

bluetooth

After 3 weeks of attempting to order one and one week of delivery, you have finally received a new Nexus 298 from Moogle. Unfortunately, as you happily go about prodding at the various functions in your new phone, you accidentally transmit a Bluetooth packet to an unknown device. Oh no!

You decide to track the distribution of the packet across the Bluetooth network. The network consists of N Bluetooth devices ($2 \leq N \leq 10000$), each labelled 0 - $(N-1)$. Upon receiving a packet, a device forwards it to all connected devices. Your device, the “starting point”, is always device 0 . Also, a device can receive a maximum of K packets ($1 \leq K \leq N$), and the packet can be present on at most N devices.

The time taken for a packet to reach a device is dependent on the distance between it and the source, with 1 unit of time taken to travel 1 unit of distance. You are given a list of E unidirectional connections ($N-1 \leq E \leq 2N$), specifying their start, end and distance.

Given Q queries ($1 \leq Q \leq 200$), find the position of each queried device in the order of devices to receive packets. (e.g. if device 5 is the 3rd to receive a packet, print 3.) If a device receives a packet more than once, print all of its positions. (e.g. if device 5 is the 3rd and 5th to receive a packet, print 3 5.) If two devices receive packets at the same time, the device with the greater number receives it first.

Input:

Line 1: 3 digits N , E , K and Q .

Lines 2 to $(E + 1)$: 3 digits $A[i]$, $B[i]$ and $L[i]$, denoting the start, end and length of connection i . $L[i]$ is guaranteed to fit within a signed 32-bit integer.

Example Input:

```
5 4 2 3
0 2 2
2 1 5
1 2 3
0 3 11
2
1
4
```

Example Output:

```
1 3
2
-1
```

Example Explanation:

Starting with device 0, a packet is sent to connected devices 2 and 3. Device 2 then receives the packet after 2 units of time and sends it to device 1, taking 5 units of time. After that, device 1 sends the packet back to device 2 over 3 units of time. Finally, device 3 receives the packet from device 0, which took 11 units of time to arrive. The packet does not travel to device 1 again as it can only be present on 5 devices. Hence, the distribution is as follows: 0 (source), 2, 1, 2, 3.

Device 2 received packets twice: once in the first place, and once in the third.

Device 1 received a packet only once in the second place.

Device 4 did not receive a packet.

Subtask 1 (5%): $E = N - 1$, $K = 1$. Every point will be connected to point 0.

Subtask 2 (35%): $Q = 1$.

Subtask 3 (60%): No further constraints.

Subtask 4 (0%): Sample.