Social Network Analysis Homework

Scenario

You are working in the marketing department or at Marketing Agency, and your goal is to detect the most important guys to target them. Considering the budget is limited, you should help the marketing specialist to decide whom to target.

Tasks

You have a data called *connections.txt,* it is list of edges.

1. Create a Directed graph
2. Show which nodes are bridges.
3. Show the density of the graph. Comment about your findings
4. Show which nodes have the highest and lowest number of connections.
5. Show which nodes have the highest incoming and outgoing connections
6. Show which nodes have the highest closeness, betweenness, and eigenvector | Interpret your findings
7. Implement a community detection algorithm on the directed graph and show how many communities were created.
8. Show the largest and the smallest community. | Interpret your findings
9. Select the largest three communities and draw them. After doing so, remove the top 3 nodes with the highest Degree Centrality, Closeness Centrality, Betweenness Centrality, and Eigenvector. Each should be in a separate plot/draw.
10. Draw the influencers of those top 3 communities.
11. Design an action plan:
    a. Use hypothetical business (telecom, marketing agency, etc.)
    b. b. Use a hypothetical marketing budget
    c. c. Use a hypothetical cost per action (advertisement cost)
    d. d. Decide whom should you target?

Submission Rules

1. The code must be well documented.
2. We will not continue checking after the error message (except the package-related ones).
3. Provide only GitHub link
4. You can use either *.py* or *.ipynb*
5. Late submissions will be treated according to the rules written in the syllabus.
6. Submission deadline **December 16.**