Communication Network 2

A communication network consists of N computers and links. The computers are numbered from 0 to $N-1$. A single link allows two distinct computers to communicate bidirectionally. That is, the communication network is an undirected graph with N vertices, and each link acts as an edge connecting two distinct vertices. Initially, there are no links in the communication network.

Every second, multiple links are added to or removed from the communication network. Specifically, for every $u = 0, 1, 2, \cdots, T-1$, a set of distinct links E_u is given. At time $u + 0.5$, the links in the communication network are updated according to the following rules:

- If a link in E_u did not exist in the existing communication network, add this link to the communication network.
- If a link in E_u exists in the existing communication network, remove this link from the communication network.

For any integer t and two computers a and b, computers a and b are said to be *connected at time* t if there exists a path connecting computer a and computer b using only the links present in the communication network at time t. If $a = b$, this is known to be always true regardless of the link configuration of the communication network.

Furthermore, for any integers $0 \le l \le r \le T$ and two computers a and b, computers a and b are said to be *connected from time* l *to* r if computers a and b are connected at time t for all $t = l, l+1, \cdots, r$.

To study which computers can stably communicate with others during a specific time interval, you want to ask the following Q queries:

- Given computer x and time interval l, r, return the number of computers y such that computer x and y are connected from time l to r. ($0 \le x \le N-1; 0 \le l \le r \le T; 0 \le y \le N-1$)

Function List and Definition

You should implement the following function.

```
vector<int> count_computers(int N, int T, int Q, vector<vector<array<int,
2>>> E, vector<array<int, 3>> F)
```

- E: An array representing the sets of links added or removed. The size of E is T. Each $E[i]$ is an array consisting of 1 or more distinct links, representing the set E_i. Each link is given as an array of size 2, where the elements are $[a, b]$ in order. This means the link connects computers a and b.
- F: An array representing the queries. The size of F is Q. For all i $(0 \le i \le Q-1)$, $F[i]$ represents the i-th query. A query is given as an array of size 3. The elements are $[x, l, r]$ in order. Here, x

represents the computer, and l, r represent the time interval.
- This function must return an integer array R of size Q. For all j $(0 \le j \le Q-1)$, $R[j]$ stores the answer to the j-th query.
- This function is called exactly once.

The submitted source code must not execute any input/output functions in any part.

Constraints

- $2 \le N \le 100\,000$
- $1 \le T \le 100\,000$
- $1 \le Q \le 250\,000$
- E_i consists of distinct links.
- Let S be the sum of the sizes of all E_i $(0 \le i \le T-1)$. Then $S \le 100\,000$
- For every link given in the input, $0 \le a < b \le N-1$.
- For every query given in the input, $0 \le x \le N-1, 0 \le l \le r \le T$.

Subtasks

Number	Points	Constraints
1	5	$N, S, Q \le 100$
2	12	$N, S, Q \le 5\,000$
3	19	For all queries, $l = r$
4	23	For every link $[a, b]$ included in E, $\lvert a-b \rvert = 1$
5	41	No additional constraints.

Example

Consider the following call.

```
count_computers(4, 5, 7, [[[0, 1], [1, 2]], [[2, 3], [1, 3]], [[0, 1], [0, 3]], [[0, 1], [1, 2], [0, 3], [2, 3]], [[1, 3]]], [[1, 1, 1], [2, 2, 2], [3, 3, 3], [0, 0, 5], [2, 1, 3], [1, 1, 4], [3, 2, 3]])
```

There are 4 computers in the communication network.

At every time, the link configuration of the communication network is as follows:

- At time 0: 0 links.
- At time 1: 2 links: $(0, 1)$, $(1, 2)$.
- At time 2: 4 links: $(0, 1)$, $(1, 2)$, $(2, 3)$, $(1, 3)$.
- At time 3: 4 links: $(1, 2)$, $(2, 3)$, $(1, 3)$, $(0, 3)$.
- At time 4: 2 links: $(0, 1)$, $(1, 3)$.
- At time 5: 1 link: $(0, 1)$.

A total of 7 queries are given:

- Query 0: At time 1, computer 1 is connected to computers $\{0, 1, 2\}$.
- Query 1: At time 2, computer 2 is connected to computers $\{0, 1, 2, 3\}$.
- Query 2: At time 3, computer 3 is connected to computers $\{0, 1, 2, 3\}$.
- Query 3: Since no links exist at time 0, computer 0 is connected only to computer 0 from time 0 to 5.
- Query 4: From time 1 to 3, computer 2 is connected to computers $\{0, 1, 2\}$.
- Query 5: From time 1 to 4, computer 1 is connected to computers $\{0, 1\}$.
- Query 6: From time 2 to 3, computer 3 is connected to computers $\{0, 1, 2, 3\}$.

Thus, the function should return $[3, 4, 4, 1, 3, 2, 4]$.

Sample Grader

The input format of the sample grader is as follows. $|E_i|$ denotes the size of the set E_i, and $S = \sum_{0 \le j \le T-1} |E_j|$.

- line 1: $N\ T\ Q$
- For all $0 \le i \le T - 1$:
  - line $2 + \sum_{0 \le j < i}(1 + |E_j|)$: $|E_i|$
  - line $2 + \sum_{0 \le j < i}(1 + |E_j|) + k + 1$ $(0 \le k \le |E_i| - 1)$: $a\ b$ (The two endpoints of the k-th edge in E_i)
- line $2 + S + T + i$ $(0 \le i \le Q - 1)$: $x\ l\ r$ (Each element of $F[i]$)

The sample grader outputs the answer in the following format:

- line $1 + i$ $(0 \le i \le Q - 1)$: $R[i]$