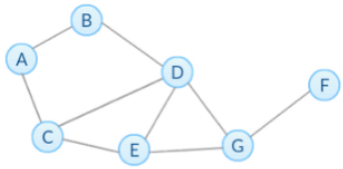
# Module 3 Quiz

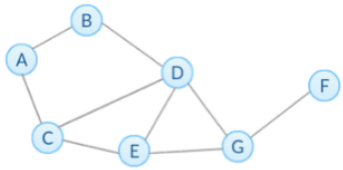
**TOTAL POINTS 10**

1. Based on the network below, what is the degree centrality of node D? 1 point



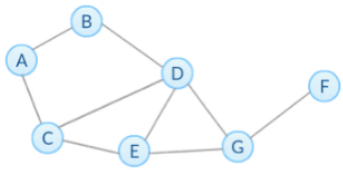

- 0.57
- 0.50
- 0.67
- 0.42

2. Based on the network below, what is the closeness centrality of node G? 1 point



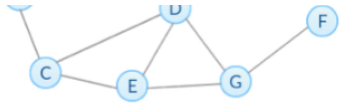

- 0.6
- 0.875
- 0.7
- 0.75

3. Based on the network below, what is the normalized betweenness centrality (excluding endpoints) of node G? 1 point




- 0.67
- 0.33
- 0.47
- 0.24

4. Based on the network below, what is the betweenness centrality without normalization of edge (G,F)? 1 point




- ○ 4
- ○ 5
- ◉ 6
- ○ 7

5. Select all True statements. 1 point

- ☐ In directed networks, in-degree and out-degree centrality of a node are always the same.
- ☐ The node with highest betwenness centrality in a network also has the highest closeness centrality.
- ☑ The closeness centrality of a node describes how far the node is from others.
- ☑ The assumption of degree centrality is that important nodes have more connections.
- ☑ We can use subsets of node-pairs to approximate betweenness centrality.

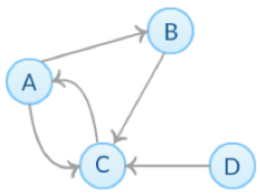
6. Select all True statements about Page Rank (PR) and HITS in directed networks. 1 point

- ☐ Adding out-links of a node will always decrease its PR.
- ☐ Nodes that have outgoing edges to good hubs are good authorities, and nodes that have incoming edges from good authorities are good hubs.
- ☑ Adding in-links of a node will never decrease its PR.
- ☑ The authority and hub score of each node is obtained by computing multiple iterations of HITS algorithm and both scores of most networks are convergent.
- ☐ Nodes with high in-degree centrality have higher PRs than nodes with low in-degree centrality.

7. Given the network below, which value of alpha (damping parameter) listed below in the NetworkX function pagerank maximizes the PageRank of node D? 1 point


- ○ 0.9
- ○ 0.8
- ◉ 0.95
- ○ 0.5

8. Based on the network below, what is the basic PR of node C at step k = 1? 1 point

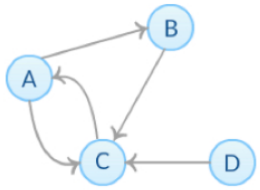



- ◉ 0.625
- ○ 0.125
- ○ 0.5

0.25

0.375

9. Based on the network below, what are the corresponding normalized authority and hub scores of node C correspondingly after two iterations of HITS algorithm? 1 point



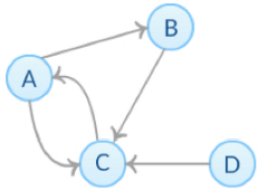

0.8, 0.2

0.33, 0.33

0.4, 0.4

0.57, 0.09

10. Based on the network below, which of the following is NOT True? Check all that apply. 1 point




Node D's authority and hub score after k iterations (k>=1) are always 0.

At step k (k>=1), node A's basic PR is always the same as node C's basic PR at step k-1.

Node D's basic PR at step k (k>=1) is always 0.

At each step, the sum of all nodes' basic PR is always 1.

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