Problem I. Intellectual Prefix Maxima

Input file:	*standard input*
Output file:	*standard output*
Time limit:	4 seconds
Memory limit:	512 mebibytes

A tree is an undirected graph in which any two vertices are connected by exactly one path. You are given a weighted tree with n vertices, where $w(i, j)$ is weight of an edge between vertices i and j. Consider a simple path $P = (u, s_1, \ldots, s_{t-1}, v)$ from vertex u to vertex v. Denote the sequence of weights of the edges on path P by $a = (a_1, a_2, \ldots, a_t)$, where $a_1 = w(u, s_1)$, $a_2 = w(s_1, s_2)$, $\ldots$, $a_t = w(s_{t-1}, v)$.

Let $f(u, v) = \sum_{i=1}^{t} \max_{j=1..i} \{a_j\}$ be the sum of prefix maxima on a. You are given q queries, each of them is described with two integers, u and v. For each query, you need to compute $f(u, v)$.

Input

The first line contains two integers n and q ($1 \le n \le 2 \cdot 10^5$, $1 \le q \le 10^6$) separated by a single space: the number of vertices in the tree and the number of queries.

Each of the next $n - 1$ lines contains three integers, a_i, b_i, and c_i ($1 \le a_i, b_i \le n$, $a_i \ne b_i$, $1 \le c_i \le 10^9$): the vertices connected by the i-th edge and its weight. It is guaranteed that the given edges form a tree.

Each of the next q lines contains two integers u_i and v_i ($1 \le u_i, v_i \le n$): the i-th query.

Output

Print q lines, the i-th of them should contain a single integer: the answer to the i-th query.

Example

standard input	standard output
5 4 1 2 2 2 3 1 3 4 3 3 5 4 1 4 1 5 4 2 5 2	7 8 6 8