Trading duopoly

During one of his distant voyages in his youth, Piotr arrived in a strange country with N towns (quite strangely) numbered from 1 to N.

He noticed that the system of roads is such that there is only one path (consisting of roads between various towns and going twice on any road) between any two towns. i-th road goes from town u_i to v_i and is w_i kilometres long.

Two major trading companies Poltrade and Tradex want to split the towns between themselves so that they don't sell their products together in the same city (and all the cities are provided by the products of one of them).

However, there is a superstition in this country that travelling even number of kilometres gives you luck.

Therefore, each company wants to obtain such a set of towns that the (only) path between any two of them has even number of kilometres.

Help Piotr solve the problem of the two companies and propose a split of the towns between the two companies satisfying the above condition. It can be proven that at least one such split is possible under the constraints of the problem.

Constraints

- All values in input are integers.
- $1 \leq N \leq 10^5$
- $1 \leq u_i < v_i \leq N$
- $1 \leq w_i \leq 10^9$

Input

Input is given from Standard Input in the following format:

```
N
u_1 v_1 w_1
u_2 v_2 w_2
.
.
.
u_{N-1} v_{N-1} w_{N-1}
```

Output

Print a split of the towns that satisfies the condition, in N lines. The i-th line should contain 0 if town i belongs to Poltrade and 1 if it belongs to Tradex. In case of many splits being possible, any valid split will be accepted.

Example

Input	Output
3 1 2 2 2 3 1	0 0 1
5 2 5 2 2 3 10 1 3 8 3 4 2	1 0 1 0 1