Count on a tree MXXI

Description

Count on a tree is a series of problems on SPOJ online judge. All of them are some counting problem on the tree structure. It's a very nice problemset to let you know your skill on this kind of problem. COT may be such easy that you can solve it within several minutes, COT II may be more difficult than COT, COT III may be much more difficult, and so on.

When you solve all of the COT problems on SPOJ, you can confidently say that you are a master of counting on a tree. To show you the attraction of counting on a tree, let me introduce following problem:

Given a tree with N vertices, you should calculate the probability of a subset of vertices is disconnected when uniformly randomly choosing from all non-empty subset of vertices. A subset of vertices is disconnected if and only if exists two vertices u, v in this subset such that there's a vertex not in the subset which is on the simple shortest path from u to v.

To check that your calculation is exactly correct, you should output $P \times Q^{-1} \mod 10^9 + 7$ when the probability is $\frac{P}{Q}$.

A tree is a kind of graph with N vertices and $N - 1$ edges such that for each pair of vertex, there's a unique simple path between them.

Input

The first line contains an integer T indicating the total number of test cases. For each test case, the first line contains an integer N indicating the number of vertices. Following $N - 1$ lines each contains two space separated integer u_i, v_i indicating that there's an edge between vertex numbered u_i and vertex numbered v_i.

- $1 \leq N \leq 10^5$
- $1 \leq \sum N \leq 10^6$
- $1 \leq u_i, v_i \leq N$

Output

For each test case, output $P \times Q^{-1} \mod 10^9 + 7$ in one line when the probability is $\frac{P}{Q}$.

Sample Input

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

Sample Output

```
0
142857144
866666673
```

Hint

For first test case, $P = 0, Q = 3$. For second test case, $P = 1, Q = 7$. For third test case, $P = 4, Q = 15$.