Yapanese Highways 2

Time Limit: 2 seconds

Problem Description

There are n towns $t_1, \ldots, t_n$ in Yapan Kingdom. Sori Yabe, the Premier of Yapan Kingdom, had renewed exactly $n-1$ highways with minimum cost to enable his people to travel between any pair of towns without using old highways. Unfortunately, an earthquake striked Yapan after the renewal of the highways. Now, the old highways are totally broken, so Yapanese people have to use the renewed highways. In order to raise fund to rebuild Yapan, Sori Yabe decides to collect tolls. The Yapanese government will collect 1 Yapanese Yan when a person pass through any new highway. Please write a program to determine the highest toll of traveling between any pairs of towns in Yapan.

Technical Specifications

1. The number of test cases is no more than 20.
2. Basic: $2 \leq n \leq 100$.
3. Hard: $2 \leq n \leq 10000$.
4. Please note that the renewed highways form a spanning tree.

Input Format

The first line of the input file contains an integer indicating the number of test cases. The first line of each test case contains a integer n. Each of the following $n-1$ lines contains two integers i, j indicating that there is a highway between t_i and t_j. You may assume there exists a path between any pair of towns. Note: the integers in the same line are separated by blanks.

Output Format

For each test case, output the highest toll.

Sample Input

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

Sample Output

```
1
2
```