

Computational Assignment 2

Complex Networks 1

1. Write a code that computes the global clustering coefficient and the degree assortativity of a given network. Using this code, compute these quantifiers for the networks lesmis.dat and polbooks.dat
2. Implement the breadth-first search using naive as well as the efficient algorithm. Use these implementations to calculate the distances between all vertex pairs in the network lesmis.dat. Report the actual computation times for the two implementations on your machine.
3. Extend the breadth first search so that it finds at least one shortest path between given two vertices. For the network polbooks.dat, compute a shortest path between every vertex pair.
4. Implement the two source BFS (Optional)
5. Write a code to calculate the betweenness centrality of vertices in an undirected network. Using this code, compute the centrality values of vertices in lesmis.dat (Optional)
6. Implement Dijkstra's algorithm to calculate the shortest distances in a weighted undirected network. Read the network from adjnoun.dat and compute the shortest distances from vertex 0 using this implementation. The network is given in the form of an edge list, and the third column lists edge weights. (Optional)