

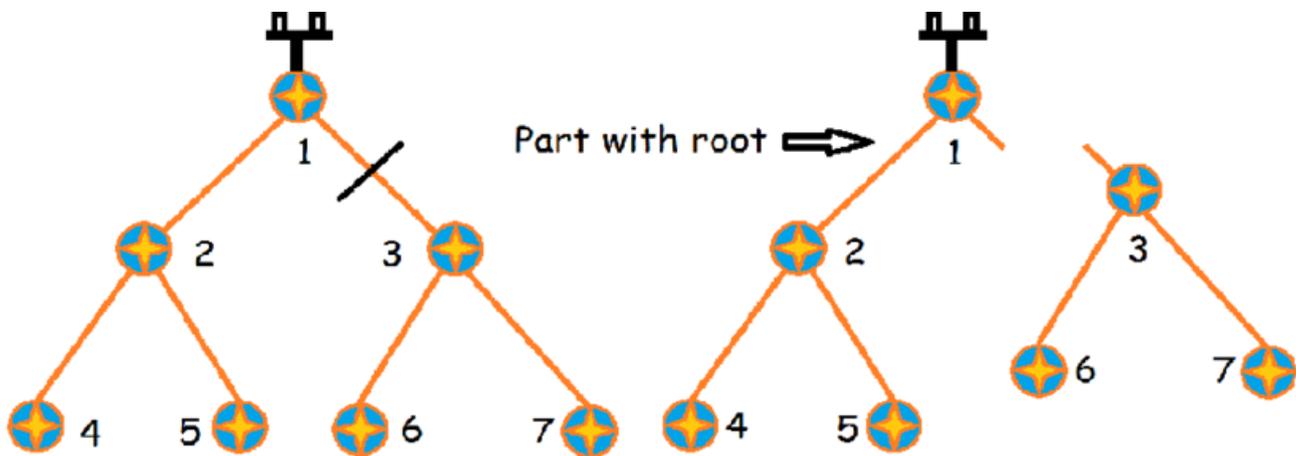
# Wire Removal

While decorating her house for *Diwali*, Anne noticed a *rice light* shaped like a *rooted tree*. We represent the lighting elements as the vertices of the tree and the wires that connect them as the edges. It was hanging from a firm support on the ceiling which we call the *root* of the rice light. The vertices are numbered  $1$  to  $n$  with  $1$  as the root.

The probability of any wire breaking is directly proportional to its distance from the support. The distance of a wire joining lighting elements  $u$  and  $v$  is considered as the maximum of the *distance* of  $u$  or  $v$  from the support (root).

If a wire breaks, the portion of the rice light that got disconnected from the support shatters on the floor, while the other portion remains intact and still hanging from the ceiling.

This image illustrates the case where the wire joining lighting elements  $1$  and  $3$  breaks. In this case, three elements ( $3, 6, 7$ ) shatters and four elements ( $1, 2, 4, 5$ ) remain connected to the ceiling.



Given that exactly one of the wires randomly breaks, find the *expected* number of vertices still connected to the ceiling.

## Input Format

The first line contains a single integer  $n$  denoting the number of vertices in the tree. The vertices are numbered  $1$  to  $n$ , with  $1$  as the root.

The next  $n - 1$  lines each contains two space-separated integers  $x$  and  $y$  denoting that there is an edge between vertex  $x$  and  $y$ .

## Constraints

- $2 \leq n \leq 10^5$
- $1 \leq x, y \leq n$
- It is guaranteed that the graph is a tree.

## Output Format

Print a single line containing a single real number denoting the answer. Your answer is considered correct if its absolute error doesn't exceed  $10^{-5}$ .

### Sample Input 0

```
3
1 2
1 3
```

### Sample Output 0

```
2.0000000000
```

### Explanation 0

Since there are only two edges and both are the same distance from the root, each edge breaks with the same probability. In both cases, the size of the remaining tree containing the root is **2**. Therefore, the expected size is **2**.

### Sample Input 1

```
7
1 2
1 3
2 4
2 5
3 6
3 7
```

### Sample Output 1

```
5.6000000000
```

### Explanation 1

This is a full binary tree. The figure in the problem statement illustrates it.