

Network Algorithms: Exercise 14

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Different studies of the structures of social networks have reported that the degree distribution of the underlying connectivity graphs asymptotically follow a power law, i.e., the probability of a node in a social network to have degree k is given by $Pr[k] = ck^{-\alpha}$, where α and c are some constants.

1. Is the diameter of two graphs with the same node-degree distribution equal (not necessarily power law graphs)?
2. Consider the following game: Two players choose a node on the graph, where they start their rumor. The player that is closer to a node in the graph can spread its rumor to the node. Winner is the player who can spread his rumor to more nodes. In a power law network, is it the optimal strategy to always choose the node with the highest degree?