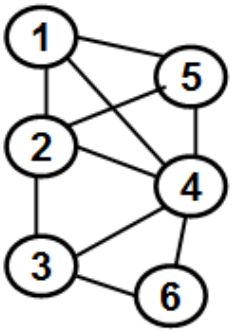
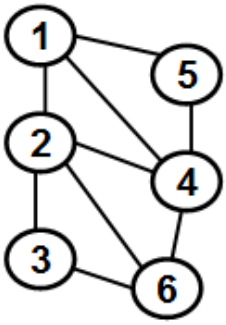
Student Name: _____ J#: _____

CSC 641 Network Science, Spring 2017
Exam 1 (Take Home: Due: Feb. 21, 2017: 4 PM) **Total: 200 pts**

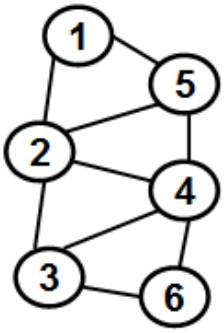
A) **(100 pts)** For the graph given below:
(1 - 10 pts) Determine the spectral radius ratio for node degree.
(2 - 20 pts) Determine the average local clustering coefficient of the vertices in the graph.
(3 - 15 pts) Determine the algebraic connectivity of the graph.
(4- 20 pts) Determine the Estrada index for protein folding for the graph assigned to you as well as determine the folding effectiveness.
(5 - 15 pts) Determine the number of paths of length 4 between vertices 1 and 3.
(6 - 20 pts) Determine the bipartivity index of the graph, the two partitions and identify the frustrated edges, if any.



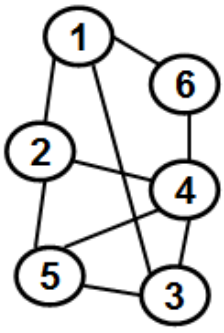
Ashley Abraham



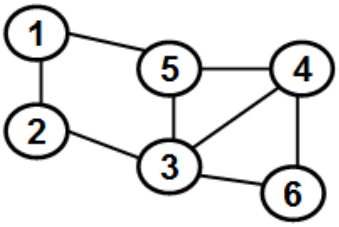
Jonathan Adams



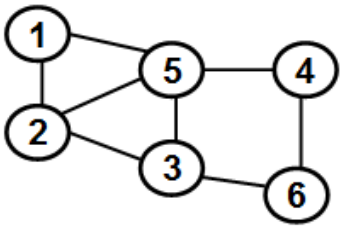
Uzochukwu Akabueze



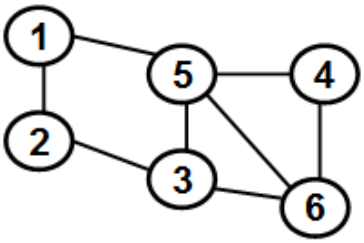
Mahzabin Akhter



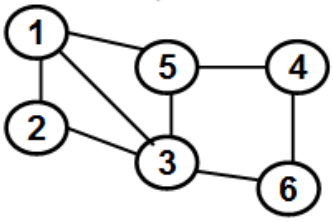
Omar Aljawfi



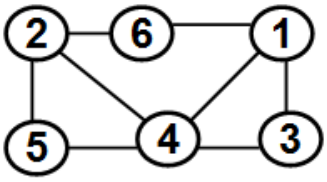
Bejnamin Garlington



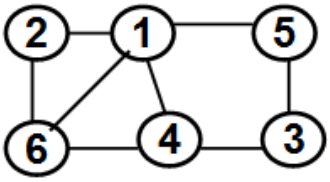
Md Mohiuddin Hasan



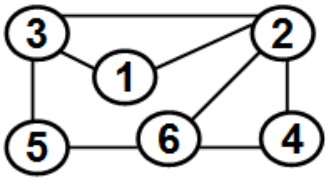
Anthony Lam



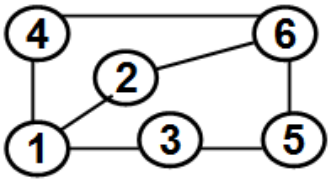
Peter Lowe



Md A. Rahman



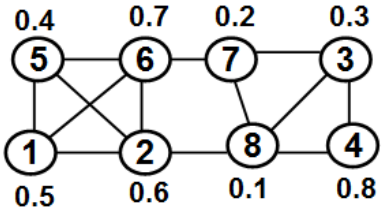
Maruful A. Sumon



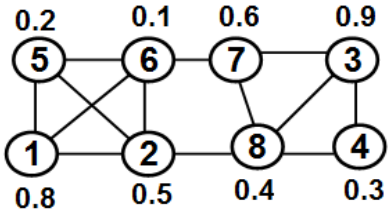
Ying Zhang

Student Name: _____ J#: _____

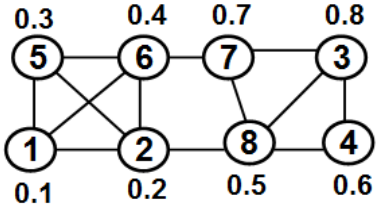
B) (40, 60 pts) Determine the **maximal node matching** and **maximal assortative matching** for the following graph. Determine the following for each of the above: (i) the set of edges constituting the matching (ii) the % of node matches (iii) assortative index of the matching.



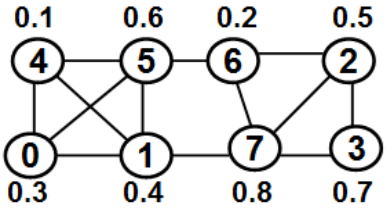
Ashley Abraham



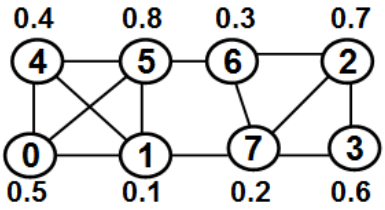
Jonathan Adams



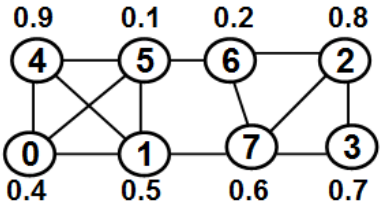
Uzochukwu Akabueze



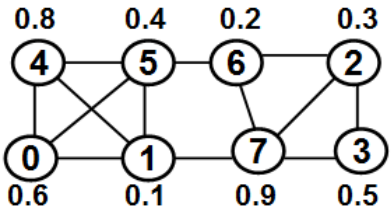
Omar Aljawfi



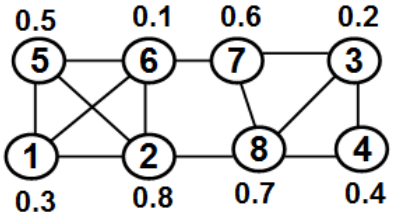
Bejnamin Garlington



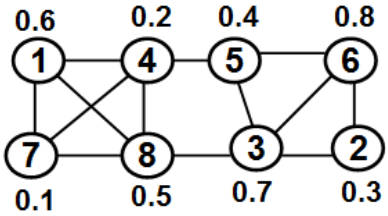
Md Mohiuddin Hasan



Anthony Lam



Peter Lowe



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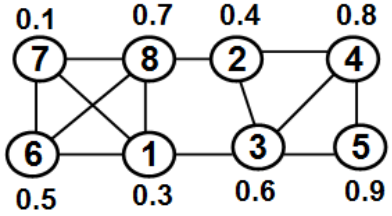

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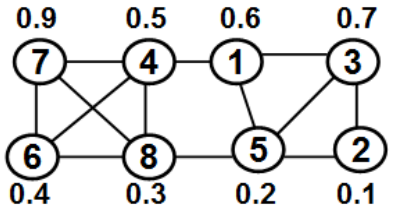

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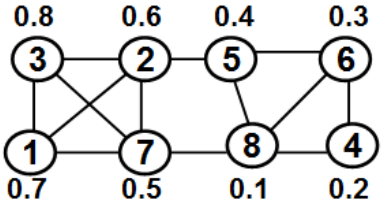

Mahzabin Akhter