Advanced Algorithms Homework

Advanced Algorithms Spring 2023
Due //2023 at midnight ET

Name:

Time Spent:

Problem 1

a) Implement degree and closeness centrality. The initial code repository is linked here. Please fork the repo to your own repository. Be sure to check your implementations using the provided test file. The methods have been created for you, with parts to fill in marked with TODO. Provide a link to your GitHub repo.

Problem 2

a) Choose a dataset from https://networkrepository.com/network-data.php and pose a question that can be answered using a centrality measure. (Note: the smaller graphs in the social networks category are good options, the larger graphs have a long runtime.) Please provide a link to the dataset below and state your question.

b) Look through this page on the NetworkX website and pick a measure of centrality that we did not talk about in class. Research this centrality measure and explain the implementation of this centrality measure using words and equations when applicable. Please include your sources.

c) Would this centrality measure be a good choice to answer your question. If so, why and how? If not, why? Which centrality measure would better help you answer your question?

d) Use the NetworkX implementation of the centrality measure on the dataset that you discussed in part C above. There are a few lines of commented-out code that show how to do this in the homework.py code file. Include a screenshot of the graph and a few sentences explaining your findings, but no need to include your code.

e) Choose 2 other centrality measures (it could be the ones talked about in class) and state what they might help you measure in context of your dataset.