Graph Mining CSF426
Lab 1 (Non-evalauative)
Time: 2 pm - 4 pm
Date: August 19, 2023

Instructions: All questions need to be answered. You are required to submit programs in jupyter notebook on canvas only. For theoretical questions, you can type answers in the jupyter notebook itself. There is no need to create a separate text file. You are free to choose any library package in python for the implementation of the programs.
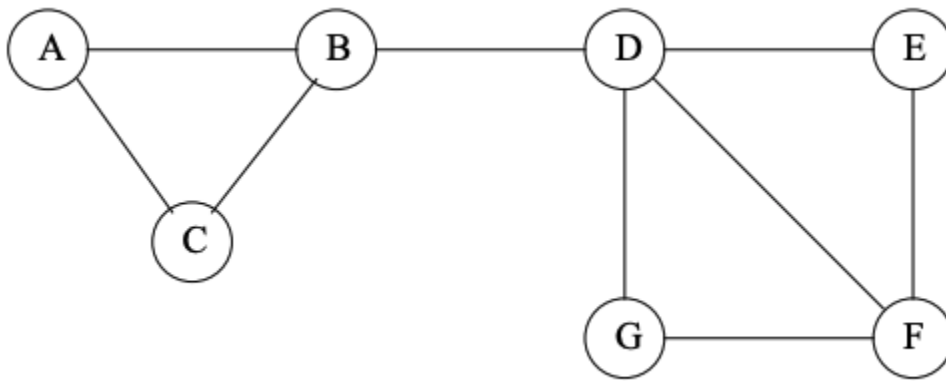
PART-1

a) Create the graph G (shown in figure) using networkx package in python and display.

b) Compute adjacency and degree matrix for G.

c) List the nodes in descending order of their degrees.

d) Compute the laplacian matrix $L(G)$ of G using formula: $L = D - A$ and

computes the eigenvalues and corresponding eigenvectors. Print the node(s) along with corresponding eigenvector(s) having highest eigenvalue(s).

PART-2

e) It is possible to think of the edges of the graph G as the nodes of another graph G'. If yes, construct G' from G and also specify the criterias of creating nodes and edges in G'.

f) Is it possible to convert the given graph G into a k-partite graph. If yes, what is the value of k and how the graph will look like. If not, why? **[3 marks]**