Problem D: Dazzling Mountain

Time limit: 10s, Memory limit: 1GB.

The highest peak of Bytelandshire is Mount Stackframe - a picturesque mountain famous for its beautiful views. On Mount Stackframe there are n shelters for tourists (numbered from 1 to n), and $n-1$ trails, each connecting two shelters. Shelter number 1 is located at the very top of the mountain and it is known that from any other shelter you can get to 1 in exactly one way (as long as you do not turn back on the way). The shelters with exactly one trail adjacent to them are located at the foot of the mountain (except for shelter 1 which, needless to say, is not a ground shelter even if there is only one trail adjacent to it). The traditional Mount Stackframe hike begins at some ground shelter and ends at the top.

If a tourist stops at a certain shelter x and looks down, they see a number of shelters – these are exactly the ones from which the path to 1 passes through x. A new idea of the National Park's leadership is to build a viewpoint wherever the number of shelters visible from x (including x) is exactly d.

Find all values of d for which every tourist hiking from the bottom to the top of the mountain will visit at least one viewpoint, regardless of which ground shelter they have started from.

Input

The first line of input contains the number of test cases z ($1 \leqslant z \leqslant 10\,000$). The descriptions of the test cases follow.

The first line of the test case contains one integer n ($2 \leqslant n \leqslant 1\,000\,000$) – the number of shelters. Each of the following $n-1$ lines consists of two integers a_i and b_i ($1 \leqslant a_i, b_i \leqslant n$) denoting that the i-th trail connects shelters a_i and b_i. The trails do not intersect outside the shelters.

The total number of shelters in all test cases does not exceed $3 \cdot 10^6$.

Output

For each test case, output two lines: the first should contain the number of different values d, for which each visitor always passes a viewpoint. The second line should contain these values in ascending order.

Example

For an example input:	The correct output is:
1 9 1 2 2 3 3 4 3 5 2 6 6 7 7 8 7 9	4 1 3 8 9