

Algorithms and Applications in Social Networks

HW #3

Instructions: Implementation should be done using Python and NetworkX library. Please submit your code in .py files (file per question) or .ipynb file (Jupyter Notebooks).

The theoretical part of the question should be submitted in PDF file.

Do not forget to write IDs of all member in the team (pair). Submit only once per team!

Please ZIP all files together, name the file HW3_<student_id>.zip and upload it to Moodle.

Question #1:

- Using Map/Reduce approach, find all the triangles in a given graph.

Example input:

A -> B C F

B -> A

C -> A D

D -> C E F

E -> D F

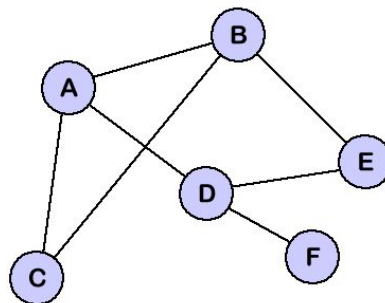
F -> A D E

Example output:

(D, E, F)

Question #2:

- Given an undirected graph of 6 nodes. Using the Link Prediction algorithm with Preferential Attachment heuristics, find the (non-existing) edge that has the highest chance to be created in this network.



Question #3:

- There are 20 people, all of them connected to each other. 18 connections are removed. Prove that the the graph is still connected.