12) The *diameter* of a tree is the maximum distance between any two vertices. Given a connected, undirected graph, write an algorithm for finding a spanning tree of minimum diameter. Prove the correctness of your algorithm.

for n vertex connected graph.
do dfs to every vertex and we can get the tree diameter of every spanning tree with different root. Compare with every tree diameter and pick the spanning tree with the least tree diameter. The complexity of this brute-force way is $O(n^2)$