

CSC 641 Network Science, Fall 2017

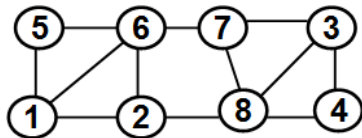
Exam 2 (Take Home: Due: Oct. 24, 2017: 6 PM)

Total: 125 pts

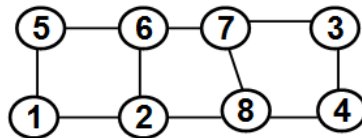
Print this Exam, Insert your answer sheets in between the questions and submit the final exam with all papers stapled.

1) (40 pts) For the graph assigned to you:

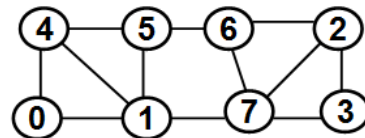
- (a) Find the LCC'DC values for the vertices
- (b) Use the Node BWC java executable program to determine the BWC values for the vertices
- (c) Find the Pearson's correlation coefficient (using the formula) between the LCC'DC and the BWC values.
- (d) Fit a linear regression line for $BWC = f(LCC'DC)$ and determine the slope and intercept as well as the R2 of the fit.
- (e) 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).



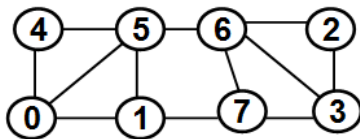
Alton Franklin



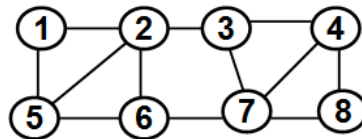
Chirone Gamble



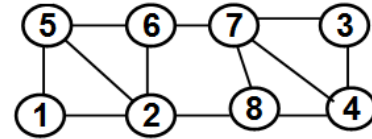
Robin Ghosh



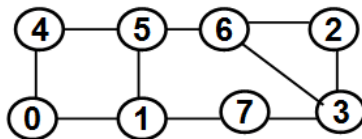
Eric Jackson



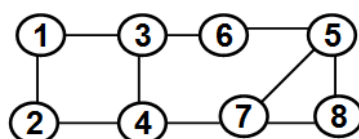
Jonathan Townes



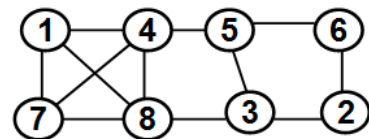
Shengtan Wu



Roman Zubatiuk



Jamoris Miller

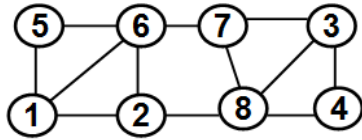


Cheronika Manyfield-Donald

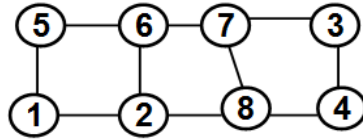
Student Name: _____

J#: _____

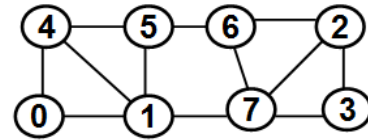
2) (25 pts) For the graph assigned to you, use the Breadth First Search algorithm-based approach to determine the BWC of a vertex with respect to the pair y and z: i.e., $BWC(X; Y \text{ and } Z)$.



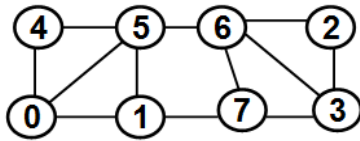
Alton Franklin



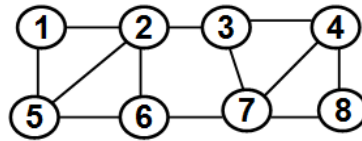
Chirone Gamble



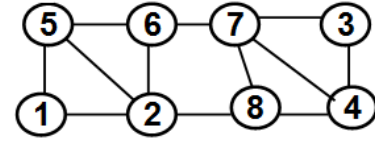
Robin Ghosh



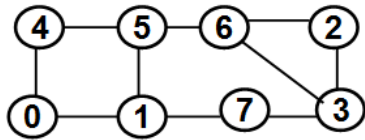
Eric Jackson



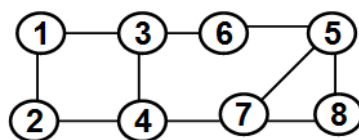
Jonathan Townes



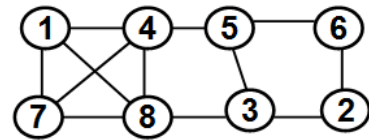
Shengtan Wu



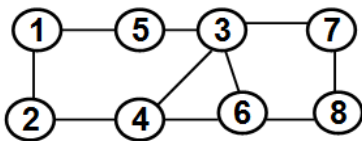
Roman Zubatiuk



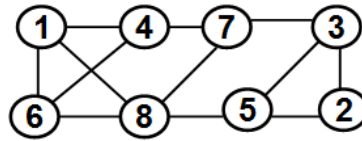
Jamoris Miller



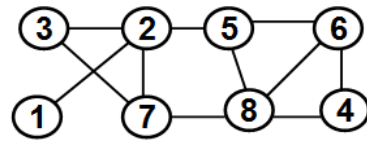
Cheronika Manyfield-Donald



Md A. Rahman



Maruful A. Sumon



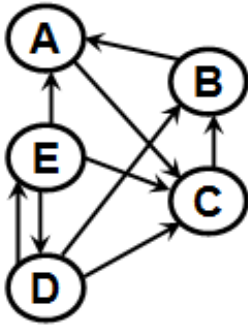
Ying Zhang

Student	X	Y and Z	Student	X	Y and Z
Alton Franklin	7	1 and 3	Chirone Gamble	7	1 and 3
Robin Ghosh	7	0 and 2	Eric Jackson	7	0 and 3
Jonathan Townes	7	1 and 8	Shengtan Wu	7	1 and 3
Roman Zubatiuk	6	0 and 2	Jamoris Miller	7	1 and 8
Cheronika Manyfield	3	1 and 2			

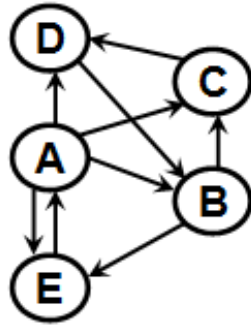
3) HITS: 30 pts

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.

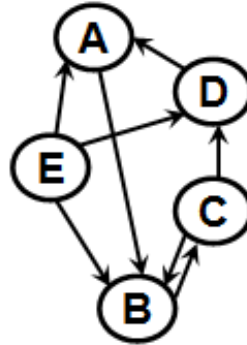
Proceed for four iterations or you could stop if the values converge earlier.



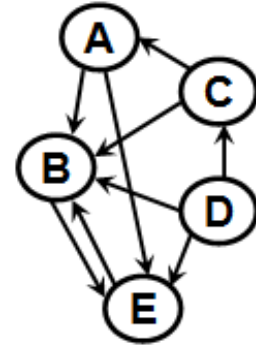
Alton Franklin



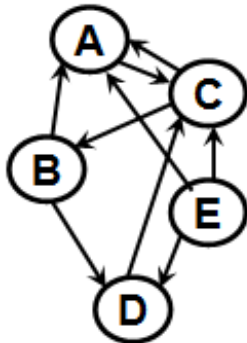
Chirone Gamble



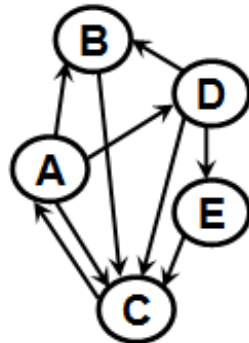
Robin Ghosh



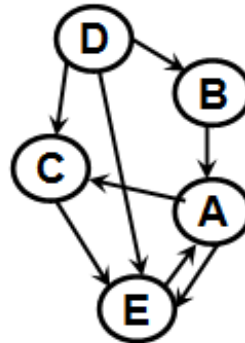
Jamoris Miller



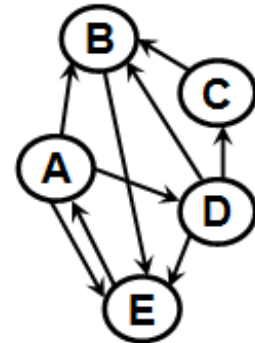
Eric Jackson



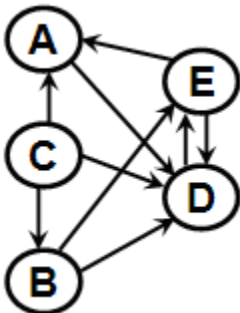
Jonathan Townes



Shengtan Wu



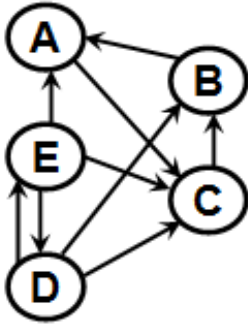
Roman Zubatiuk



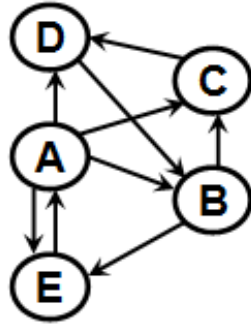
Cheronika Manyfield

4) Page Rank: 30 pts

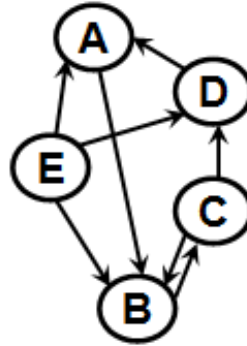
Find the Page Rank scores of the vertices for the directed graph assigned to you. Write the Page Rank formulation for each vertex and show the results of the iterations (calculated in Excel) until the values converge to the first decimal.



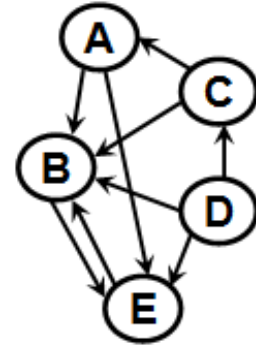
Alton Franklin



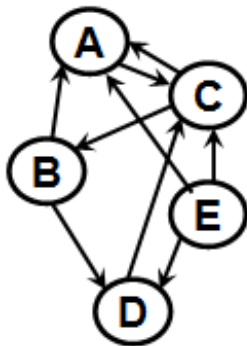
Chirone Gamble



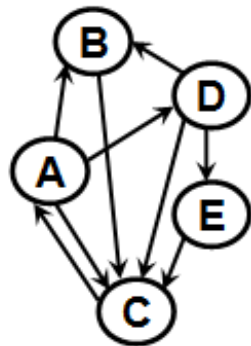
Robin Ghosh



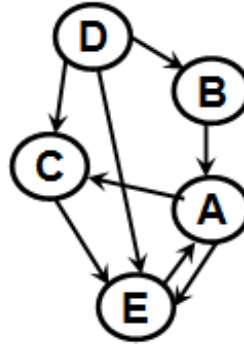
Jamoris Miller



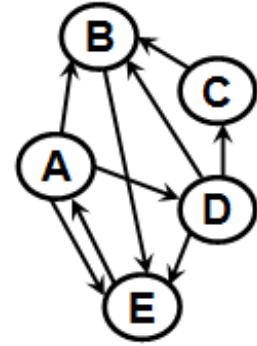
Eric Jackson



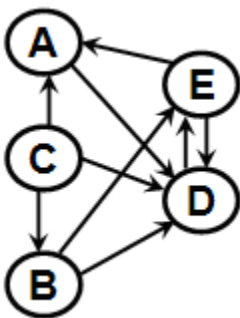
Jonathan Townes



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Cheronika Manyfield