Super Maximum Cost Queries

HackerRank

Victoria has a tree, T, consisting of N nodes numbered from 1 to N. Each edge from node U_i to V_i in tree T has an integer weight, W_i.

Let's define the cost, C, of a path from some node X to some other node Y as the maximum weight (W) for any edge in the unique path from node X to node Y.

Victoria wants your help processing Q queries on tree T, where each query contains 2 integers, L and R, such that $L \leq R$. For each query, she wants to print the number of different paths in T that have a cost, C, in the inclusive range $[L, R]$.

It should be noted that path from some node X to some other node Y is considered same as path from node Y to X i.e $\{X, Y\}$ is same as $\{Y, X\}$.

Input Format

The first line contains 2 space-separated integers, N (the number of nodes) and Q (the number of queries), respectively.
Each of the $N - 1$ subsequent lines contain 3 space-separated integers, U, V, and W, respectively, describing a bidirectional road between nodes U and V which has weight W.
The Q subsequent lines each contain 2 space-separated integers denoting L and R.

Constraints

- $1 \leq N, Q \leq 10^5$
- $1 \leq U, V \leq N$
- $1 \leq W \leq 10^9$
- $1 \leq L \leq R \leq 10^9$

Scoring

- $1 \leq N, Q \leq 10^3$ for 30% of the test data.
- $1 \leq N, Q \leq 10^5$ for 100% of the test data.

Output Format

For each of the Q queries, print the number of paths in T having cost C in the inclusive range $[L, R]$ on a new line.

Sample Input

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

```
2 5 6
3 4 1
1 1
1 2
2 3
2 5
1 6
```

Sample Output

```
1
3
5
5
10
```

Explanation

$Q_1: \{3, 4\}$
$Q_2: \{1, 3\}, \{3, 4\}, \{1, 4\}$
$Q_3: \{1, 4\}, \{1, 2\}, \{2, 4\}, \{1, 3\}, \{2, 3\}$
$Q_4: \{1, 4\}, \{1, 2\}, \{2, 4\}, \{1, 3\}, \{2, 3\}$
...etc.