8018 Kingdom of Chef

Chef lives in a country represented by cities numbered from 1 to N and connected to each other via bidirectional weighted paths in such a way that there is a unique path between any pair of cities.

Chef has aims to conquer a subset of these cities and form his Kingdom. He can choose a subset of nodes v_1, v_2, ..., v_k and his followers will occupy those cities to make initial kingdom consisting of those cities. Also, any city which lies on a path between any two occupied cities will be eventually occupied and will become a part of Chef's the Kingdom.

To evaluate how good or favorable the Kingdom is, Chef defines a function. Say, if the cities in Chef's Kingdom are c_1, c_2, ..., c_n, then Chef defines goodness of this kingdom as $f(c_1) + f(c_2) + \cdots + f(c_n)$, where $f(x)$ is defined as the minimum distance a person has to travel to visit all the cities in the Kingdom at least once, if he/she starts at city number x.

Now, Chef has a total of Q plans about which cities he want to occupy, i-th of the plan is defined by a subset of K_i cities, $v_{i,1}$, $v_{i,2}$, ..., v_{i,K_i}, denoting the initial cities that his followers will occupy. He wants you to report the goodness of the Kingdoms eventually formed by his plans.

Input

The input file contains several test cases, each of them as described below.

The first line of the input contains two space separated integers N and Q denoting the number of cities and number of Chef's plans, respectively.

Next $N - 1$ lines contain integers u, v and w denoting there is a bidirectional path of length w between cities numbered u and v.

Each of the next Q lines describe Chef's plans. Each plan first states K_i, i.e. number of cities in the i-th plan. Next K_i integers denote the cities to be occupied in this plan.

Output

For each test case, the output must follow the description below.

For each plan of Chef, output in one line the goodness of the Kingdom formed by that plan.

Constraints:

- $1 \leq N, Q \leq 10^5$
- $1 \leq u, v \leq N$
- $1 \leq w \leq 10^4$
- $1 \leq K_i \leq N$
- $1 \leq Sum\ of\ K_i\ for\ all\ i \leq 5 * 10^5$
- $1 \leq v_{i,j} \leq N$ for all i, j

Explanation:

Plan 1: Chef plans to occupy only city 1, in which case goodness is 0.

Plan 2: Chef initially occupies cities 1 and 2. Eventually, no other city other than these two is occupied. For each city in kingdom formed, a person will need to travel at most 1 distance to visit all the cities.

Plan 3: Chef initially occupies city 3 and 4. However, city 1 and 2 lie on a path between initial occupied cities and therefore, belong to Chef's kingdom.

Let's see how goodness of Chef's kingdom is calculated.

- $f(1)$ is 9. Path $1 \to 2 \to 3 \to 2 \to 1 \to 4$ is one of the paths which can be taken.
- $f(2)$ is 8. Path $2 \to 3 \to 2 \to 1 \to 4$ is the path which needs to be taken.
- $f(3)$ is 6. Path $3 \to 2 \to 1 \to 4$ is the path which needs to be taken.
- $f(4)$ is 6. Path $4 \to 1 \to 2 \to 3$ is the path which needs to be taken.

Therefore, answer is $9 + 8 + 6 + 6 = 29$.

Sample Input

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

Sample Output

```
0
2
29
0
2
29
```