F. Wildflower

time limit per test: 2 seconds
memory limit per test: 256 megabytes

Yousef has a rooted tree* consisting of exactly n vertices, which is rooted at vertex 1. You would like to give Yousef an array a of length n, where each a_i $(1 \le i \le n)$ **can either be 1 or 2.**

Let s_u denote the sum of a_v where vertex v is in the subtree† of vertex u. Yousef considers the tree *special* if all the values in s are **pairwise distinct** (i.e., all subtree sums are unique).

Your task is to help Yousef count the number of different arrays a that result in the tree being *special*. Two arrays b and c are different if there exists an index i such that $b_i \neq c_i$.

As the result can be very large, you should print it modulo $10^9 + 7$.

*A tree is a connected undirected graph with $n - 1$ edges.

†The subtree of a vertex v is the set of all vertices that pass through v on a simple path to the root. Note that vertex v is also included in the set.

Input

The first line contains an integer t $(1 \le t \le 10^4)$ — the number of test cases.

Each test case consists of several lines. The first line of the test case contains an integer n $(2 \le n \le 2 \cdot 10^5)$ — the number of vertices in the tree.

Then $n - 1$ lines follow, each of them contains two integers u and v $(1 \le u, v \le n, u \neq v)$ which describe a pair of vertices connected by an edge. It is guaranteed that the given graph is a tree and has no loops or multiple edges.

It is guaranteed that the sum of n over all test cases doesn't exceed $2 \cdot 10^5$.

Output

For each test case, print one integer x — the number of different arrays a that result in the tree being *special*, modulo $10^9 + 7$.

Example

input

```
7
2
1 2
8
1 2
2 3
3 8
2 4
4 5
5 6
6 7
10
1 2
2 3
3 4
4 5
5 6
4 7
7 8
4 9
9 10
7
1 4
4 2
```

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

output Copy

```
4
24
0
16
48
0
4
```

Note

The tree given in the fifth test case: