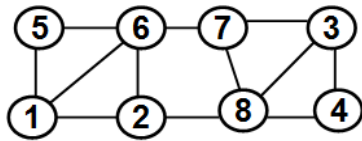


CSC 641 Network Science, Spring 2017
Exam 2 (Take Home: Due: March 28, 2017: 4 PM)

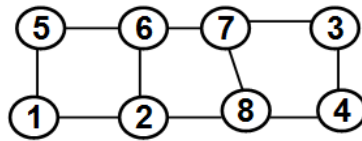
Total: 125 pts

Print this Exam, Insert your answer sheets in between the questions and submit the final exam with all papers stapled.

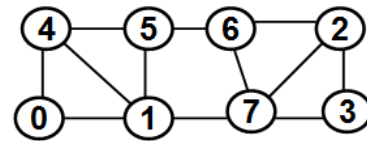
- 1) (40 pts) For the graph assigned to you:
- Find the LCC'DC values for the vertices
 - Use the Node BWC java executable program to determine the BWC values for the vertices
 - Find the Pearson's correlation coefficient (using the formula) between the LCC'DC and the BWC values.
 - Fit a linear regression line for $BWC = f(LCC'DC)$ and determine the slope and intercept as well as the R2 of the fit.
 - Use the regression line of (d) to predict the BWC values based on the actual LCC'DC values. Determine the Standard Error (SER) for the predicted BWC values vis-a-vis the actual BWC values determined in (b).



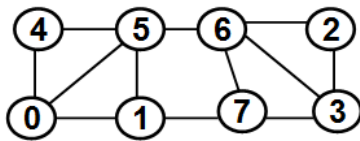
Ashley Abraham



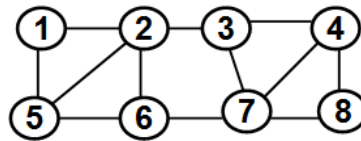
Jonathan Adams



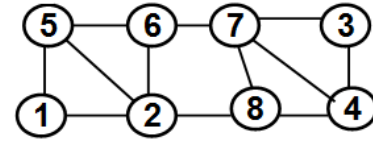
Uzochukwu Akabueze



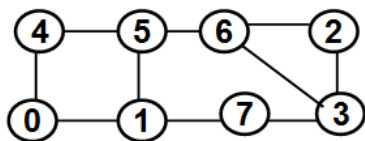
Mahzabin Akhter



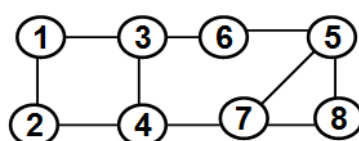
Omar Aljawfi



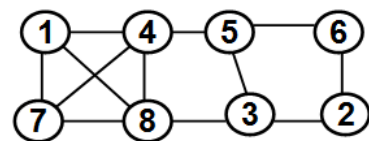
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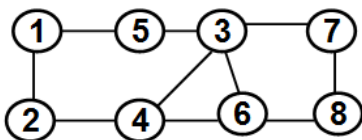
Md Mohiuddin Hasan



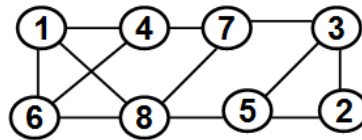
Anthony Lam



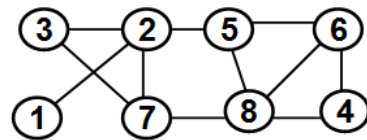
Peter Lowe



Md A. Rahman



Maruful A. Sumon

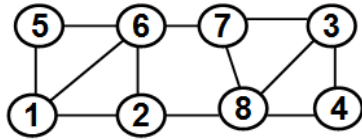


Ying Zhang

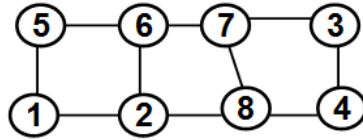
Student Name: _____

J#: _____

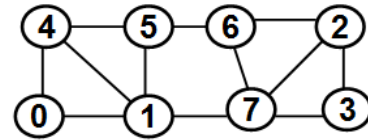
2) (25 pts) For the graph assigned to you, use the Breadth First Search algorithm-based approach to determine the BWC of a vertex with respect to the pair y and z: i.e., $BWC(X; Y \text{ and } Z)$.



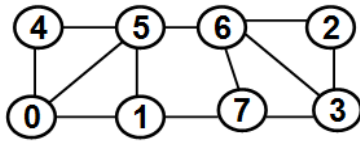
Ashley Abraham



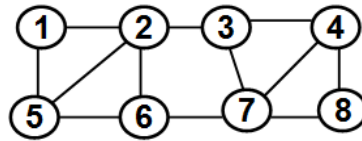
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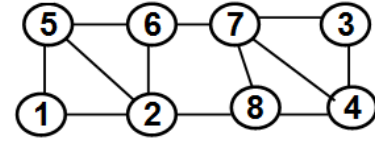
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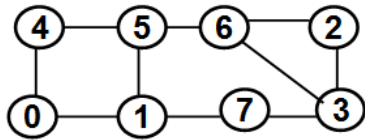
Mahzabin Akhter



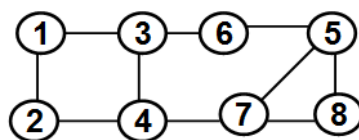
Omar Aljawfi



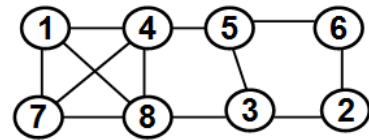
Bejnamin Garlington



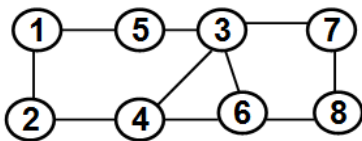
Md Mohiuddin Hasan



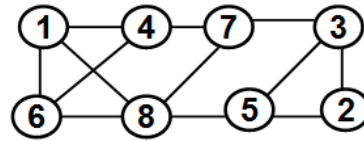
Anthony Lam



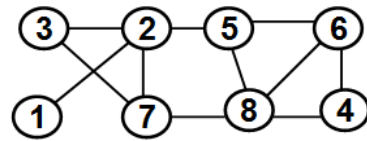
Peter Lowe



Md A. Rahman



Maruful A. Sumon



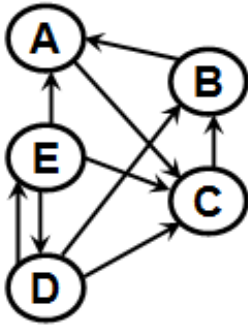
Ying Zhang

Student	X	Y and Z	Student	X	Y and Z
Ashley Abraham	7	1 and 3	Jonathan Adams	7	1 and 3
Uzochukwu Akabueze	7	0 and 2	Mahzabin Akhter	7	0 and 3
Omar Aljawfi	7	1 and 8	Bejnamin Garlington	7	1 and 3
Md Mohiuddin Hasan	6	0 and 2	Anthony Lam	7	1 and 8
Peter Lowe	3	0 and 2	Md A. Rahman	6	1 and 8
Maruful A. Sumon	7	1 and 3	Ying Zhang	8	1 and 4

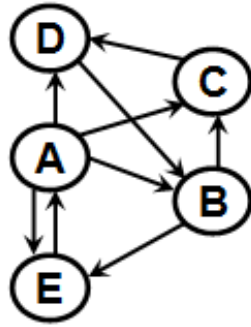
3) HITS: 30 pts

Rank the vertices of the following graph using the HITS algorithm. Find the Authority Scores and Hub Scores of the vertices. Also, if the directed graph has bi-directional edges between two vertices u and v , determine which of the two directed edges ($u \rightarrow v$ and $v \rightarrow u$) dominate.

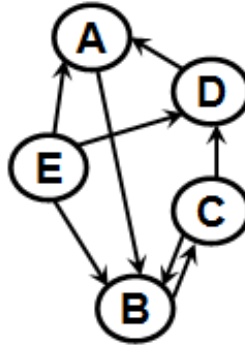
Proceed for four iterations or you could stop if the values converge earlier.



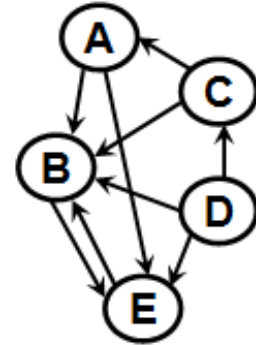
Ashley Abraham



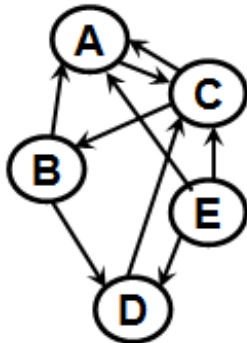
Jonathan Adams



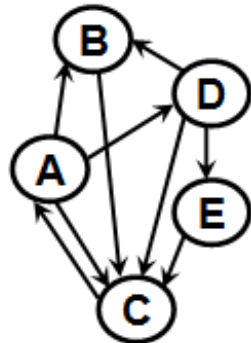
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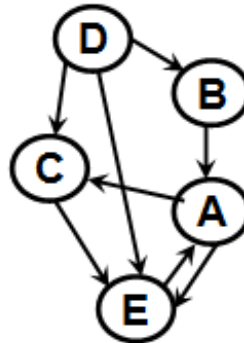
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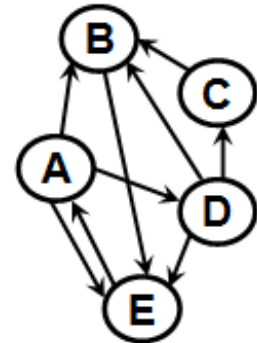
Omar Aljawfi



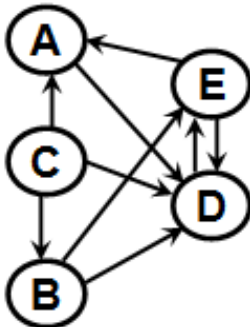
Bejnamin Garlington



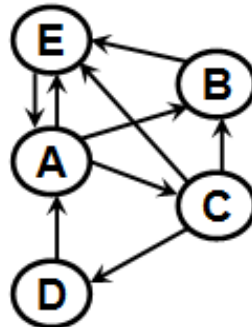
Md Mohiuddin Hasan



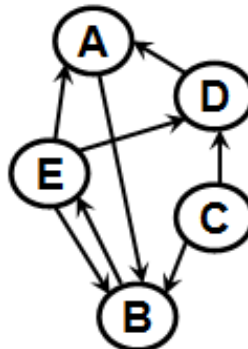
Anthony Lam



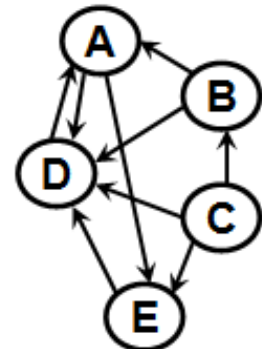
Md A. Rahman



Maruful A. Sumon



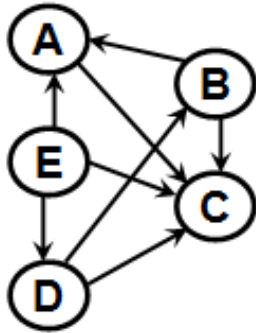
Ying Zhang



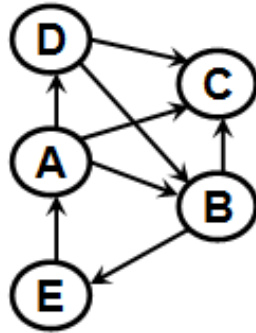
Peter Lowe

4) Page Rank: 30 pts

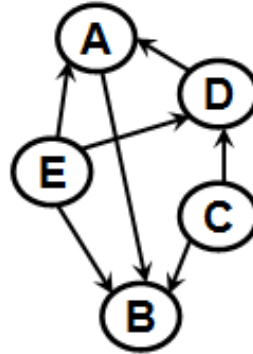
Find the Page Rank scores of the vertices for the directed graph assigned to you. Write the Page Rank formulation for each vertex and show the results of the iterations (calculated in Excel) until the values converge to the first decimal.



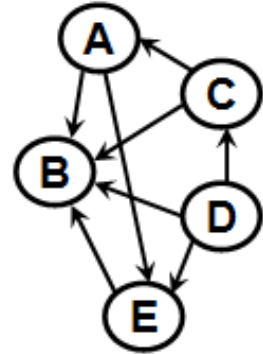
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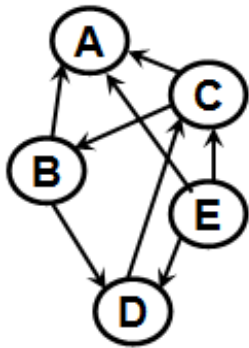
Jonathan Adams



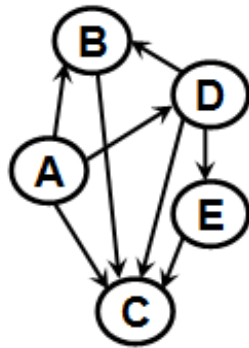
Uzochukwu Akabueze



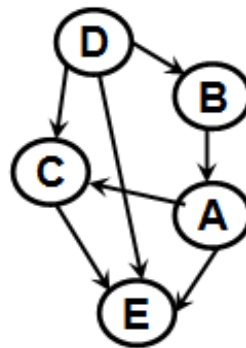
Mahzabin Akhter



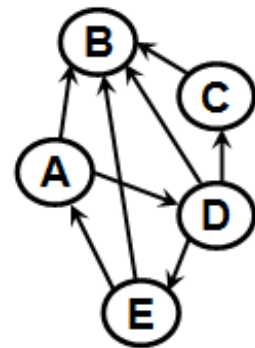
Omar Aljawfi



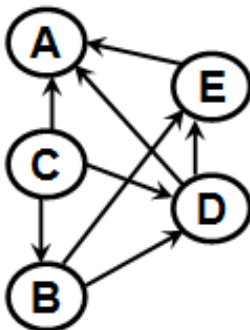
Bejnamin Garlington



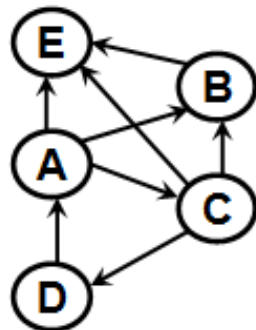
Md Mohiuddin Hasan



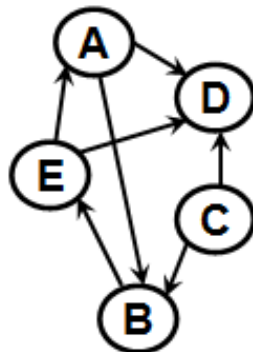
Anthony Lam



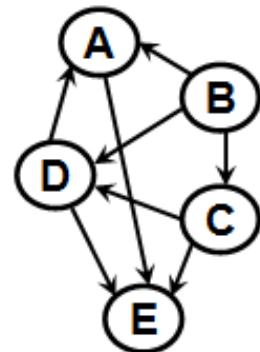
Md A. Rahman



Maruful A. Sumon



Ying Zhang



Peter Lowe