

HOME TOP CATALOG CONTESTS GYM PROBLEMSET GROUPS RATING EDU API CALENDAR HELP

PROBLEMS SUBMIT CODE MY SUBMISSIONS STATUS STANDINGS CUSTOM INVOCATION

B. Dynamic Diameter

time limit per test: 3 seconds memory limit per test: 256 megabytes

You are given n+1 nodes and n-1 edges where the first n nodes are a tree and node n+1 is in its own component. For each node i from $1 \dots n$, answer the following question:

If an edge was added from node i to node n+1, what would the diameter of the created tree be? (Notice that the n+1 nodes will be a tree if this edge was added).

Input

The first line will contain a single integer n, the number of nodes in the tree initial tree. n-1 lines follow, each containing two different integers, describing the edges initially in the tree. Additional constraint on input: these edges will form a tree on the first n nodes.

 $1 \leq n \leq 3*10^5$

Output

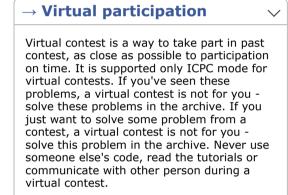
Print n integers, each on their own line. The ith is the diameter of the new tree if you were to add an edge from node i to node n+1.

Examples



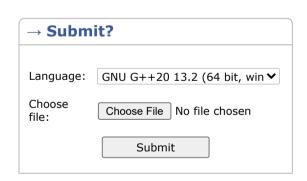
AlgorithmsThread Tree Basics Contest Finished Practice







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ightarrow Last submissions		
Submission	Time	Verdict
320691337	May/21/2025 22:02	Accepted
320690472	May/21/2025 21:50	Accepted
317789048	Apr/30/2025 02:57	Accepted
317668685	Apr/28/2025 22:18	Accepted
317667324	Apr/28/2025 22:03	Accepted
317667194	Apr/28/2025 22:02	Runtime error on test 2
317661966	Apr/28/2025 21:05	Accepted
317661919	Apr/28/2025 21:04	Runtime error on test 1