E - Farthest Vertex

Editorial (/contests/abc428/tasks/abc428_e/editorial)

/

Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 475 points

Problem Statement

There is a tree with N vertices numbered 1 to N. The i-th edge connects vertices A_i and B_i.

Define the distance between vertices u and v as the number of edges in the path with endpoints at vertices u and v. (This path is uniquely determined.)

Solve the following problem for $v = 1, 2, \ldots, N$.

- Among vertices $1, 2, \ldots, N$, output the number of the vertex that has the maximum distance from vertex v. If there are multiple vertices that satisfy the condition, output **the vertex with the largest number**.

Constraints

- $2 \leq N \leq 5 \times 10^5$
- $1 \leq A_i < B_i \leq N$
- The graph given in the input is a tree.
- All input values are integers.

Input

The input is given from Standard Input in the following format:

$$
\begin{array}{ll}
N & \\
A_1 & B_1 \\
A_2 & B_2 \\
\vdots & \\
A_{N-1} & B_{N-1}
\end{array}
$$

Output

Output N lines. The i-th line should contain the answer for $v = i$.

Sample Input 1 Copy

Copy

```
3
1 2
2 3
```

Sample Output 1 Copy

Copy

```
3
3
1
```

The vertex with the maximum distance from vertex 1 is vertex 3.

The vertices with the maximum distance from vertex 2 are vertices 1 and 3. Among them, vertex 3, which has the larger number, is the answer.

The vertex with the maximum distance from vertex 3 is vertex 1.

Sample Input 2 Copy

Copy

```
5
1 2
2 3
2 4
1 5
```

Sample Output 2 Copy

Copy

2026-01-02 (Fri)
05:31:54 +11:00

```
4
5
5
5
4
```

/#telegram)

turl=https%3A%2F%2Fatcoder.jp%2Fcontests%2Fabc428%2Ftasks%2Fabc428_e%3Flang%3Den&title=E%20-

2026-01-02 (Fri)
05:31:54 +11:00