Capital University of Science and Technology

Department of Computer Science

CS3283 – Graph Algorithms – S4

ASSIGNMENT NO. 01

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

Instructors: Omaid Ghayyur
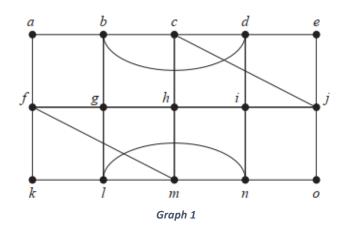**Assigned Date:** November 02, 2022   **Due Date:** November 09, 2022
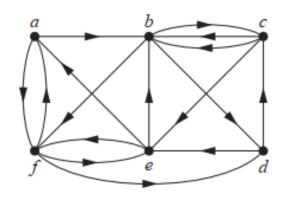**Name:**   **Reg. No.**

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:

For the given directed and undirected graphs:

Graph 1

Graph 2

Write the PYTHON program for each graph in which:

1. Display Nodes List of the Graph
2. Display Edge List of the Graph
3. Count Connected Components of the Graph
4. Print Connected Components of the Graph
5. Display Incidence Matrix of a Graph
6. Display the Nodes degrees
7. Count Number of Edges

8. Visualize the graphs

9. Check if:

    a. Euler circuit exist or not and Graph is Eulerian

    b. Euler path exists or not

    c. Hamilton Path

    d. Perform Depth First and Breadth First Traversal on graph

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.