Problem C. SlavicG's Favorite Problem

Time limit 2000 ms
Mem limit 262144 kB

You are given a weighted tree with n vertices. Recall that a tree is a connected graph without any cycles. A weighted tree is a tree in which each edge has a certain weight. The tree is undirected, it doesn't have a root.

Since trees bore you, you decided to challenge yourself and play a game on the given tree.

In a move, you can travel from a node to one of its neighbors (another node it has a direct edge with).

You start with a variable x which is initially equal to 0. When you pass through edge i, x changes its value to x XOR w_i (where w_i is the weight of the i-th edge).

Your task is to go from vertex a to vertex b, but you are allowed to enter node b if and only if after traveling to it, the value of x will become 0. In other words, you can travel to node b only by using an edge i such that x XOR $w_i = 0$. Once you enter node b the game ends and you win.

Additionally, you can teleport **at most once** at any point in time to any vertex except vertex b. You can teleport from any vertex, even from a.

Answer with "YES" if you can reach vertex b from a, and "NO" otherwise.

Note that XOR represents the bitwise XOR operation.

Input

The first line contains a single integer t ($1 \le t \le 1000$) — the number of test cases.

The first line of each test case contains three integers n, a, and b ($2 \le n \le 10^5$), ($1 \le a, b \le n$; $a \ne b$) — the number of vertices, and the starting and desired ending node respectively.

Each of the next $n - 1$ lines denotes an edge of the tree. Edge i is denoted by three integers u_i, v_i and w_i — the labels of vertices it connects ($1 \le u_i, v_i \le n$; $u_i \ne v_i$; $1 \le w_i \le 10^9$) and the weight of the respective edge.

It is guaranteed that the sum of n over all test cases does not exceed 10^5.

Output

For each test case output "YES" if you can reach vertex b, and "NO" otherwise.

Sample 1

Input	Output
3 5 1 4 1 3 1 2 3 2 4 3 3 3 5 1 2 1 2 1 2 2 6 2 3 1 2 1 2 3 1 3 4 1 4 5 3 5 6 5	YES NO YES

Note

For the first test case, we can travel from node 1 to node 3, x changing from 0 to 1, then we travel from node 3 to node 2, x becoming equal to 3. Now, we can teleport to node 3 and travel from node 3 to node 4, reaching node b, since x became equal to 0 in the end, so we should answer "YES".

For the second test case, we have no moves, since we can't teleport to node b and the only move we have is to travel to node 2 which is impossible since x wouldn't be equal to 0 when reaching it, so we should answer "NO".