

F. LCA Game (LCA)

Problem Statement

Alice and Bob are two very bored siblings. They often play games on various data structures and graphs that are way too big. One day, Alice gave Bob a tree with N vertices, labeled from 1 to N , and marked a vertex on the tree as A . Then, Alice chose a vertex B on the tree, keeping it secret. Bob's goal is to find vertex B .

In one move, Bob chooses a vertex C on the tree, and Alice would tell Bob the LCA (lowest common ancestor) of A and B if the tree was rooted at C .

Alice wants to maximize the number of guesses that Bob needs, so she decides to cheat a little bit. As Bob is guessing, Alice can change her secret vertex B , as long as all of her previous answers are consistent with the new vertex she changes to.

Knowing Alice, Bob decided to employ a strategy that would minimize his guesses. Please help Bob compute the minimum number of guesses he needs to find B regardless of Alice's choices.

Input Format

```

N A
u1 v1
u2 v2
⋮
uN-1 vN-1

```

- N denotes the number of vertices.
- A denotes the index of vertex A.
- u_i, v_i is the endpoints of the i -th edge.

Output Format

```
ans
```

- ans is the maximal number of times Bob needs to find out vertex B.

Constraints

- $1 \leq N \leq 10^6$
- $1 \leq u_i, v_i, A \leq N$

- The given graph is a tree
- All inputs are integers

Example

Sample Input	Sample Output
5 1 1 2 2 3 3 4 4 5	1
5 3 1 2 2 3 3 4 4 5	2
7 1 1 2 1 3 2 4 2 5 3 6 3 7	3

Scoring

There are 2 subtasks in this problem. The score and additional constraints of each subtask are as follows:

Subtask	Score	Additional constraints
1	29	There exists a vertex v , where the input forms a binary tree when rooted at v
2	71	No other constraints