Capital University of Science and Technology

Department of Computer Science

CS3283 – Graph Algorithms – S4

ASSIGNMENT NO. 03

Semester: Fall 2022 **Max Marks:** 10

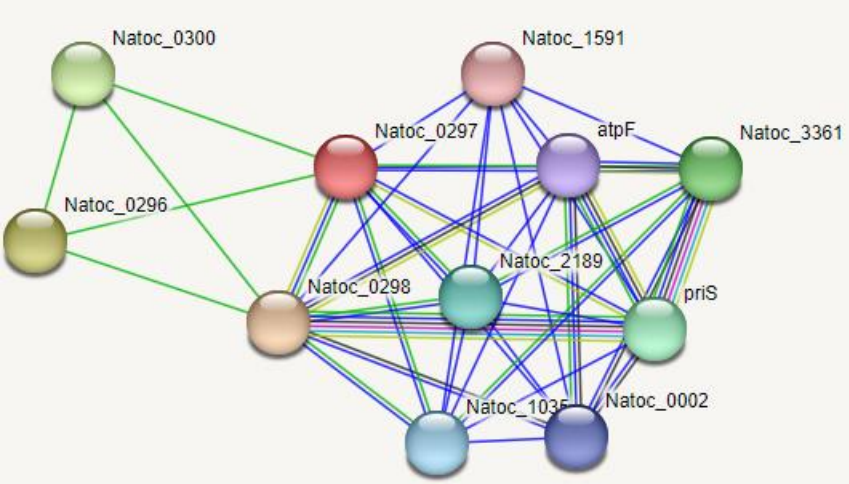
Instructors: Omaid Ghayyur
Assigned Date: December 12, 2022 **Due Date:** December 23, 2022
Name: **Reg. No.**

Note:

- Do the assignment by yourself, effort will be rewarded, **cheating case will result in 0**.
- No assignment will be checked and accepted after **due date**.
- **Read** & **Understand** the assignment submission process, no assignment will be entertained if not submitted in proper format as per instructions.

Question 1:

Consider the following biological network of NATOC protein with its interactions with other proteins as shown in the figure below. ***(Excel file of dataset containing edges is provided)***



Perform the following tasks:

1. Read the dataset file in Python
2. Identify the unique proteins and display them which represents the nodes
3. Calculate the degrees of all the nodes
4. Save the edges in a list after reading from excel file.
5. Identify the important proteins using:

a. Degree Centrality
b. Betweenness Centrality
c. Closeness Centrality

6. Show the results of all centrality measures along with values.

Coding Standard to Follow:

- For each graph create different Python Script (.py) will all the functionalities to implement
- There should be proper menu for user to perform the task
- Use proper comments in code for understanding
- Print output of each task with proper messages

Assignment Submission Instruction:

- Do the assignment by yourself (effort will be rewarded)
- Create a word document report with code snippets and output for each graph
- Submit softcopy **WORD document** and **PDF** with your registration number only.
- **In WORD Document include the PYTHON Code with output screenshots**
- Submit the softcopy in Microsoft Teams assignment section.
- Submit each python script and word document separately (do not upload folder or zip file)

Marks will be deducted if coding standards and submission instructions are not followed properly.

Assignment document submitted on Microsoft Assignment will be marked other submissions will be marked as 0.