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SI 301/Romero

Assignment #2

1. Problem 2

I would expect the B-C edge to be a weak tie. If the B-C edge were a strong tie, it would violate the Strong Triadic Closure property. The STC property is violated if node B has strong ties to nodes E and C, and there is no edge at all connecting E and C, which is true for Figure 3.21.

Problem 3

The Strong Triadic Closure property states that if node A has strong ties to nodes B and C, there is an edge B-C that is likely to form. So, the following group of nodes satisfy this property: A-B-D, B-A-C, D-A-E. Node C, however, violates the STC property because it has strong ties with nodes B and E, yet there is no edge connecting B and E.

Problem 4

Nodes C and E violate the Strong Triadic Closure property. Node C has strong ties to nodes B and E, yet there is no edge connecting B and E. Node E also has strong ties to nodes D and C, and there is no edge connecting D and C as well.

Problem 5

Nodes A and B satisfy the Strong Triadic Closure property. Node A has strong ties to nodes B and C, and there is an edge connecting the two. Node B has strong ties to nodes A and C, and there is an edge connecting the two. Node C satisfies the STC property in terms of nodes C-B-A, but violates the property in terms of nodes A-C-E. Node C has strong ties to nodes A and E, yet there is not edge connecting nodes A and E. All the other nodes do not violate the STC property.

In the diagram above, edge A-B is a strong tie. In order for node A to satisfy the Strong Triadic Closure property, there must be an edge C-B connecting the two nodes (C and B). However, because there are two strong ties from A, any local bridge (A-B) must be a weak tie. Therefore, edge A-B cannot be a local bridge if node A is to satisfy the Strong Triadic Closure property.

* 1. A: 2 (CB and DC) / 6 (BC, BD, BH, HD, HC, DC) = 1/3

B: 1 (CA) / 1 (CA) = 1

C: 2 (AB and DA)/ 3 (AB, AD, BD) = 2/3

D: 1 (CA) / 1 (CA) = 1

E: 1 (GF) / 1 (GF) = 1

F: 1 (EG) / 3 (EG, GL, LE) = 1/3

G: 1 (EF) / 1 (EF) = 1

H: 1 (IJ) / 6 (AL, AI, AJ, IJ, LJ, IL) = 1/6

I: 1 (HJ) / 1 (HJ) = 1

J: 1 (IH) / 3 (IH, HK, IK) = 1/3

K: 0 / 1 (JL) = 0

L: 0 / 3 (HF,HK,FK) = 0

* 1. Bridges: A-H, F-L
  2. Local Bridges (span): H-L (3), K-L (3), J-K (3)
  3. There would be three components if bridges A-H and F-L were removed.
  4. I would measure the strength of the edges in this graph by examining the details of each instant message. First, I would look at the amount of correspondence between each sender and receiver; the more IMs back and forth, the stronger the tie. Also, I would look at the content of the messages. Messages with more content, generally, means more information passed between each trader, so there would be a stronger tie.
  5. I think traders would rather communicate with their strong ties when the network is shocked. Traders with strong ties more regularly share information with each other, so they must appreciate the input of connected traders. So, in a shock, traders would want the best information that they can get, and it will come from their strong ties.
  6. In a shock, it is best to receive as much information as possible to handle the volatility. So, traders may want to communicate with other traders who do not have many common connections with them. Assuming these connections communicate with many other traders (who are not mutual connections), it would be beneficial to get many different perspectives.
  7. Because, in a shock, traders want to communicate with other traders that have different connections, the MLCC on this day would be lower than a normal day. In this situation, the numerator (number of pairs of a trader’s friends who are friends) would be low, ideally. And the denominator (pairs of the trader’s friends) would be high, because he or she wants as much information as possible.