Con-Junctions

The city of **Y-O** is a network of two-way streets and junctions with the following properties:

1. There is no more than one street between each pair of junctions.
2. Every junction is connected to every other junction either directly via a street or through other junctions by a unique path.
3. When a light is placed at a junction, all the streets meeting at this junction are also lit.

A valid lighting is a set of junctions such that if lights were placed at these, all the streets would be lit. An optimal lighting is a valid lighting such that it contains the least number of junctions.

The task is divided into two subtasks:

1. Find the number of lights in an optimal lighting.
2. Find the total number of such optimal lightings in the city.

Input

- The first line of the input contains a positive integer **t <= 20**, denoting the number of test cases.
- The description of the test cases follows one after the other.
- **Network Description:**
  - The first line of description of a network consists of a positive integer **n <= 100010** denoting the number of junctions in the network.
  - Each junction is numbered with a unique integer between **1** and **n**.
  - The following **n-1** lines contain a pair of integers **u v (1 <= u,v <= n)** separated by a single space denoting that there is a street between junction **u** and junction **v**.

Output

The output must consist of **t** lines, the **k^{th}** line corresponding to the **k^{th}** network; **(1 <= k <= t)**. The **k^{th}** line must contain two integers separated by a single space. The first integer on the **k^{th}** line must be the number of junctions in an optimal lighting of network **k**. The second integer must be **N%10007**, which is the remainder left by the number of optimal lightings when divided by **10007**.

Example

Input:
2
4
1 2
2 3
3 4
3
1 2
1 3

Output:
2 3
1 1