



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 ($1 \leq i \leq n$) **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 ($1 \leq t \leq 10^4$) — the number of test cases.

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

Then $n - 1$ lines follow, each of them contains two integers u and v ($1 \leq u, v \leq n, u \neq v$) 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

Copy

```
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
```

Codeforces Round 1029 (Div. 3)

Finished

Practice



→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++23 14.2 (64 bit, ms)

Choose file: Choose File No file chosen

Submit

→ Last submissions

Submission	Time	Verdict
323842993	Jun/11/2025 06:39	Accepted
323494490	Jun/08/2025 18:57	Memory limit exceeded on test 3
323451994	Jun/08/2025 18:08	Wrong answer on test 1

→ Problem tags

combinatorics dfs and similar trees

No tag edit access

→ Contest materials

- Announcement (en) ✕
- Tutorial (en) ✕

```
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
```

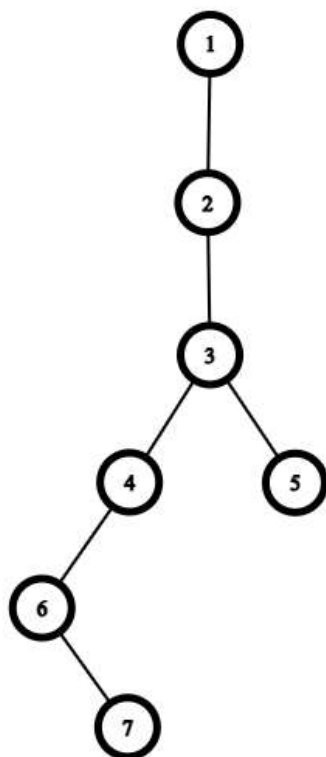
output

Copy

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

Note

The tree given in the fifth test case:





ITMO