

## Problem E. XorTree

Input file: *standard input*  
Output file: *standard output*  
Time limit: 2 seconds  
Memory limit: 256 mebibytes

You are given a tree with  $N$  vertices. The vertices are numbered 0 through  $N - 1$ , and the edges are numbered 1 through  $N - 1$ . Edge  $i$  connects vertex  $x_i$  and  $y_i$ , and has a value  $a_i$ . You can perform the following operation any number of times: choose a simple path and a non-negative integer  $x$ , then for each edge  $e$  that belongs to the path, change  $a_e$  by executing  $a_e := a_e \oplus x$  ( $\oplus$  denotes *XOR*).

Your objective is to have  $a_e = 0$  for all edges  $e$ . Find the minimum number of operations required to achieve it.

### Input

Input is given in the following format:

```
N
x1 y1 a1
x2 y2 a2
...
xN-1 yN-1 aN-1
```

Constraints:

$2 \leq N \leq 10^5$ ,  $0 \leq x_i, y_i \leq N - 1$ ,  $0 \leq a_i \leq 15$ . The given graph is a tree, all input values are integers.

### Output

Find the minimum number of operations required to achieve the objective.

### Examples

| standard input                        | standard output |
|---------------------------------------|-----------------|
| 5<br>0 1 1<br>0 2 3<br>0 3 6<br>3 4 4 | 3               |
| 2<br>1 0 0                            | 0               |

### Note

In Sample 1, the objective can be achieved in three operations, as follows: first, choose the path connecting Vertex 1, 2, and  $x = 1$ , then, choose the path connecting Vertex 2, 3, and  $x = 2$ ; lastly, choose the path connecting Vertex 0, 4, and  $x = 4$ .