Assignment 05: Strong and Weak Ties

Performance summary

Assessed

Success status	Score	Attempts
Undefined	0 of 100 points	2

Results

Course	Network Theory and Dynamic Systems (SS 2025) ID: 4669112833 / 109901770313435
Test	Assignment 08: Strong and Weak Ties ID: 4597121560

This are your test results

Duration	0h 19m 4s 5/19/2025, 12:14 PM - 5/19/2025, 12:33 PM
Answered	3 of 3 questions (100%)
Your score	0 of 100 points (0%)

0%
Score: 0

Knowledge Tasks (50 points) 2

0%
Score: 0
of 50

go to section

Practical Tasks (50 points) 1

0%
Score: 0
of 50

go to section

Knowledge Tasks (50 points) 0 of 50 points (0%)

Triadic Closure (25 points)

Status	Answered	
Your score	0 / 25	0%

Response

Discuss how triadic closure contributes to the evolution of social networks, detailing the mechanisms by which it operates and providing examples of its application in real-world social networks. Additionally, evaluate the impact of triadic closure on the clustering coefficient of a network.

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Definition and Mechanism:
Triadic closure describes the dynamics of two people beginning to be friends because they have a common friend with whom
they interact frequently. If we denote person A as having connections to both person B and person C, then A's having
connection to both B and C increases the likelihood of a direct link between B and C. Triadic closure has been shown to
be one of the mechanisms of development, growth, and shaping social networks.

Triadic closure operates through the following mechanisms:
- Greater Interaction Opportunities: Combination of social connection groups brings contact with participants to specific
social activities (ex: group chats, social gatherings, get togethers), heightening the probability to form a direct link.
- Influence and Social Trust: A mutual friend double engenders social ties to both persons. A friend can serve as a
bridge or a trusted person so that he/she can support the creation of another link.
- Commonality: Having commons leads to sharing hobbies or interests fostering connections between two people lacking
direct relations
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Real World Examples:
Facebook: Marrying mutual acquaintances using triadic closure suggests new connections to users, which might trigger notifications such as “People You May Know.”
LinkedIn: With many mutual connections, the platform often suggest to users to connect with other relevant specialists.

Impact on Clustering Coefficient:
The clustering coefficient captures how closely the nodes in a graph tend to cluster together. It can be defined as the ratio of the linkages relative to the potential linkages that might exist among a node’s neighbors. Triadic closure increases clustering coefficient directly because it completes triangles which exist in the network graph.

As an illustration, in a network to which A is connected with B and C, B and C’s closure (through triadic closure) form a triangle hence locally and on average cluster forming pentagons are created. This increases local and average clustering coefficients. Networks that have strong triadic closure tendencies also tend to have strong clustering, which isis regarded as the indicator of small-world networks.

Conclusion:
Triadic closure is a fundamental principle in understanding the growth and structure of social networks. It increases the density of the network, support community building, and brings up the reverse of average path length clustering coefficient showing tightly knit community with strong information circulation. Its existence in online systems and real social interactions indicates a broader phenomenon that drives human behavior.

372 words

▸ Solution

The Strength of Weak Ties (25 points)

Status	Answered	
Your score	0 / 25	0%

Response

Explain the concept of the strength of weak ties and how it differs from strong ties in social networks. Discuss Granovetter’s hypothesis on job discovery through weak ties and its implications for career development. How do weak ties function as bridges in social networks, and why are they critical for information propagation?

Concept and Difference from Strong Ties:

Weak ties, as proposed by sociologist Mark Granovetter in his 1973 paper, are infrequently contacted relationships which can yield greater value than strong ties, close connections such as family or best friends.

Key differences:

Enjoying high regard within a close community makes trust and emotional support readily available. These are strong ties. Relevant novel information and opportunities are made available through weak ties since those connections cut across individual social groups.

Granovetter’s Hypothesis on Job Discovery:

Explore the job market through the weak ties in your network. You are most likely to land a job via weak ties, and the logic behind this conclusion is:
- Information that best friends or family share is usually redundant. This group of strong ties exist within the same social cluster.
- To access job leads and unique supportive emerging opportunities, you require someone who is able to withhold novel non-redundant information, which is provided by weak ties and social bridges.

Implications for Career Development:
- Reaching out to new contacts (like attending professional workshops, participating in discussion groups, and interacting with former students) enhances access to new career initiatives and job openings.
- Largely, maintaining weak ties enhances a person's social capital which is important for career development and business innovation.

Weak Ties as Bridges and Information Propagation:
- Bridges: In most networks, weak ties serve as a structural bridge which means they are the sole link between two unconnected groups. Because of this bridging function, they are able to convey information within clusters of people that would not otherwise communicate.
- Critical for Information Flow: Because weak ties connect disparate regions of a network, they are important for more effective information distribution. The absence of weak ties stifles local circulation of information and leads to the inhibition of overall network connectivity.

For example, Consider a job seeker who only has close friends and uses them as potential contacts. These friends would most likely use the same job boards and have the same company gossip. However, casual acquaintances from different cities might let them know of a role at a Start Up that’s hiring, something the close friends do not know about.

In conclusion, the latent potential of weak ties is that they can connect disparate social networks and aid in the dissemination of scarce important information. In a social network, such ties have become crucial in enabling the search for employment, enabling innovation, and the fast spread of concepts as they mark the basis of effective networking and information sharing.

410 words

▸ Solution

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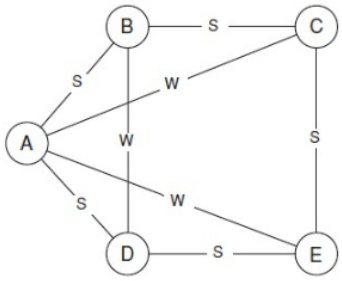
Practical Tasks (50 points) 0 of 50 points (0%)

The Strong Triadic Closure Property (50 points)

Status	Answered	
Your score	0 / 50	0%

Response

The following figure depicts a social network. Are there any nodes that fail to meet the criteria of the Strong Triadic Closure property? If so, which node(s) are they? Provide a detailed explanation of your answer.



The illustrated social network with nodes A–E and edges S (strong tie) or W (weak tie) is cited in the problem. The STC property states that if a node has strong ties with two neighbors, then those neighbors must share a weak tie. A node violates STC if its two strong neighbors lack an edge (no inter-connection, strongly or weakly). We analyze each node sequentially.

- Node A: A has strong ties to B and D. In the graph, B and D are weakly tied (edge B–D is labeled 'W'). Since A's two strong neighbors are connected by at least a weak tie, A does not violate STC.

- Node B: B has strong ties to A and C. A and C are weakly tied (edge A–C is labeled 'W'). Thus B's two strong neighbors are adjacent by weak tie, so B also satisfies STC.

- Node C: C has strong connections with both B and E. However, there is no edge between B and E in the graph (B and E have no weak or strong tie). This precisely triggers the violation condition: C's two strong neighbors do not have any tie. Hence, C violates the strong triadic closure property.

- Node D: D is strongly tied to A and E. There is no edge joining A and E in the network. As D's neighbors A and E aren't directly connected, D does not satisfy the STC requirement so D violates the property.

- Node E: E is strongly tied to C and D. C and D do not share an edge in the graph. Thus, E is also referred to as having two strong neighbors who do not constitute a tie, so E violates the strong triadic closure property.

As I conclude, nodes C, D, and E do not comply with the criteria of strong triadic closure. Each of these nodes possesses two strong neighbors as defined within the network which by definition breach the STC property.

Answer: The nodes that violate the strong triadic closure property are C, D, and E.

276 words

▸ Solution

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Test execution

Information

Availability: Expired at 5/20/2025, 11:59 PM

Max. attempts: Unlimited

Results of this test are visible to administrators and tutors of this course.

Start test

▸ Change log

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