Problem I. A Possible Tree

Alice knows that Bob has a secret tree (in terms of graph theory) with n nodes with $n-1$ weighted edges with integer values in $[0, 2^{60}-1]$. She knows its structure but does not know the specific information about edge weights.

Thanks to the awakening of Bob's conscience, Alice gets m conclusions related to his tree. Each conclusion provides three integers u, v and val saying that the exclusive OR (XOR) sum of edge weights in the unique shortest path between u and v is equal to val.

Some conclusions provided might be wrong and Alice wants to find the maximum number W such that the first W given conclusions are compatible. That is say that at least one allocation of edge weights satisfies the first W conclusions all together but no way satisfies all the first $W+1$ conclusions (or there are only W conclusions provided in total).

Help Alice find the exact value of W.

Input

The input has several test cases and the first line contains an integer t ($1 \le t \le 30$) which is the number of test cases.

For each case, the first line contains two integers n ($1 \le n \le 100000$) and c ($1 \le c \le 100000$) which are the number of nodes in the tree and the number of conclusions provided. Each of the following $n-1$ lines contains two integers u and v ($1 \le u, v \le n$) indicating an edge in the tree between the u-th node and the v-th node. Each of the following c lines provides a conclusion with three integers u, v and val where $1 \le u, v \le n$ and $val \in [0, 2^{60}-1]$.

Output

For each test case, output the integer W in a single line.

Example

standard input	standard output
2 7 5 1 2 2 3 3 4 4 5 5 6 6 7 1 3 1 3 5 0 5 7 1 1 7 1 2 3 2 7 5 1 2 1 3 1 4 3 5 3 6 3 7 2 6 6 4 7 7 6 7 3 5 4 5 2 5 6	3 4