



Problem B. Boredom

Mohammad and Mahdi are computer science students. On Christmas Eve they are bored lonely at home, so Mohammad suggests a game to play with their magical Christmas tree. As they love computer science, they consider their Christmas tree as a graph. If Mahdi cuts one edge, all nodes that are connected to the root through this edge disappear. Each time Mohammad hangs the tree from one node of the tree and asks Mahdi to count the number of branches he can cut without changing the height of the tree. This continues until all the nodes have been the root of the tree once. Mahdi is tired of the game, so he wants you to tell him the answer for all the nodes Mohammad hangs the tree from to get rid of Mohammad's game sooner.

Input

The first line contains a single integer n . ($1 \leq n \leq 10^5$)

Each of the next $n - 1$ lines contain two integers representing two nodes that share an edge.

Output

Print n lines, on line i Mahdi's answer when node i is the root.

Examples

test	answer
3	0
1 2	2
2 3	0
4	3
1 2	2
1 3	2
1 4	2
5	3
1 2	2
1 3	2
2 4	1
2 5	1