Gandhi and the Railway Ministry

Submit solution

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Points: 100 (partial)
Time limit: 2.0s
Memory limit: 256M

Author:
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Problem type

Allowed languages
C, C++

Gandhi and the Railway Ministry

Gandhi, the Prime Minister of India, has received several proposals from the Railway Ministry about opening new high-speed train routes across the country. India has **n** cities numbered from 1 to **n**, where city 1 is the **national capital**. In addition to the train proposals, the country already has **m** bidirectional roads connecting various pairs of cities. The *i*-th road connects city `u_i` and city `v_i` and has a length of `x_i`.

The Railway Ministry has also proposed **k** new train routes. The *i*-th train route connects the capital (city 1) directly to city `s_i` with a travel length of `y_i`. These train routes can be used in both directions.

Gandhi wants to ensure that while modernizing the transport network, **no city ends up with a longer minimum travel distance to the capital** than it already has. Therefore, he has decided that some of the proposed train routes might be unnecessary if the current network already provides the shortest possible paths. Help Gandhi by determining the **maximum number of proposed train routes that can be rejected** such that the shortest distance from every city to the capital remains unchanged.

Input

Input Format

- The first line contains three integers `n`, `m`, and `k`:
  - `n` — the number of cities
  - `m` — the number of roads

$1 \le m \le 3 \cdot 10^5$
$1 \le k \le 10^5$

- The next m lines each contain three integers u_i, v_i, and x_i:
  - A bidirectional road between city u_i and city v_i
  - With a road length of x_i
  - Constraints:
    $1 \le u_i, v_i \le n$, $u_i \ne v_i$
    $1 \le x_i \le 10^9$
- The next k lines each contain two integers s_i and y_i:
  - A proposed train route from the **capital** (city 1) to city s_i
  - With a train route length of y_i
  - Constraints:
    $2 \le s_i \le n$
    $1 \le y_i \le 10^9$ train routes.

It is guaranteed that every city is reachable from the capital.
Note: There can be **multiple roads** between two cities and **multiple train routes** going to the same city.
Ensure that the given input is in the range specified.

Output

Output a single integer — the **maximum number of train routes** that Gandhi can reject (i.e., not build) **without affecting the shortest path distance** from any city to the capital.

Sample Test Cases

Sample Test Case 1

Input:

Copy

```
5 5 3
1 2 1
2 3 2
1 3 3
3 4 4
1 5 5
3 5
4 5
5 5
```

```
2
```

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Sample Test Case 2

Input:

```
2 2 3
1 2 2
2 1 3
2 1
2 2
2 3
```

Copy

Output:

```
2
```

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Clarifications

Request clarification

No clarifications have been made at this time.