

Question 1

Largest power of 10

You are given a tree of N nodes. All the nodes are labeled uniquely from 1 to N . Each edge in the tree has some weight associated with it.

You are given Q queries. In each query, you are given two integers u and v . Your task is to determine the largest power of 10 that perfectly divides the product of the weight of all the edges in the path from u to v .

In other words, find the largest value of x such that the product of the weight of all the edges in the path from u to v is perfectly divisible by 10^x .

Note

- All the edges in the tree are undirected and weighted.
- A number n is perfectly divisible by d if it leaves the remainder as 0 after dividing n by d .

Input format

- The first line contains two space-separated integers N and Q .
- Each of the next $N - 1$ lines contains three space-separated integers a , b , and c denoting that there is an edge between node a and node b and the weight of the edge is c .
- Each of the next Q lines contains two space-separated integers u and v .



Output format

Print Q number of lines where the i^{th} line contains the single integer denoting the answer to the i^{th} query.

Constraints

$$2 \leq N \leq 10^5 \quad 1 \leq Q \leq 10^5 \quad 1 \leq a, b \leq N \quad 1 \leq c \leq 10^{16} \quad 1 \leq u, v \leq N \quad u \neq v$$

- All the edges are valid and form a valid tree.

Sample input 1

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```
7 8
1 2 8
2 3 15
5 6 6
4 2 7
7 5 30
1 5 10
3 5
2 7
1 6
```

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Sample output 1

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```
2
2
1
3
1
1
0
2
```