**CE 88/CP 88**

Assignment 1 part 1 (10 pts)

*Spring 2023*

Due date: January 31st, 2023, 11:59 PM with 48hr grace period

***Network Metrics***

1. Go to the data repository provided by the NetSci book by Barabasi, here: <http://networksciencebook.com/translations/en/resources/data.html>

and select 1 dataset to create their graphs based on their lists of edges and nodes. Describe what the nodes and the links represent (0.5 pt)

Should it be read as directed or undirected graph? (0.5 pt)

1. Plot the histogram of degrees of the network (0.5 pt)
2. What is the average clustering coefficient in the network? (0.5 pt)
3. What is the average shortest path in the network? (1pt)
4. What is the largest clustering coefficient in the network? (1pt)
5. List the nodes with the largest clustering coefficient (2 pts)
6. What is the value of the longest shortest path in the network? (2 pts)
7. Write the nodes in longest shortest paths of the network? (2 pts)

*Submission instructions:*

* Please make sure to submit both a summary of your answers to all questions in a **PDF** and a separate **IPYNB** (Jupyter notebook) file containing your code on bCourses.
* Name your file using these format: *LASTNAME\_FIRSTNAME\_HW1\_part1.pdf* and *LASTNAME\_FIRSTNAME\_HW1\_part1.ipynb*
* Don’t forget to write your name on the top of your PDF file submission.

*Note:* See all the python scripts provided in Lectures 1 to 2 for guidance in doing this homework.