Problem E. Tower Defense

Input file:	`standard input`
Output file:	`standard output`
Time limit:	5 seconds
Memory limit:	1024 megabytes

The road network of Byteland kingdom consists of n cities numbered from 1 to n, connected with $n-1$ bidirectional roads. Each road has length 1. The road network is connected and its graph forms a tree.

There are m military towers in the kingdom. The i-th of them is situated in the city a_i and has region of protection with radius r_i. A city v is *protected* by the tower i if the travelling distance between v and a_i doesn't exceed r_i.

King of Byteland is going to choose one of the cities as the new capital. The capital should be protected by **all** towers. The king can invest in extending protection of any existing tower. Increasing the radius of protection of any tower by any non-negative integer x costs $\lceil \frac{x}{k} \rceil$ coins. Find the smallest total amount of coins the king has to spend so that the capital protected by all towers can be chosen.

Input

The first line contains three integers n, m, k ($1 \le n, m \le 10^5$, $1 \le k \le 10$) — the number of cities, the number of towers, and the divisor for payment function respectively.

The next $n-1$ lines describe the roads. The i-th of these contains three integers u_i, v_i ($1 \le u_i, v_i \le n$) — indices of cities connected by the i-th road. It is guaranteed that the given graph is a tree.

The next m lines describe the towers. The i-th of these lines contains two integers a_i, r_i ($1 \le a_i \le n$, $0 \le r_i \le 10^9$) — the index of the city where the i-th tower is situated, and the radius of its protection.

Output

Print one integer — the smallest amount of coins needed to spend on tower upgrades so that a new capital can be chosen.

Examples

standard input	standard output
3 2 1 1 2 2 3 1 1 3 0	1
5 2 1 1 2 2 3 3 4 4 5 1 0 5 0	4
6 2 2 1 2 2 3 3 4 4 5 5 6 1 0 6 2	2