a road, denote by $w(r)$ its difficulty. For a path (C, R), let its *difficulty* be $\max\{w(r) \mid r \in R\}$, and let its *hash* equal $w(r_1) \oplus \cdots \oplus w(r_k)$. Here by $x \oplus y$ we denote the xor (exclusive or) of x and y.

Finally, a *challenge* is a triple (f, t, h) denoting that the tourist has to travel from the city f to the city t using a path with hash equal to h.

Of course, the tourist wants to spend as little effort for each challenge as possible. Given q challenges, for each of them find the lowest difficulty of a path that fits into the constraints of the challenge, or report that there is no way to finish the challenge.

Input

The first line contains two integers n and m, separated by space ($1 \le n, m \le 200\,000$; $n \ge 2$).

The i-th of the following m lines contains three integers u_i, v_i, w_i ($1 \le u_i, v_i \le n$; $0 \le w_i < 2^{30}$) that represent the i-th road. There may be more than one road connecting the same pair of cities, and there may be roads that connect the same city with itself. The cities don't have to be accessible from each other, that is, there may be such pair of cities that there is no path between them.

The next line contains the only integer q, denoting the number of challenges ($1 \le q \le 200\,000$).

The j-th of the following q lines contains three integers f_j, t_j, h_j ($1 \le f_j, t_j \le n$; $0 \le h_j < 2^{30}$; $f_j \ne t_j$), representing the j-th challenge.

Output

Print q integers, i-th of them being the lowest possible difficulty of a path that completes the i-th challenge, or -1, if there is none.

Example

standard input	standard output
6 6 5 6 3 6 2 2 1 2 1 2 3 2 2 4 3 4 5 4 3 1 3 1 1 3 3 1 3 5	-1 2 4