

## 8160 Embedding Enumeration

As you probably know, a *tree* is a graph consisting of  $n$  nodes and  $n-1$  undirected edges in which any two nodes are connected by exactly one path. In a *labeled tree* each node is labeled with a different integer between 1 and  $n$ . In general, it may be hard to visualize trees nicely, but some trees can be neatly embedded in rectangular grids.

Given a labeled tree  $G$  with  $n$  nodes, a *2 by  $n$  embedding* of  $G$  is a mapping of nodes of  $G$  to the cells of a rectangular grid consisting of 2 rows and  $n$  columns such that:

- Node 1 is mapped to the cell in the upper-left corner.
- Nodes connected with an edge are mapped to neighboring grid cells (up, down, left or right).
- No two nodes are mapped to the same cell.

Find the number of 2 by  $n$  embeddings of a given tree, *modulo*  $10^9 + 7$ .

### Input

The input file contains several test cases, each of them as described below.

The first line contains an integer  $n$  ( $1 \leq n \leq 300000$ ) — the number of nodes in  $G$ . The  $j$ -th of the following  $n-1$  lines contains two different integers  $a_j$  and  $b_j$  ( $1 \leq a_j, b_j \leq n$ ) — the endpoints of the  $j$ -th edge.

### Output

For each test case, output the number of 2 by  $n$  embeddings of the given tree,  $\text{mod } 10^9 + 7$ .

**Note:** All 4 embeddings of the tree in the example input are given in the figure below.

### Sample Input

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

### Sample Output

```
4
```

