

8476 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 ($1 \leq t \leq 30$) which is the number of test cases.

For each case, the first line contains two integers n ($1 \leq n \leq 100000$) and c ($1 \leq c \leq 100000$) 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 ($1 \leq u, v \leq n$) 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 $1 \leq u, v \leq n$ and $val \in [0, 2^{60}-1]$.

Output

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

Sample Input

```
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

Sample Output

3
4