C. Digit Tree

time limit per test: 3 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

ZS the Coder has a large tree. It can be represented as an undirected connected graph of n vertices numbered from 0 to $n - 1$ and $n - 1$ edges between them. There is a single **nonzero** digit written on each edge.

One day, ZS the Coder was bored and decided to investigate some properties of the tree. He chose a positive integer M, which is **coprime** to 10, i.e. .

ZS consider an **ordered pair** of distinct vertices (u, v) *interesting* when if he would follow the shortest path from vertex u to vertex v and write down all the digits he encounters on his path in the same order, he will get a decimal representaion of an integer divisible by M.

Formally, ZS consider an ordered pair of distinct vertices (u, v) interesting if the following states true:

- Let $a_1 = u, a_2, ..., a_k = v$ be the sequence of vertices on the shortest path from u to v in the order of encountering them;
- Let d_i $(1 \le i < k)$ be the digit written on the edge between vertices a_i and a_{i+1};
- The integer is divisible by M.

Help ZS the Coder find the number of interesting pairs!

Input

The first line of the input contains two integers, n and M $(2 \le n \le 100\,000,\ 1 \le M \le 10^9,\ )$ — the number of vertices and the number ZS has chosen respectively.

The next $n - 1$ lines contain three integers each. i-th of them contains u_i, v_i and w_i, denoting an edge between vertices u_i and v_i with digit w_i written on it $(0 \le u_i, v_i < n,\ \ 1 \le w_i \le 9)$.

Output

Print a single integer — the number of interesting (by ZS the Coder's consideration) pairs.

Examples

input

```
6 7
0 1 2
4 2 4
2 0 1
3 0 9
2 5 7
```

output

```
7
```

input

```
5 11
1 2 3
2 0 3
3 0 3
4 3 3
```

output

```
8
```

Note

In the first sample case, the interesting pairs are $(0, 4), (1, 2), (1, 5), (3, 2), (2, 5), (5, 2), (3, 5)$. The numbers that are formed by these pairs are $14, 21, 217, 91, 7, 7, 917$ respectively, which are all multiples of 7. Note that $(2, 5)$ and $(5, 2)$ are considered different.

In the second sample case, the interesting pairs are $(4, 0), (0, 4), (3, 2), (2, 3), (0, 1), (1, 0), (4, 1), (1, 4)$, and 6 of these pairs give the number 33 while 2 of them give the number 3333, which are all multiples of 11.