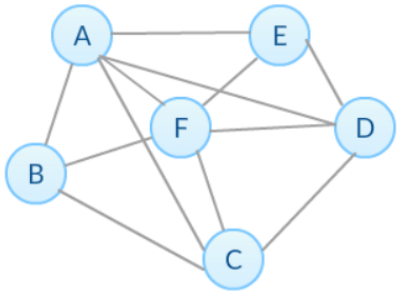
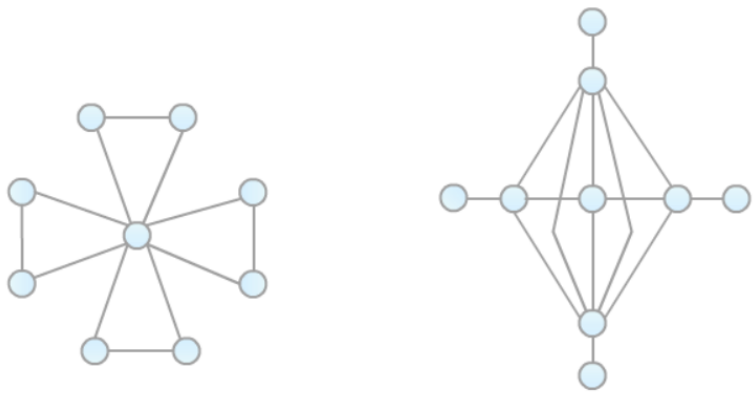
Module 2 Quiz

1. Consider the given network. What is the value of node F's local clustering coefficient? 1 point



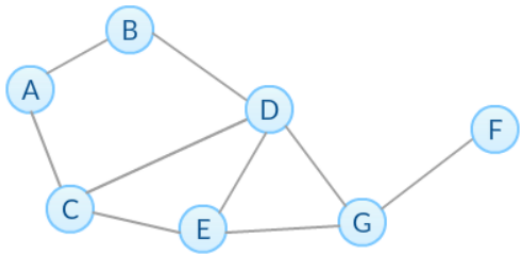
- 0.5
- 0.6
- 0.7
- 0.8

2. Given the following two networks, which of the following is True? 1 point



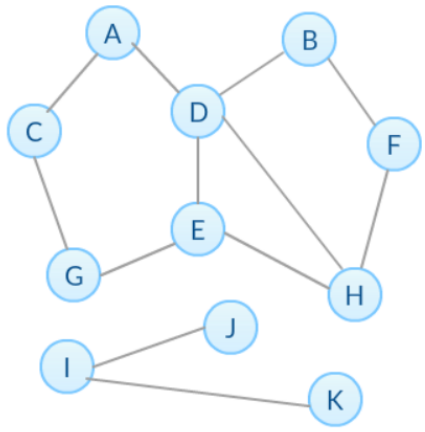
- Network (A) has higher average local clustering coefficient and higher transitivity than (B).
- Network (A) has higher average local clustering coefficient but lower transitivity than (B).
- Network (A) has lower average local clustering coefficient and lower transitivity than (B).
- Network (A) has lower average local clustering coefficient but higher transitivity than (B).

3. Consider the network shown below and select all that apply. 1 point



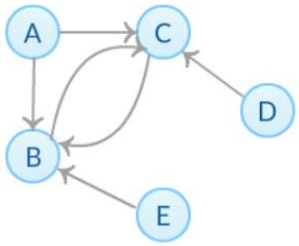
- [x] The radius of this network is half of its diameter.
- [x] The deletion of node G will make the network disconnected.
- [x] If we perform Breadth-First Search (BFS) from node A, the BFS tree we obtain will have a depth of 4.
- [ ] Node C and D are in the center of the network.
- [ ] F is the only in the periphery of the network.
- [x] The eccentricity of node B and C are equal.

4. Select all that apply for the network below. 1 point

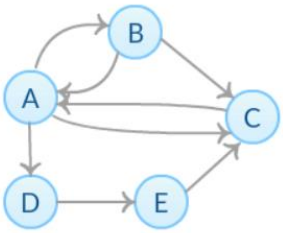


- [x] It is a disconnected graph with 2 connected components.
- [x] If edge (E,G) is removed, the number of connected components will not change.
- [ ] The local clustering coefficient of node I is higher than node J and K.
- [x] We can make the graph connected by adding edge (E,J).

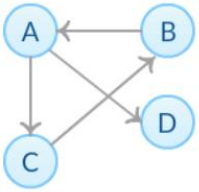
5. Consider three networks (A), (B) and (C) below and select all that apply. 1 point



(A)



(B)



(C)

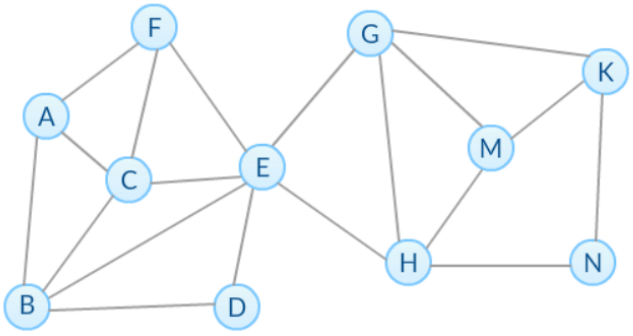
- [x] Only network (B) is a strongly connected graph.
- [ ] We can change network (A) from a weakly connected graph to a strongly connected graph by adding a directed edge from node C to node D.
- [ ] All edges in network (B) are needed for the network to be strongly connected.
- [x] We only need to add one directed edge in order to change network (C) to a strongly connected graph.

6. Which of the following is true about network robustness and connectivity? Select all that apply. 1 point

- [x] The closure of an airport and the cancellation of a flight route are examples of two different kinds of network attacks in the real world.
- [x] Adding more edges to a network always makes it more robust.
- [x] A network that has a high average local clustering coefficient always has a high node connectivity.
- [x] Network robustness measures a network's ability to maintain its connectivity.
- [x] Adding edges to a network can never make the network less robust.

WRONG

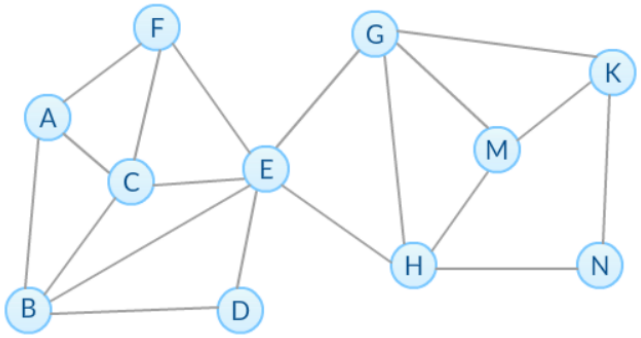
7. Consider the network given below. 1 point



What's the node connectivity of the network?

- (●) 1
- ( ) 2
- ( ) 3
- ( ) 4

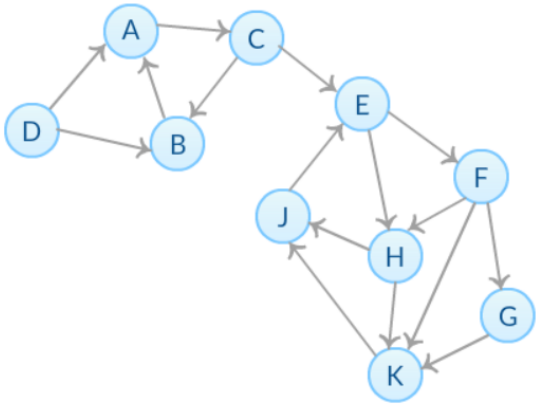
8. Consider the network given below. 1 point



What is the edge connectivity of the network?

- ( ) 1
- (●) 2
- ( ) 3
- ( ) 4

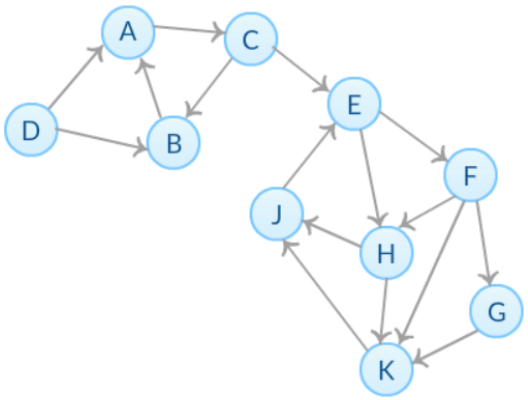
9. The directed network below shows how information can be transferred between nodes. For example, node A can pass the information to node C directly but not vice-versa. If node C wants to send messages to node A, all data must be forwarded by node B. 1 point



What is the total number of simple paths from node D to node K?

- ○ 5
- ○ 6
- ○ 7
- ◉ 8
- ○ 9

10. The directed network below shows how information can be transferred between nodes. For example, node A can pass the information to node C directly but not vice-versa. If node C wants to send messages to node A, all data must be forwarded by node B. 1 point



Suppose we want to block all information channels from node E to node K. Which of the following options achieve this goal? Check all that apply.

- [ ] Removing node H only
- [ ] Removing node G and H
- [x] Removing node F and H
- [ ] Removing edge (H,K)
- [x] Removing edges (H,K) and (E,F)
- [ ] Removing edges (H,K) and (F,G)