Module 1: The Core

Problem Description

Suppose that two companies, Snapp and Tap30, have decided to enter the freight transport market to increase their market share in various dimensions. The issue is that the players in this industry have extensive experience and resources, and the space for entering this market is very limited.

Consequently, Snapp and Tap30 decided to enter this market together. By offering the best user experience and the best technology, they aim to capture a share of the market. They entered this market under the name **TapNap** (TapNap Bar). Now, the TapNap company has requested help from the students of the best university in the world. For each section of the existing problems, they have designed a similar question to find the best students to tackle the freight market together.

The Challenge

Time Limit: 4 seconds
Memory Limit: 1024 MB

In this highly professional market, the initial problem and its difference from taxi services is that every truck has a height, and every road has a height limit due to bridges, underpasses, or signs.

In this initial challenge, TapNap wants you to check, given the road limits provided, the height of the **tallest truck** among the trucks that have announced their availability (readiness to work) that is capable of traveling from intersection u to intersection v.

During the execution of the program, three types of events may occur:

1. A truck announces readiness to perform work (enters the program).
2. A truck announces fatigue and leaves the program (exits).
3. A request is made for a trip from intersection u to intersection v. You are expected to return the height of the tallest possible truck that can fulfill this request.

Notes:

- Due to existing disruptions, an exit request (Type 2) might be issued for a truck height that is not currently available.
- An entry request (Type 1) might be issued for a truck height that already exists. This means we can have more than one truck with the same height.
- Due to "dirty competition," spies from competitors might submit illogical requests where the source and destination are the same.
- If no truck exists that can traverse the path (either because the path is impossible for any height or no available truck is small enough), return `-1`.

Input Format

- The first line contains two integers n and m, representing the number of intersections and the number of streets, respectively.
- In each of the next m lines, three integers u, v, and w are given, representing a two-way street between intersection u and intersection v with a maximum height limit of w.
- The next line contains an integer q, the number of queries.
- In each of the next q lines, one of the three types of inputs is given:
  - `1 x`: A driver with a truck of height x has entered the program.
  - `2 x`: A driver with a truck of height x has left the program.
  - `3 u v`: A trip request from intersection u to intersection v. You must find the height of the tallest available truck that can perform this trip.

Constraints

- $1 \leq n, m, q \leq 2 \times 10^5$
- $1 \leq u, v \leq n$
- $1 \leq w, x \leq 10^9$

Output Format

For each query of type 3, output the height of the tallest truck that can perform the trip. If none of the trucks can perform the trip or no truck exists for the trip, output `-1`.