

Problem F. Escape The Maze

Input file: **standard input**
Output file: **standard output**
Time limit: 8 seconds
Memory limit: 512 megabytes

Alice is currently trapped in a maze, which can be seen as a tree. Each edge in the tree has a weight representing the length of that edge. The leaves of the tree represent the exits, and when Alice reaches a leaf, it means she has successfully escaped from the maze.

A leaf is defined as a node with degree 1 that is not the root.

Each maze has a difficulty level, denoted as L . When Alice is at a node x in the tree, she can choose to jump to a node y in her subtree. Let s be the sum of the edge weights along the path from x to y . The energy spent when jumping from x to y is $(s - L)^2$.

Alice wants to know the minimum amount of energy required to escape the maze if the tree has p as the root and she starts from p . Alice will ask this question a total of Q times.

The data guarantees that for any given pair of points x and y , the absolute value of the sum of edge weights s along the path between them does not exceed 10^9 .

Input

The input consists of multiple test cases. The first line contains a single integer T ($1 \leq T \leq 5$) — the number of test cases. Description of the test cases follows.

The first line of each test case contains two integers n, L ($3 \leq n \leq 10^5, -10^5 \leq L \leq 10^5$) — the number of nodes in the tree.

Each of the next $n - 1$ lines contains three integers u, v, w ($1 \leq u, v \leq n, u \neq v, -10^5 \leq w \leq 10^5$).

The next line contains a positive integer Q ($1 \leq Q \leq 10$).

Each of the next Q lines contains one integer p ($1 \leq p \leq n$) asks the minimum amount of energy required to escape the maze if the tree has p as the root and she starts from p .

It is guaranteed that the given graph is a tree.

Output

For each test case, output Q lines. Each line should contain a integer indicating the minimum amount of energy required.

The data guarantees that the answer will not exceed the range that can be represented by a 64-bit signed integer.

Example

standard input	standard output
1	9
4 2	1
1 2 5	0
1 3 -4	0
1 4 6	
4	
1	
2	
3	
4	