# Network Science

## HW-2 (12 pts)

### Exercise 1 (8 pts)

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| Consider the directed graph on the right and take the jumping probability . Answer the following questions about PageRank for this graph (2 points for each correct answer). | ① ②  ③ |

1. What is the matrix for the random walk on the graph?
2. What is the matrix corresponding the first step of adjustment?
3. What is the matrix corresponding to the second step of adjustment?
4. Which of the following vectors is a stationary distribution vector for ?

### Exercise 2 (4 pts)

Consider the network of web pages below and run one round of computing hub and authority weights (without normalization). That is, assuming that all initial authority weights and all initial hub weight are equal to 1, apply first the authority update rule and then apply the hub update rule. Fill in the table of resulting weights below (2 points for the correct authority weights and 2 points for the correct hub weights).

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|  | |  |  |  | | --- | --- | --- | | Page | Authority | Hub | | A |  |  | | B |  |  | | C |  |  | | D |  |  | | E |  |  | | F |  |  | | G |  |  | | H |  |  | | I |  |  | |