

D. Distance in Tree

time limit per test: 3 seconds
memory limit per test: 512 megabytes

A tree is a connected graph that doesn't contain any cycles.

The *distance* between two vertices of a tree is the length (in edges) of the shortest path between these vertices.

You are given a tree with n vertices and a positive number k . Find the number of distinct pairs of the vertices which have a distance of exactly k between them. Note that pairs (v, u) and (u, v) are considered to be the same pair.

Input

The first line contains two integers n and k ($1 \leq n \leq 50000$, $1 \leq k \leq 500$) — the number of vertices and the required distance between the vertices.

Next $n - 1$ lines describe the edges as " $a_i b_i$ " (without the quotes) ($1 \leq a_i, b_i \leq n$, $a_i \neq b_i$), where a_i and b_i are the vertices connected by the i -th edge. All given edges are different.

Output

Print a single integer — the number of distinct pairs of the tree's vertices which have a distance of exactly k between them.

Please do not use the `%lld` specifier to read or write 64-bit integers in C++. It is preferred to use the `cin`, `cout` streams or the `%I64d` specifier.

Examples

input	Copy
5 2 1 2 2 3 3 4 2 5	
output	Copy
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input	Copy
5 3 1 2 2 3 3 4 4 5	
output	Copy
2	

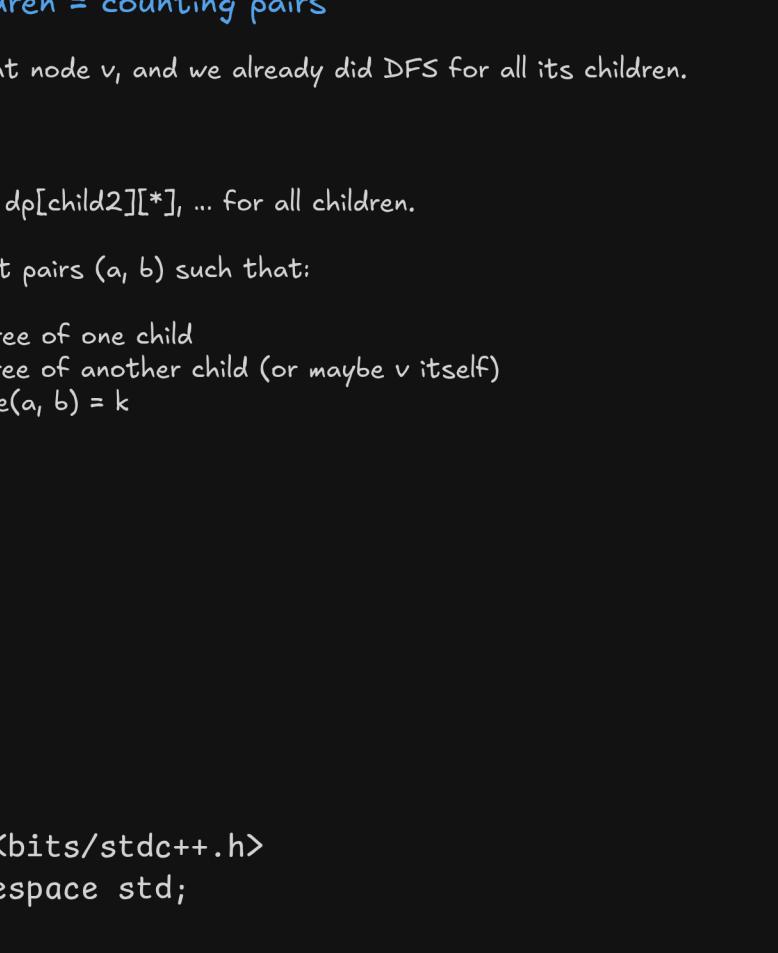
Note

In the first sample the pairs of vertexes at distance 2 from each other are $(1, 3)$, $(1, 5)$, $(3, 5)$ and $(2, 4)$.

You are given:

- A tree with n nodes.
- You need to count how many pairs of nodes (u, v) have distance exactly $= k$.

Distance means number of edges on the shortest path between them.



DP idea

We can use DP on trees to count pairs efficiently.

$dp[v][d] = \text{number of nodes in subtree of } v \text{ that are at distance } d \text{ from } v$

$dp[v][0] = 1$ (the node itself)

$dp[v][1] = \text{number of children of } v$

$dp[v][2] = \text{nodes 2 edges away within } v\text{'s subtree, and so on.}$

Algorithm outline

1. Choose any node as root (say, 1).
2. Use DFS to visit nodes.
3. For each node:
 - Recursively calculate $dp[\text{child}][]$.
 - Combine child's dp into parent's dp while counting valid pairs.

4. Return total pairs.

What are we counting again?

We want to count pairs of nodes (u, v) such that:

the distance(u, v) = k

Now, since this is a tree, there is exactly one simple path between any two nodes.

That's important — no duplicates from multiple paths.

Combining children = counting pairs

Suppose we are at node v , and we already did DFS for all its children.

We now have:

$dp[\text{child}][*], dp[\text{child}2][*], \dots$ for all children.

We want to count pairs (a, b) such that:

- a is in subtree of one child
- b is in subtree of another child (or maybe v itself)
- and $\text{distance}(a, b) = k$

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