Connectivity, Community, and Centrality Analytics

19/19 questions correct

Quiz passed!

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1.

The example given in the lectures of when a power network loses power in large portions of its service area was an example of what?

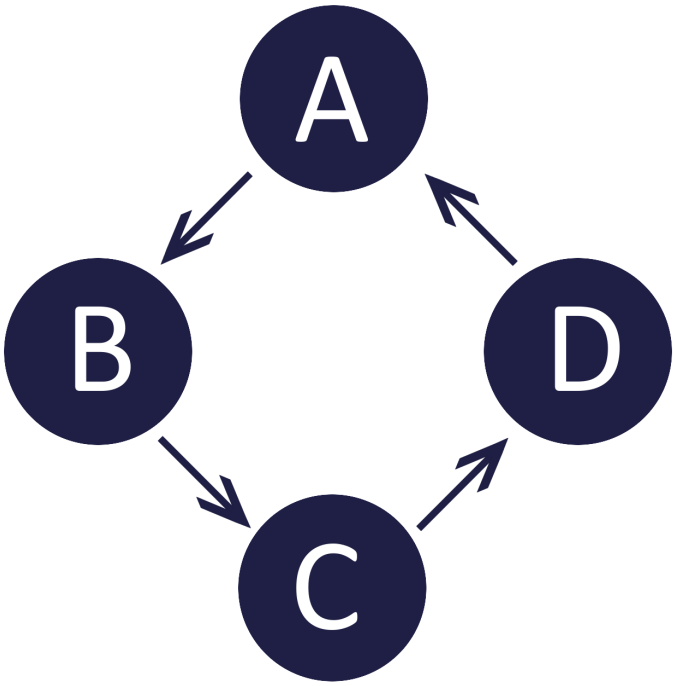
- an attack which causes disconnection of the graph

Well done!

- high levels of connectivity which make it easy to bring a network down
- a problem that can occur when centrality is too high

2.

Is the following graph strongly connected, weakly connected or neither?

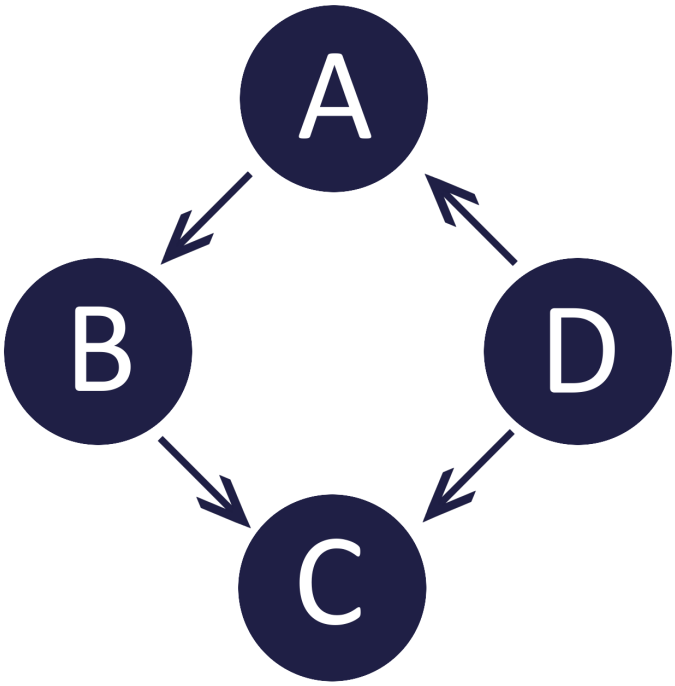


- weakly connected
- neither
- strongly connected

Well done!

3.

Is the following graph strongly connected, weakly connected or neither?



- weakly connected

Well done!

- neither
- strongly connected

4.

If you were going to look for a node which would be most likely to be the target of an attack to disconnect a network, what would be the best characteristic to look for?

- nodes that, if they were removed, would cause the graph to go from strongly connected to weakly connected
- high degree nodes

Well done!

- low degree nodes

5.

What is the out-degree of node B?

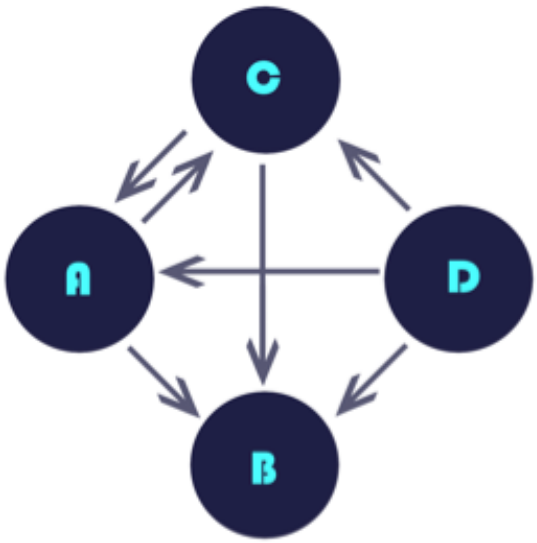
- 0

Well done!

- 1
- 2
- 3

6.

In the graph below, which node is the greatest talker?

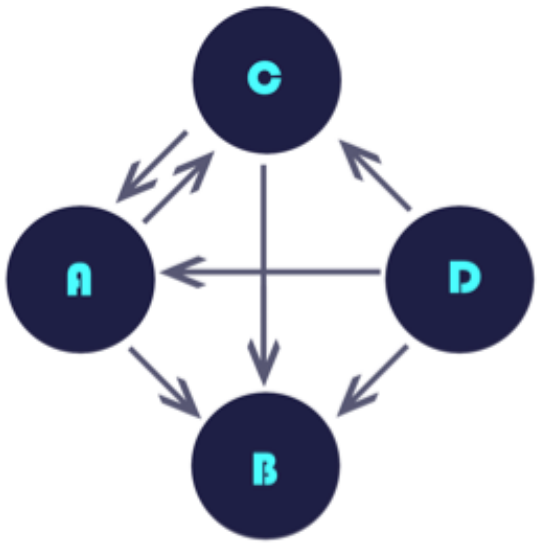


- ○ A
- ○ B
- ○ C
- ○ D

Well done!

✔ 7.

In the graph below, which nodes are the greatest communicators? (Hint: there's a tie)



- ☐ A

Well done!
Right, A has out-degree 2 and in-degree 2.

- ☐ B

Well done!

Hint: Communicators both talk and listen a lot. See this video (https://www.coursera.org/learn/graph-analytics/lecture/LcMt0/connectedness-indegree-and-outdegree) to review.

☐ C

Well done!
Right, C has out-degree 2 and in-degree 2.

☐ D

Well done!
Hint: Communicators both talk and listen a lot. See this video (https://www.coursera.org/learn/graph-analytics/lecture/LcMt0/connectedness-indegree-and-outdegree) to review.

✔ 8.

What would we be looking for if we followed the steps below? Note: we have 2 graphs.

1. Create a table for each graph where, for each node, you list the degree of the node.
2. For each graph, create a histogram indicating how many nodes in that graph have a specific degree (e.g., how many nodes have degree 1? 2? etc.).
3. Use advanced approaches (e.g. Euclidean distances) to compare these two histograms.

○ Centrality

○ Similarity

Well done!

- Community
- Connectivity

✔ 9.

Which of the following are the three type of analytics questions asked about communities?

- [ ] Static

Well done!

- [ ] Evolution

Well done!

- [ ] Prediction

Well done!

- [ ] Connection

Well done!
See this video (https://www.coursera.org/learn/graph-analytics/lecture/aewLb/community-analytics-and-local-properties)to review.

✔ 10.

What type of community analytics question is the following?

Did a community form on twitter around the 2014 World Cup in Brazil?

- Static

- Connection
- Evolution

Well done!

- Prediction

✔ 11.

Which type of community analytics question is the following?

How tightly knit was the 2014 World Cup twitter community on July 13, 2014 (the day of the finals)?

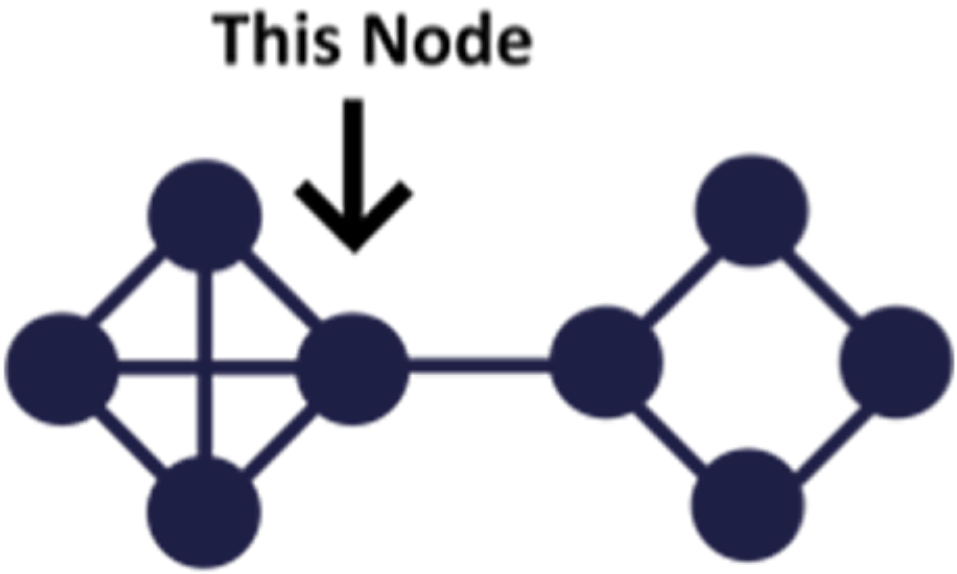
- Evolution
- Static

Well done!

- Prediction
- Connection

✔ 12.

What is the internal degree of the node indicated in the graph below?



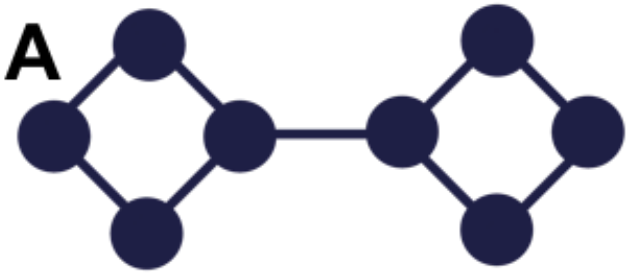
- 1
- 2
- 3

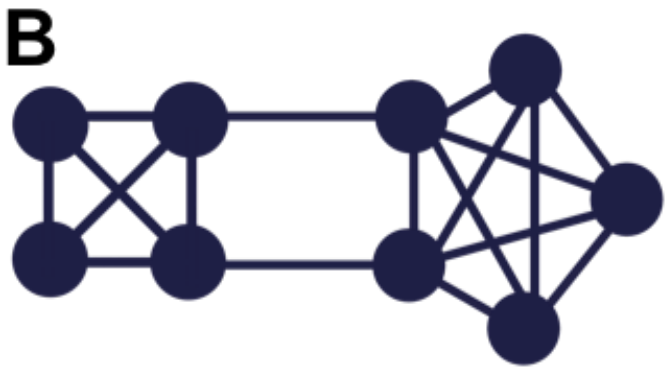
Well done!

- 4

13.

Which of the two graphs below is more modular?





- A
- B

Well done!

14.

Which of the following community tracking phases usually occurs when a company spins off a start-up?

- Birth
- Split

Well done!

- Merge

- Grow
- Death
- Contract

✔ 15.

An influencer in a network is defined as:

- a node which has heavy weight edges to at least 1/2 of the nodes in the network
- a node which can reach all other nodes quickly

Well done!

- the biggest gossip in the network

✔ 16.

Which of the following are the 2 core “key player” problems that centrality analytics can address?

- [ ] A set of nodes which can reach (almost) all other nodes

Well done!

- [ ] What is the shortest path through a network

Well done!
Hint: While shortest path is the *core* graph analytics problem, it's not a key aspect of centrality. See this video (https://www.coursera.org/learn/graph-analytics/lecture/nNIga/centrality-analytics) to review.

- [ ] Which nodes have the highest ratio of out-degree nodes to in-degree nodes

Well done!
Hint: in-degree and out-degree weren't part of the discussion of centrality. See this video (https://www.coursera.org/learn/graph-analytics/lecture/nNIga/centrality-analytics) to review.

- [ ] Which nodes' removal will maximally disrupt the network

Well done!

✔ 17.

What kind of centrality would you want to analyze in a graph if you wanted to inject information that flows through the shortest path in a network and have it spread quickly?

- ○ Between-ness
- ○ Group
- ○ Degree
- ○ Closeness

Well done!

✔ 18.

What kind of centrality would you want to analyze in a graph if you wanted maximize commodity flow in a network?

- ○ Group
- ○ Closeness

- Degree
- Between-ness

Well done!

19.

What kind of centrality identifies "hubness"?

- Group
- Degree

Well done!

- Between-ness
- Closeness
