Problem B. Permutation Tree

Time limit	2000 ms
Mem limit	262144 kB
OS	Windows

You are given a tree T with n vertices. Edge i $(1 \leq i \leq n-1)$ connects vertices u_i and v_i, T is rooted at x $(1 \leq x \leq n)$

You have to construct the lexicographically smallest n-permutation p such that the following condition holds:

- If u is an ancestor to v, $p_u < p_v$.

Note: Ancestors of the vertex u are all vertices on the path from the root x to the vertex u , except the vertex u itself.

Input

The first line contains integers n and x $(2 \leq n \leq 2 \cdot 10^5)$ — the number of vertices in the tree and the root.

The next $n-1$ lines contain integers u_i and v_i $(1 \leq v_i, u_i \leq n)$ — the vertices that the i-th edge connects.

It is guaranteed that this set of edges forms a tree.

Output

The lexicographically smallest n-permutation that satisfies the given condition

Sample 1

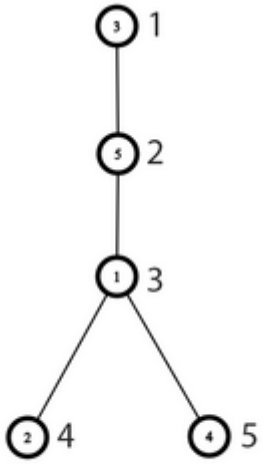
Input	Output
5 3 3 5 1 5 1 2 4 1	3 4 1 5 2

Sample 2

Input	Output
10 3 5 4 8 3 4 6 5 3 7 9 1 3 5 10 2 9 9 8	2 5 1 7 6 8 9 3 4 10

Note

For the first example:



For the second example: