DMST 2019
Network Science

COURSEWORK: ANALYSIS OF A NETWORK

- Analysis to be performed through use of the Gephi Software Tool (https://gephi.org) or Python with relevant Network Analysis packages.

- Choose a network you wish to analyze, explain why you chose to analyze this specific network and describe what you want to achieve through this analysis. You are free to choose your own dataset. Feel free to experiment with various datasets before you make your choice. The dataset may be obtained through one of the following means:

    1. 3rd Party applications (Tools – APIs)
    2. Datasets on the web
    3. Create your own .csv data set.

- Provide a succinct analysis of the basic properties of the network. This can include, but is not necessarily limited to:
    - Graphical representation of the network
    - Basic topological properties, such as numbers of nodes and edges, network diameter, and average path length.
    - Component measures, such as number of connected components, existence of a giant component and component size distribution.
    - Degree measures, such as maximum and average node degrees, as well as degree distribution.
    - Centrality measures (degree, betweenness, closeness, eigenvector)
    - Clustering effects in the network: average clustering coefficient, number of triangles, clustering coefficient distribution, existence of the triadic closure phenomenon in the friendship neighborhood.
    - Bridges and local bridges.
    - Gender and homophily.

You may also want to experiment with other measures, not covered in the lectures in depth, such as Graph density; Community structure (modularity); the PageRank algorithm; etc.

Hint: It might be a good idea to produce ranked or partitioned versions of the network graph based on the criteria by which you analyze it (use the Partition and Ranking tabs in the top left window in Gephi).

Good Luck!!!