

## E. 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  $a_1 = u, a_2, \dots, a_k = v$  be the sequence of vertices on the shortest path from  $u$  to  $v$  in the order of encountering them;
- Let  $d_i$  ( $1 \leq i < k$ ) 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  $M$  ( $2 \leq n \leq 100\,000$ ,  $1 \leq M \leq 10^9$ , ) — 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 ( $0 \leq u_i, v_i < n$ ,  $1 \leq w_i \leq 9$ ).

### 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.