

## Problem E. Smaller LCA

Input file: *standard input*  
Output file: *standard output*  
Time limit: 4 seconds  
Memory limit: 1024 mebibytes

Grammy has a tree with vertices numbered from 1 to  $n$ . For each vertex as the root, she wants to know how many unordered pairs of points  $(x, y)$  have their lowest common ancestor  $z$  satisfy the inequality  $z \leq x \cdot y$ . Please count it for her.

### Input

The first line contains a single integer  $n$  ( $1 \leq n \leq 300\,000$ ), denoting the number of vertices of the tree. Each of the next  $n - 1$  lines contains two integers  $u_i$  and  $v_i$  ( $1 \leq u_i, v_i \leq n$ ), indicating that there is an edge between vertex  $u_i$  and vertex  $v_i$ . It is guaranteed that the given graph is a tree.

### Output

Output  $n$  lines. The  $i$ -th line must contain a single integer: the number of pairs satisfying the condition when vertex  $i$  is the root.

### Example

standard input	standard output
5	15
1 2	15
4 2	15
2 5	15
3 5	14