Triple

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

There is a tree with n vertices. Vertices are numbered from 1 to n. The length of each edge is 1. Let S be the set $\{(A, B, C) : dis(A, B) \le \max\{dis(A, C), dis(B, C)\}, 1 \le A, B, C \le n, A \ne B, A \ne C, B \ne C\}$, where $dis(A, B)$ means the length of the shortest path from vertex A to vertex B. So what's the size of S?

Input

The input contains multiple test cases. For each test case:

The first line contains an integer n ($3 \le n \le 100000$) – the number of vertices.

Each of the next $n - 1$ lines contains two integers u_i and v_i ($1 \le u_i, v_i \le n, u_i \ne v_i$), which means there is an edge between vertex u_i and v_i.

The sum of values of n in all test cases doesn't exceed 100000.

Output

For each test case, output an integer denoting the size of S.

Examples

standard input	standard output
3 1 2 2 3 4 1 2 2 3 2 4	4 18