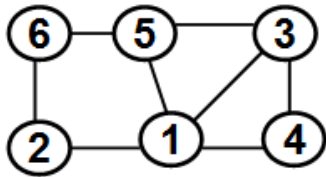


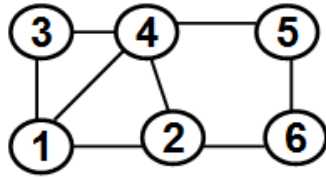
CSC 641 Network Science
Fall 2016
Instructor: Dr. Natarajan Meghanathan
Exam 3 (Take Home)

Due: November 17, 2016 (6 PM, in class). Submit a printed hardcopy in class (with this quiz sheet as a cover page and your name and J# on the top of the sheet).

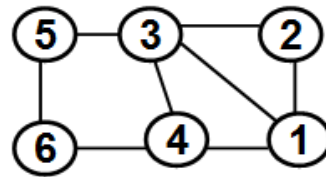
1) (35 pts) Run the BFS algorithm to determine the betweenness of the edges in the graphs assigned to you. Show in detail all the work [Note: You should NOT use the software to compute the edge betweenness]



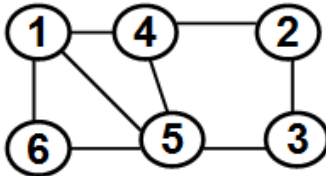
Li-Jing Chang



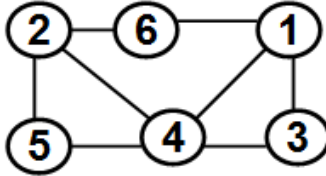
Carlos Martinez



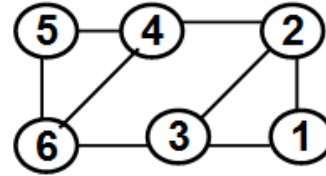
Di Wu



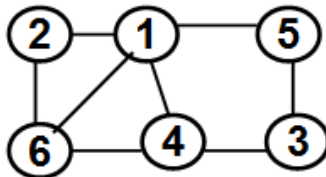
Alnazer Elbedairy



Fei Yang



Osho Oyeyemi

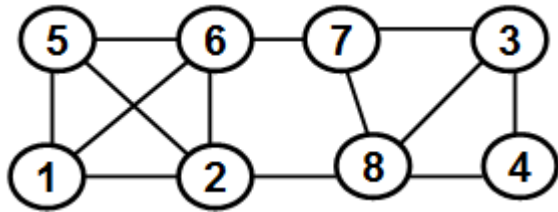


Chen Fang

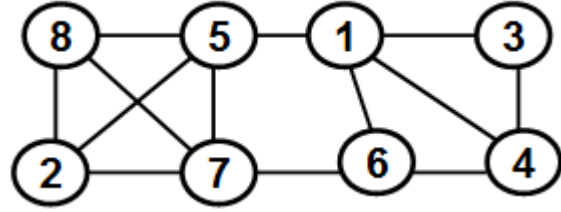
2) (35 pts) Run the Girvan Newman community detection algorithm based on (a) Edge betweenness and (b) Neighborhood Overlap: NOVER scores to determine a partitioning of the graph into communities.

For each of (a) and (b):

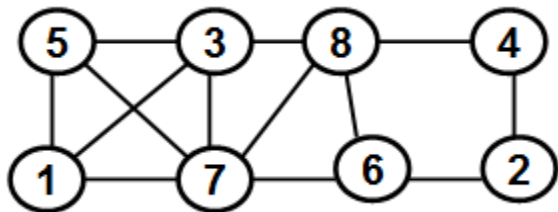
Determine the modularity score for each of the communities and the total modularity score. Also, draw the partitioning hierarchy and indicate the modularity score of the partitions/communities.



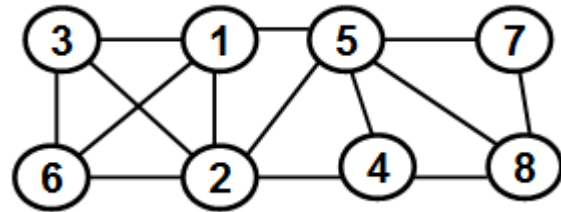
Chen Fang



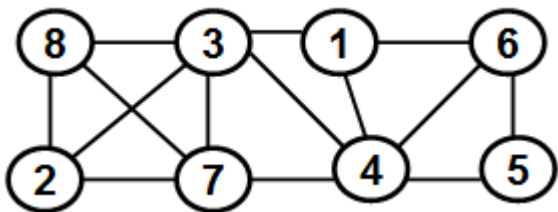
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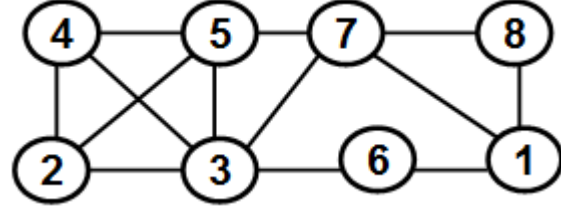
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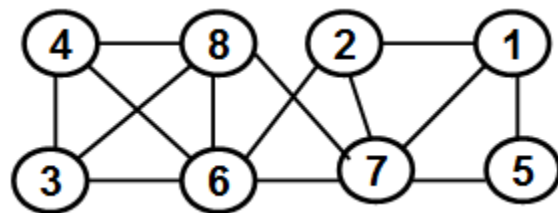
Carlos Martinez



Osho Oyeyemi

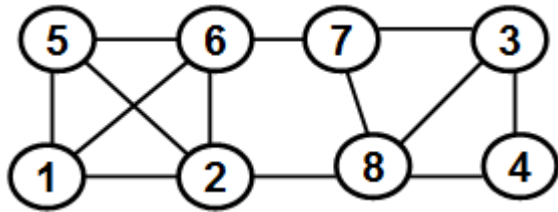


Li-Jing Chang

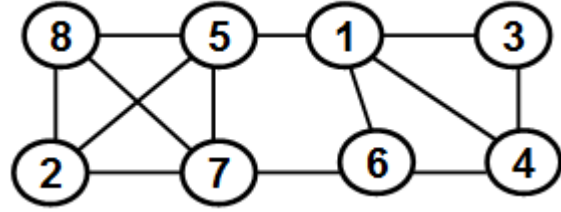


Fei Yang

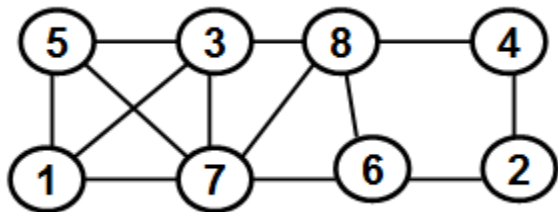
- 3) (30 pts) (a) Determine the threshold NOVER score (minimum NOVER score) that would guarantee the satisfaction of the **strong triadic closure** property for the edges in the following graph.
 (b) Using the threshold NOVER score determined, identify the strong and weak ties.
 (c) Determine a partitioning 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.



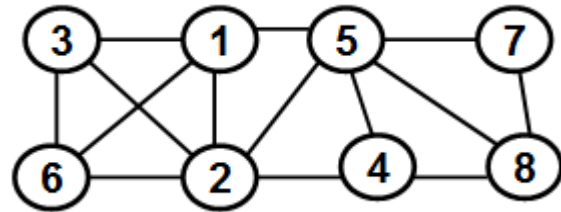
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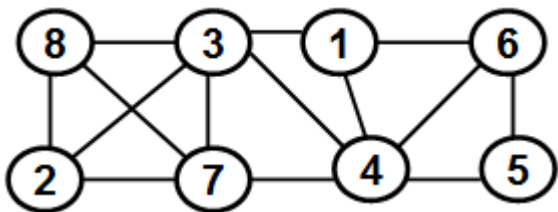
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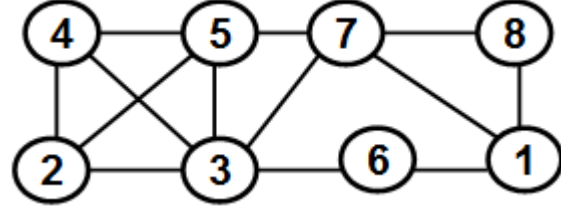
Di Wu



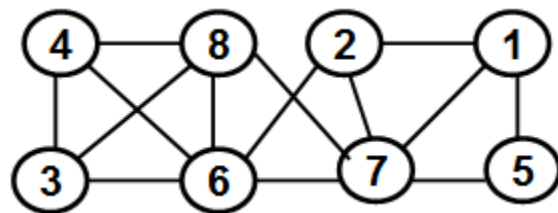
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Fei Yang