

Problem F. Busy Night

Due to the town's long existence, it has a very simple communication system. This system is made up of a number of main nodes that are connected to each other. If person A wants to contact person B, he would connect to the closest node and the call will be directed to the node closest to person B.

This system has two main properties:

1. Since the system is very simple, there is only one path between each pair of nodes, and normally the length of this path is equal to the time it takes for the message to reach from person A to person B. But when the network is busy, this time will be raised to the power of k .
2. In every moment, only 2 nodes are connected to each other, which is to say, the system can only handle one call at any given time.

Tonight is a strangely busy night: There has been some news going around the town and many people are contacting their friends to tell them about it. The communication experts are concerned about the load on the network and want to estimate how long would it take for all the messages to be sent. If there were to be exactly one call between each node, how long would it take for all the calls to be done?

The answer may be too large, so output the answer modulo $10^9 + 7$

Input

The first line includes two integers n ($2 \leq n \leq 3 \times 10^5$) and k ($1 \leq k \leq 200$) separated by space.

Each of the next $n - 1$ lines contains two integers x and y ($1 \leq x, y \leq n$), which represents a connection between 2 nodes.

Output

Output an integer indicates the time for all the calls to be done.



Examples

test	answer
10 200 1 2 1 3 2 4 3 5 4 6 1 7 3 8 6 9 8 10	537265878
5 1 5 2 1 5 1 3 4 2	20