

Problem K. Triples

Input file: *standard input*
Output file: *standard output*
Time limit: 7 seconds
Memory limit: 512 mebibytes

You are given a tree, i.e. a connected undirected graph with no cycles. For every two vertices x, y let $d(x, y)$ denote the length (i.e. the number of edges) of the unique simple path between x and y . Count all the (unordered) triples $\{x, y, z\}$ such that $d(x, y) = d(y, z) = d(z, x) > 0$.



Input

The first line of input contains the number of test cases z ($1 \leq z \leq 20$). The descriptions of the test cases follow.

The first line of every test case contains the number of vertices n ($3 \leq n \leq 100\,000$). Each of the next $n - 1$ lines contains two integers a, b ($1 \leq a, b \leq n$), denoting that there is an edge between vertices a and b .

Output

For each test case output one integer: the number of triples in question.

Example

standard input	standard output
2	1
4	4
1 2	
1 3	
1 4	
8	
1 2	
1 3	
1 4	
2 5	
2 6	
3 7	
4 8	