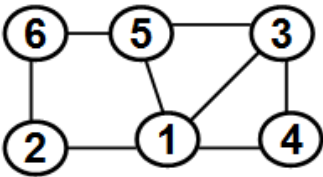


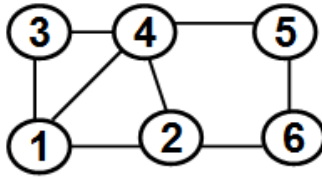
CSC 641 Network Science
Fall 2017
Instructor: Dr. Natarajan Meghanathan
Exam 3 (Take Home)

Due: Nov. 16, 2017 (11.59 PM, through Canvas). Scan your answers to a single PDF file and submit through Canvas. If you have any problem in uploading the file through Canvas, email me.

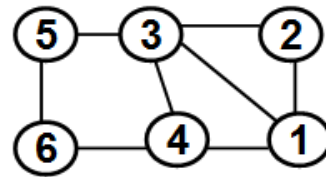
1) (35 pts) Run the BFS algorithm to determine the **betweenness of the edges** in the graphs assigned to you. Show in detail all the work [Note: You should NOT use the software to compute the edge betweenness]



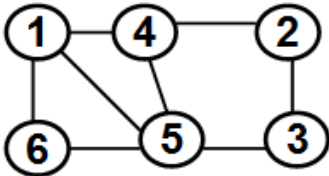
Alton Franklin



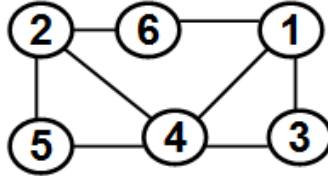
Chirone Gamble



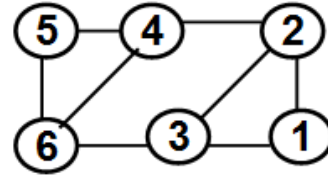
Robin Ghosh



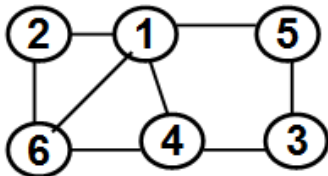
Eric Jackson



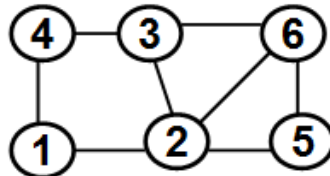
Jonathan Townes



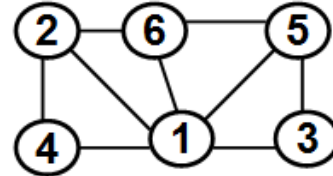
Shengtan Wu



Roman Zubatiuk



Jamoris Miller

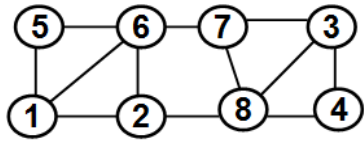


Cheronika Manyfield-Donald

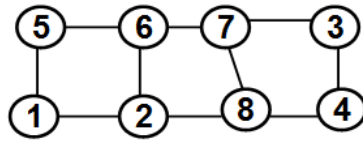
2) (35 pts) Run the Girvan Newman community detection algorithm based on (a) Edge betweenness and (b) Neighborhood Overlap: NOVER scores to determine a partitioning of the graph into communities.

For each of (a) and (b):

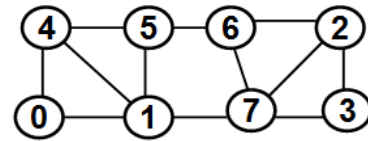
Determine the modularity score for each of the communities and the total modularity score. Also, draw the partitioning hierarchy and indicate the modularity score of the partitions/communities.



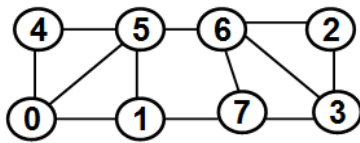
Alton Franklin



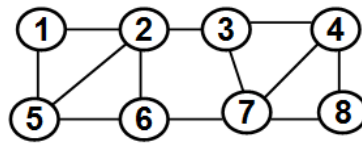
Chirone Gamble



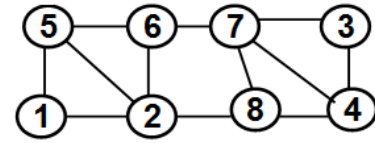
Robin Ghosh



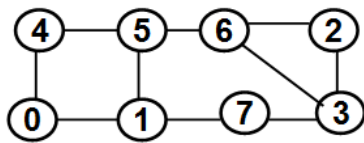
Eric Jackson



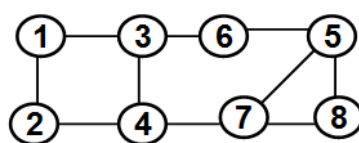
Jonathan Townes



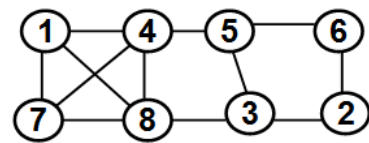
Shengtan Wu



Roman Zubatiuk

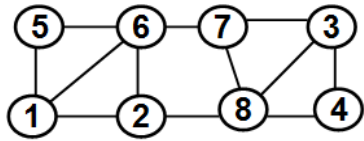


Jamoris Miller

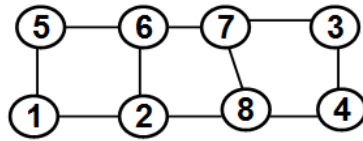


Cheronika Manyfield-Donald

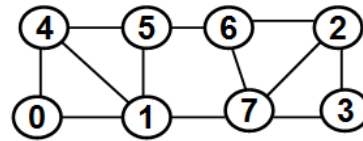
- 3) (30 pts) (a) Determine the threshold NOVER score (minimum NOVER score) that would guarantee the satisfaction of the **strong triadic closure** property for the edges in the following graph.
- (b) Using the threshold NOVER score determined, identify the strong and weak ties.
- (c) Determine a partitioning of the graph into communities based on the strong/weak ties identified.
- (d) Determine the modularity score for each of the communities and the total modularity score. Also, draw the partitioning hierarchy and indicate the modularity score of the partitions/communities.



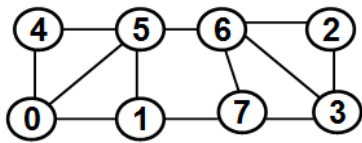
Alton Franklin



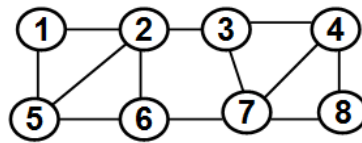
Chirone Gamble



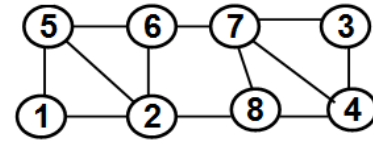
Robin Ghosh



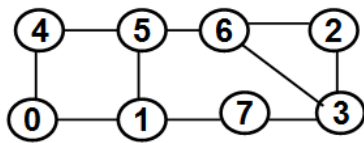
Eric Jackson



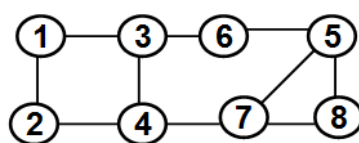
Jonathan Townes



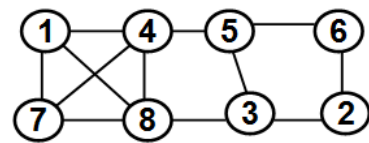
Shengtan Wu



Roman Zubatiuk



Jamoris Miller



Cheronika Manyfield-Donald