H House Numbering

Time limit: 4s

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You are addicted to the latest world-simulation game: Building A Perfect City. In your current play-through, you have created a city that has an equal number of streets and intersections. All that is left is to number the houses in every street.

The city is represented by a connected graph with intersections and streets. Every street is a connection between two intersections u and v, and has h houses which are all on one side of the street. There is at most one street between two intersections. There are two ways to number the houses in this street: either you start with house number 1 adjacent to intersection u and end with house number h at intersection v, or house number 1 is adjacent to v and house number h is adjacent to u. To avoid confusion, you want to ensure that no intersection has two adjacent houses with the same number.

Find a way to number the houses in every street that satisfies this property (or report that it is impossible).

Input

The input consists of:

- One line with an integer n ($3 \leq n \leq 10^5$), the number of intersections and number of streets.
- n lines with three integers u, v, and h ($u \neq v$, $1 \leq u, v \leq n$, $2 \leq h \leq 10^9$) representing a street between intersections u and v that has h houses.

It is guaranteed that every intersection is reachable from every other intersection. There is at most one street between any two intersections.

Output

If it is impossible, output "`impossible`". Otherwise, output for each street (in the same order as the input) a number representing the intersection where the house numbering starts.

If there are multiple valid solutions, you may output any one of them.

Sample Input 1	Sample Output 1
3 1 2 2 2 3 9 3 1 3	1 2 3

Sample Input 2	Sample Output 2

<pre>4
1 2 2
1 3 2
2 3 2
1 4 2</pre>
	<pre>impossible</pre>