Balanced organigrams

The mafia has a very strict organigram. Each of its members has one boss (except the *capo di tutti i capi*, which has no bosses) and zero, one, or two subordinates. The *capo di tutti i capi* wants to give weapons to the band, but it must satisfy the following restriction. For each member with two subordinates, the amount or armed members which are in the subtree of the first subordinate (including it) must be equal to the amount of armed members in the subtree of the second subordinate, otherwise there would be an unbalance in power. Knowing the organigram of the organization, you must determine the maximum amount of members that can be armed.

In the Figure 1 you can see an example of organigram. The members of the organization are numbered starting from 0 and are colored if they are armed.
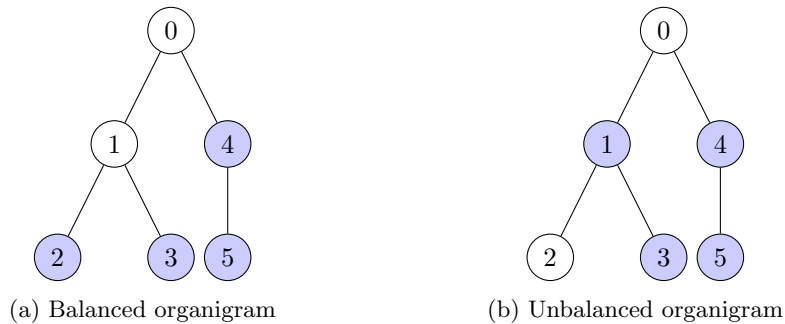

(a) Balanced organigram   (b) Unbalanced organigram

Figura 1: Organigram examples (colored nodes are armed)

Input and output

The first line contains an integer T, the number of cases.

For each case, the input contains an integer n, the number of memebers of the organization. Follow $n-1$ lines with two integers $0 \le u_i, v_i < n$ indicating that member v_i is subordinate of member u_i. The node 0 is always the *capo di tutti i capi*.

For each case, you must write one line with the maximum number of armed members satisfying the restriction.

Sample

Input:

```
1
6
0 1
0 4
1 2
1 3
4 5
```

Output:

5

Explaination: the organigram is as in the figure. The distribution of arms is as in case (a), but the *capo di tutti i capi* is also armed.

Constraints

$1 \leq T \leq 10^5$.

$1 \leq n \leq 10^5$. The sum of n for the T cases is at most $2 \cdot 10^5$.

$0 \leq u_i, v_i < n$. The organigram is guaranteed to satisfy the restrictions in the statement.

Subtasks

1. (29 points) $n \leq 15$ and $T \leq 100$.
2. (32 points) Each member has zero or two subordinates.
3. (39 points) No additional constraints.