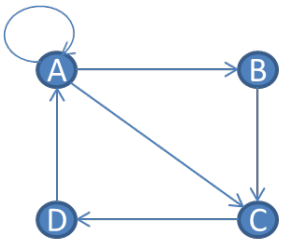
Name: _____ USC ID: _____

INF 553 – Spring 2018

Quiz 8: Link Analysis (10 points), 15 minutes

Consider the following directed graph. Assume **no** teleporting is applied in PageRank computation.



1. [2 points] Write the transition matrix M of the graph.

	A	B	C	D
A	1/3	0	0	1
B	1/3	0	0	0
C	1/3	1	0	0
D	0	0	1	0

2. [8 points] Compute PageRank of nodes of the graph using **Gaussian Elimination**. **Show your work.**

Gaussian Elimination. (M-I) v = 0 (2 points)

$$M - I = \begin{bmatrix} -2/3 & 0 & 0 & 1 \\ 1/3 & -1 & 0 & 0 \\ 1/3 & 1 & -1 & 0 \\ 0 & 0 & 1 & -1 \end{bmatrix} \rightarrow \begin{bmatrix} 1 & 0 & 0 & -3/2 \\ 0 & 1 & 0 & -1/2 \\ 0 & 0 & 1 & -1 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

→A-3/2D=0 (2 points)
B-1/2D=0
C-D=0
A+B+C+D=1

$$\rightarrow v = \begin{bmatrix} 3/8 \\ 1/8 \\ 1/4 \\ 1/4 \end{bmatrix}$$ (4 points)