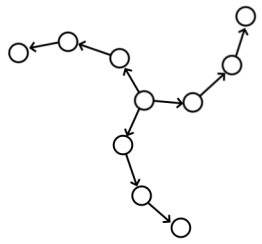
TENDRILS

Can you see it? The city, its streets, its walls—woven with tendrils of something dark. It's been here all along, slipping through the cracks, binding itself to everything we know. And now it's too deep, too close, for us to even recognize. Hidden in plain sight, it waits.

Let the tendrils be modeled by a directed tree rooted at a node r. Given an integer k, the tree consists of k paths emanating from the root r, where each path has a length of k.



Example: a tree of tendrils where $k = 3$

Given a directed graph G and an integer k, the **TENDRILS** problem asks whether or not there exists a subgraph that is a tree of tendrils of depth k. Prove that **TENDRILS** is NP-Complete. Do not base your reduction on the Hamiltonian Path problem.