



Problem D

Islands

As a member of The Academy of Chtholly, you want to rush to the battle field to help Chtholly. There are n islands in the sky, and you are in the first island.

At first, there are $n-1$ transportation lines between islands, each of which connects two islands. These lines insure that each two islands in the sky are reachable.

However, due to the continuous attack from the beasts on the ground, each transportation line has a 50% chance to be destroyed.

You want to know when we consider all the 2^{n-1} possible realities (a transportation line can be destroyed or not and it creates two branching realities), how many realities of them allowing you to reach exactly k islands (including the first island).

The answer may be large, so you just need to output the answer mod 1811939329.

Input

The input contains several test cases and the first line contains an integer T ($1 \leq T \leq 18$) indicating the number of test cases.

In each test case, the first line contains an integer n ($1 \leq n \leq 100000$) which is the number of islands in the sky. Each of the following $n-1$ lines contains two integers x and y ($1 \leq x, y \leq n$) describing an edge between the x -th island and the y -th island.

About half test cases of the input satisfy $1 \leq n \leq 5000$.

Output

For each test case, output a line containing n numbers.

The k -th number of the line is the number of possible realities where you can reach exactly k islands.

Sample Input

Sample Output

1	8 4 2 1 1
5	
1 2	
2 3	
3 4	
4 5	