2024 INTERFERENCE

The spies of *Alpha Complex* run a complicated network of monitoring stations, each of which runs at a fixed frequency (1, 2, 3, 4 or 5). Esoteric regulations mean that stations that communicate directly have, in accordance with conflicting contractual obligations, a requirement for *near* or *far* frequencies.

Two frequencies are *near* if they are no more than 1 apart, otherwise they are *far*.

Budgetary cuts mean that some stations have sadly fallen into disrepair. The situation is not too extreme — yet — as no two in disrepair communicate directly and no stations communicate directly to more than one in disrepair. The spies of *Alpha Complex* have standards; this is not *Beta Complex*.

Messages can be passed between any two stations in the network by a sequence of direct station to station communications. Messages never reverse direction during a sequence and there are no sequences whereby messages can return to their originating station without passing through a station in disrepair. Communications that go through stations in disrepair suffer interference, which adds to the intrigue if messages do come back.

For example, suppose there are 4 stations and the direct connections are 1–2, 2–3, 3–4 and 4–1.

- Exactly one of these stations must be in disrepair, otherwise 1–2–3–4–1 would return a message to its originating station without passing through a station in disrepair;
- If all of the direct communications were required to be near then they could all operate at a frequency of 1;
- If all of the direct communications were required to be far then the odd numbered stations could operate at a frequency of 1 and the others could operate at a frequency of 3.

SAMPLE INPUT

```
4 1
2
1 2 1
2 3 1
3 4 1
4 1 1
-1 -1 -1
```

The first line of the input will contain two integers, s ($1 \leq s \leq 2^{10}$) indicating the number of stations (numbered from 1 to s), followed by d ($0 \leq d \leq s$) giving the number of stations in disrepair. This will be followed by d lines, each of which will give a single station in disrepair, without duplication. Each successive line will consist of three integers, the first two indicating a pair of (different) stations that communicate directly followed by a `0` or `1`, indicating a near or far requirement respectively. No pair of stations will be repeated. The input will be terminated by the line `-1 -1 -1`.

You should output s lines, the i^{th} containing the frequency you have assigned to the i^{th} station.

SAMPLE OUTPUT

```
1
3
1
3
```