Social Networks in Social Science Research: Theory and Practice

Anna Sokolova, MSc

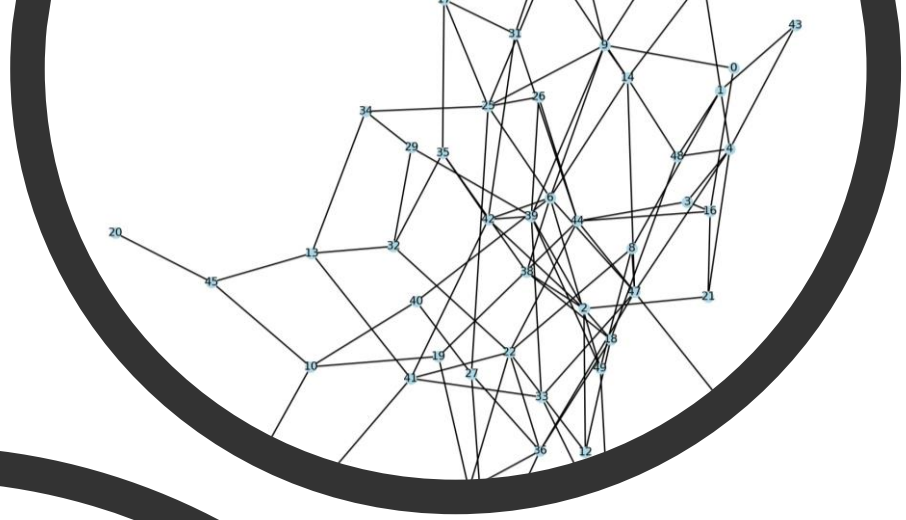
21.02.2024

Session 2

1. Brief repetition
2. Text discussion
3. Article presentation: Causal Inference in SNA
4. Next session

Guess the metric

1.



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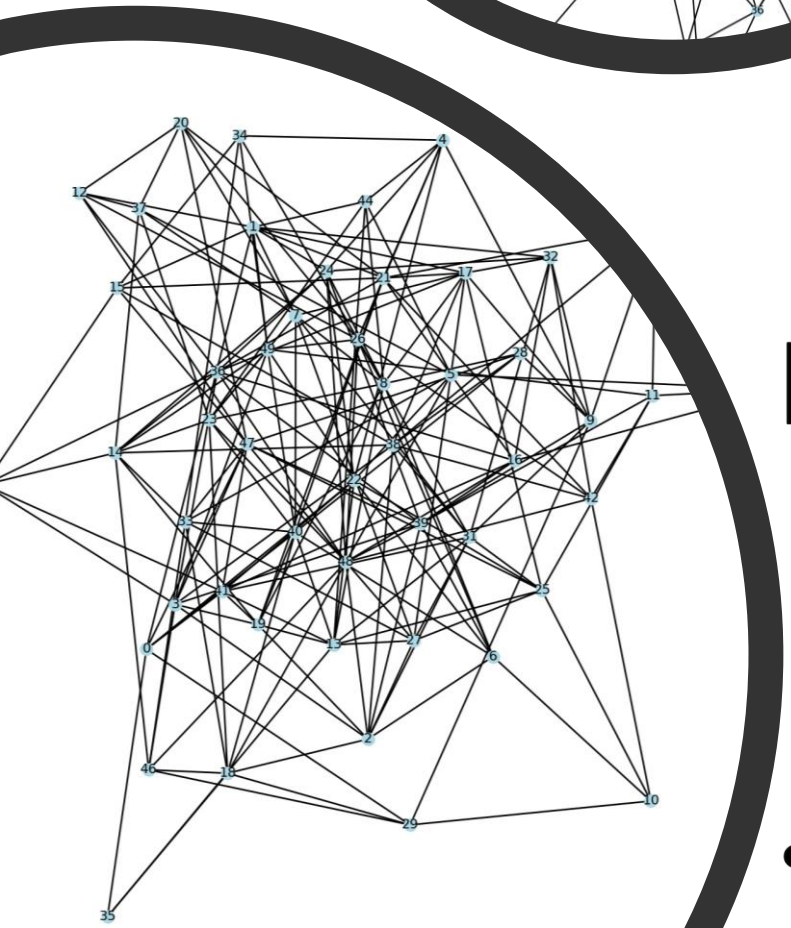

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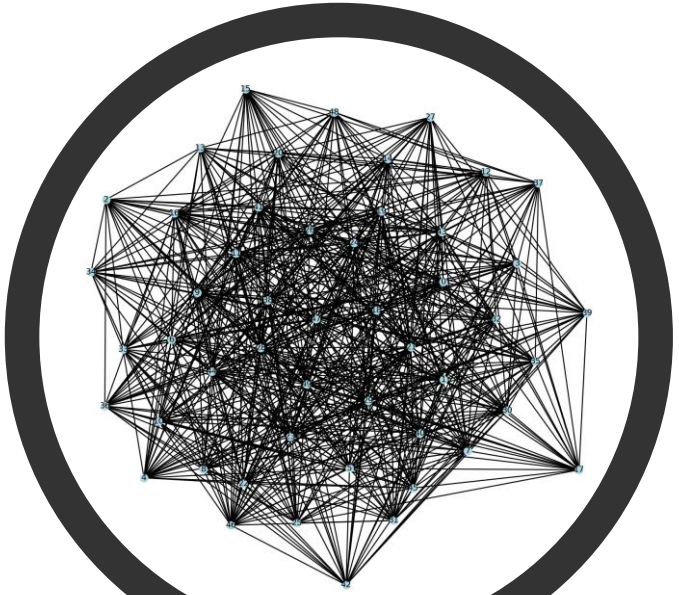

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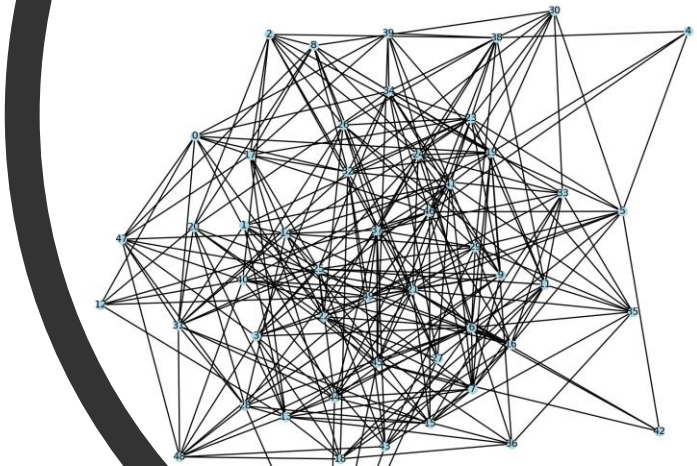

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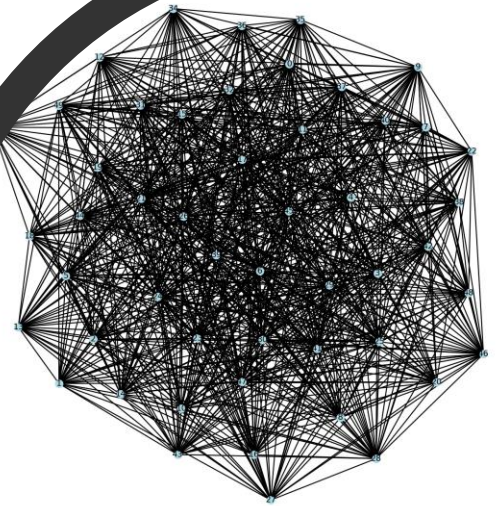

Density

- Quantifies how close a network is to being fully connected.
- $$\text{Density} = \frac{2 \times \textit{Number of Edges}}{\textit{Number of Nodes} \times (\textit{Number of Nodes} - 1)}$$
- Ranges from 0 to 1
  (0 – no edges, 1 – fully connected network).

Density

1.

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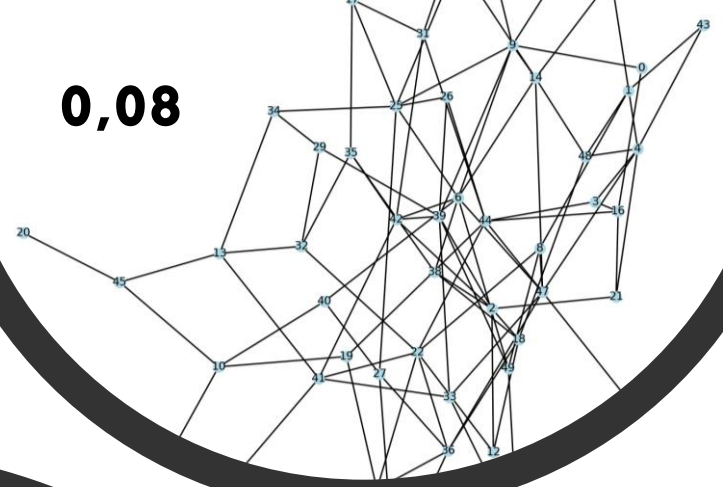

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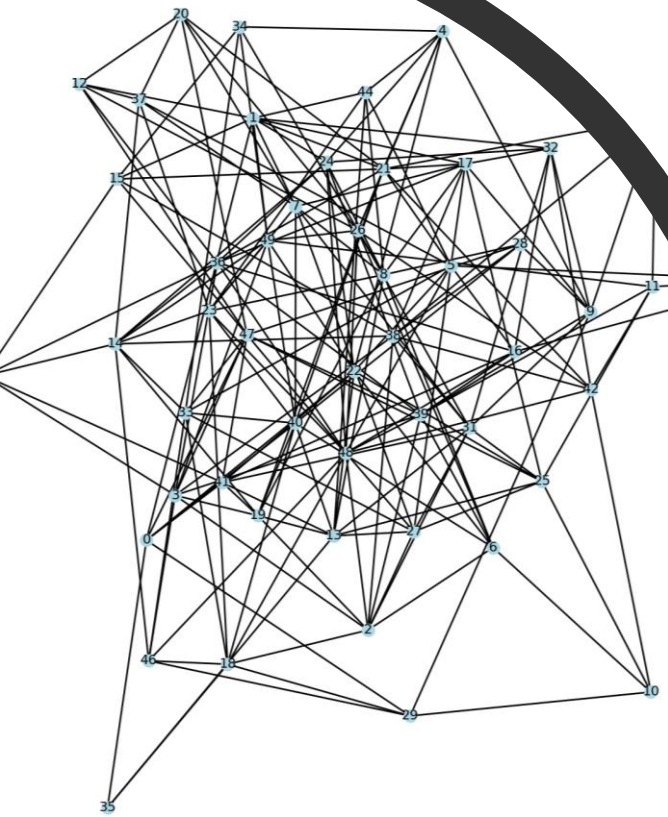

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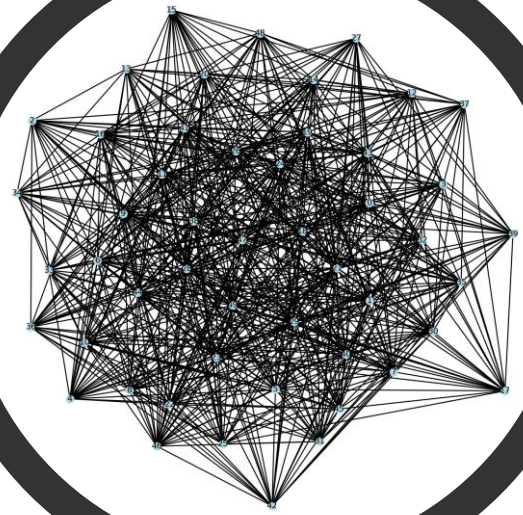

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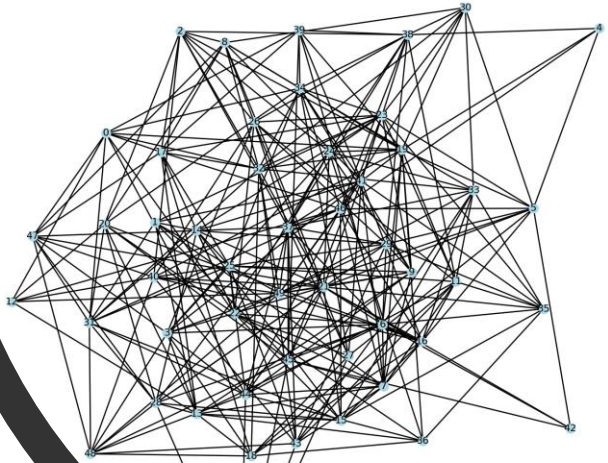

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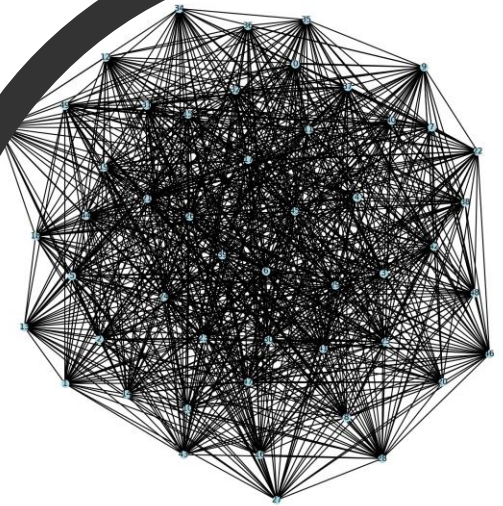

Density

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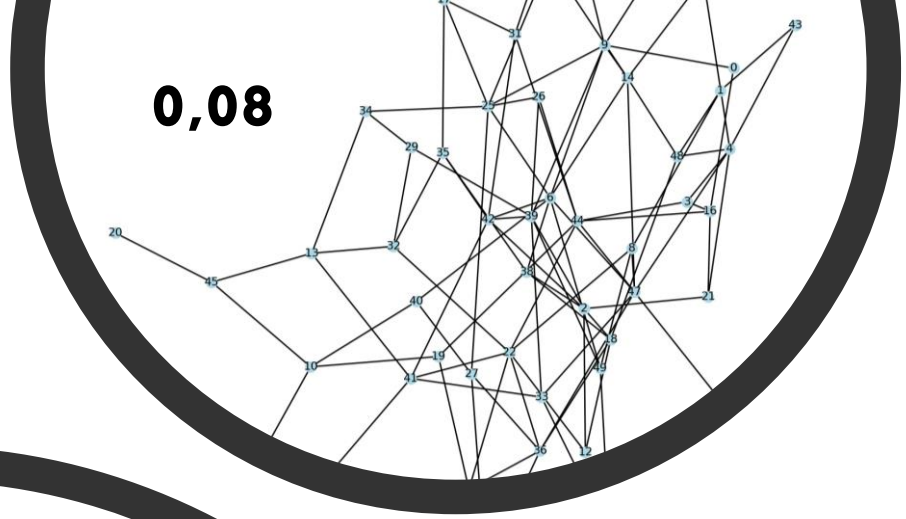

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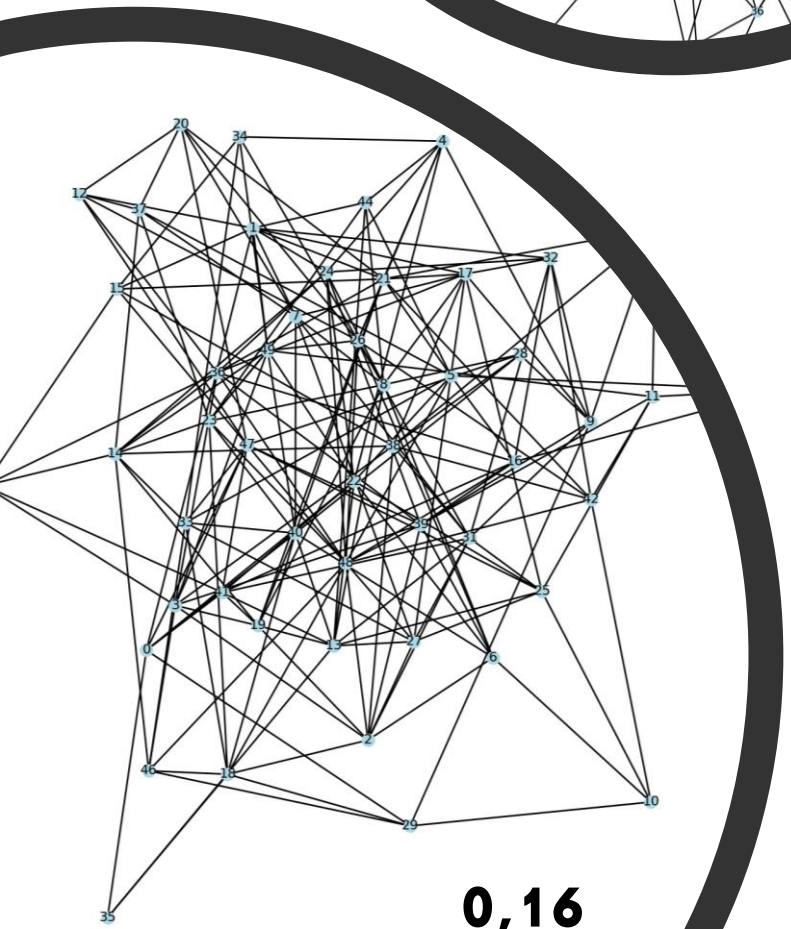

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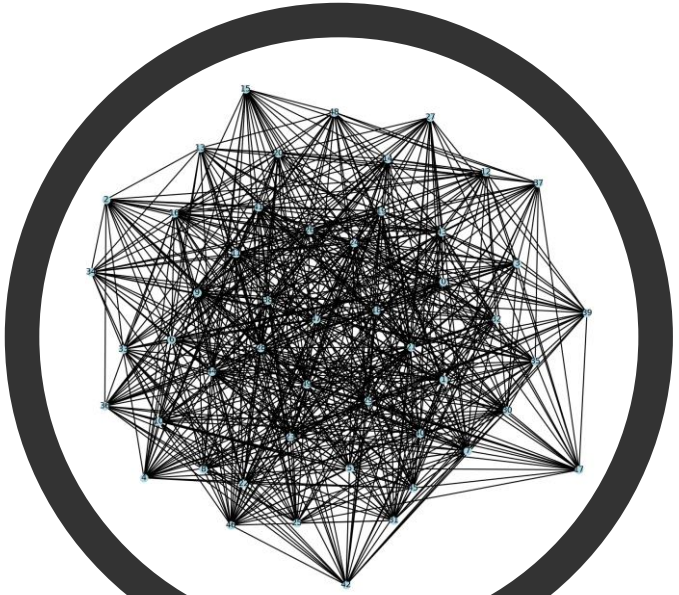

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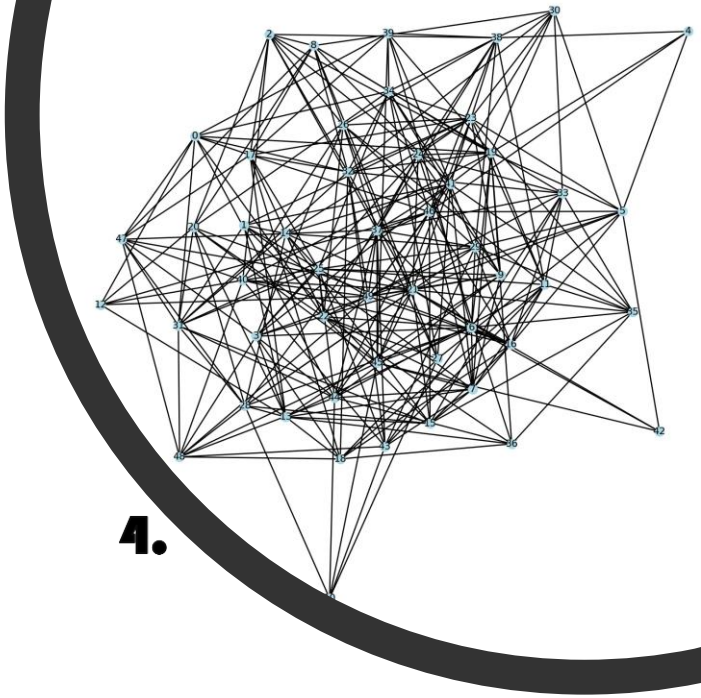

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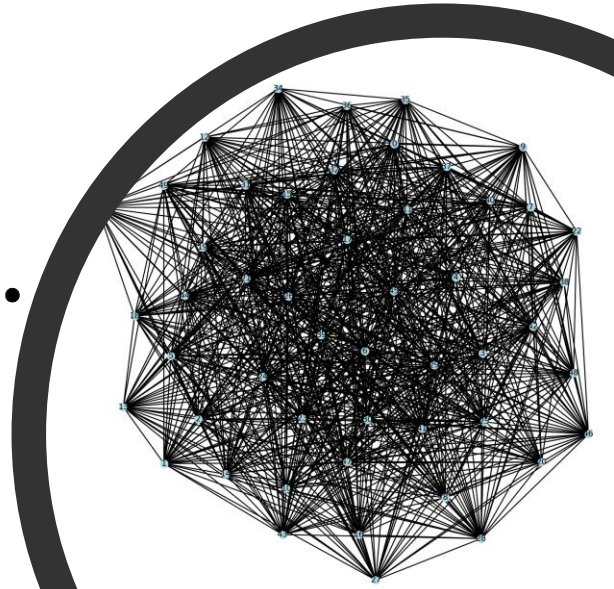

Density

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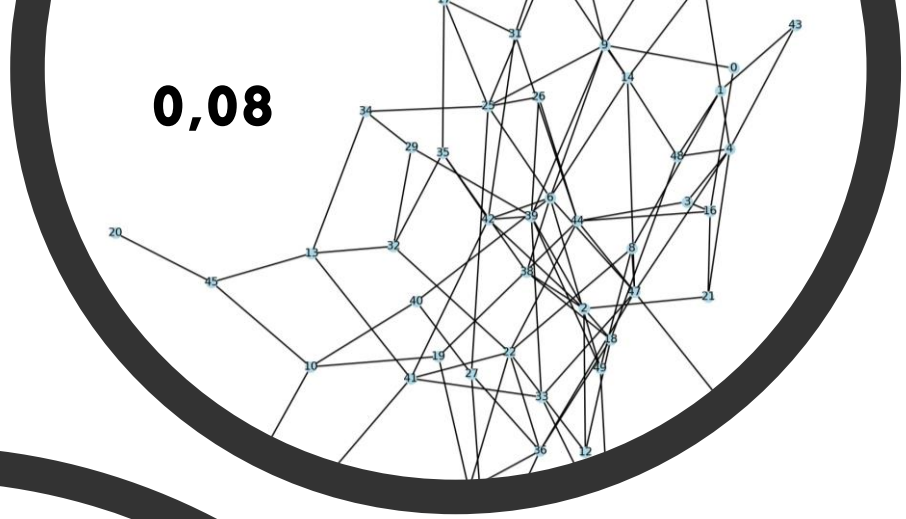

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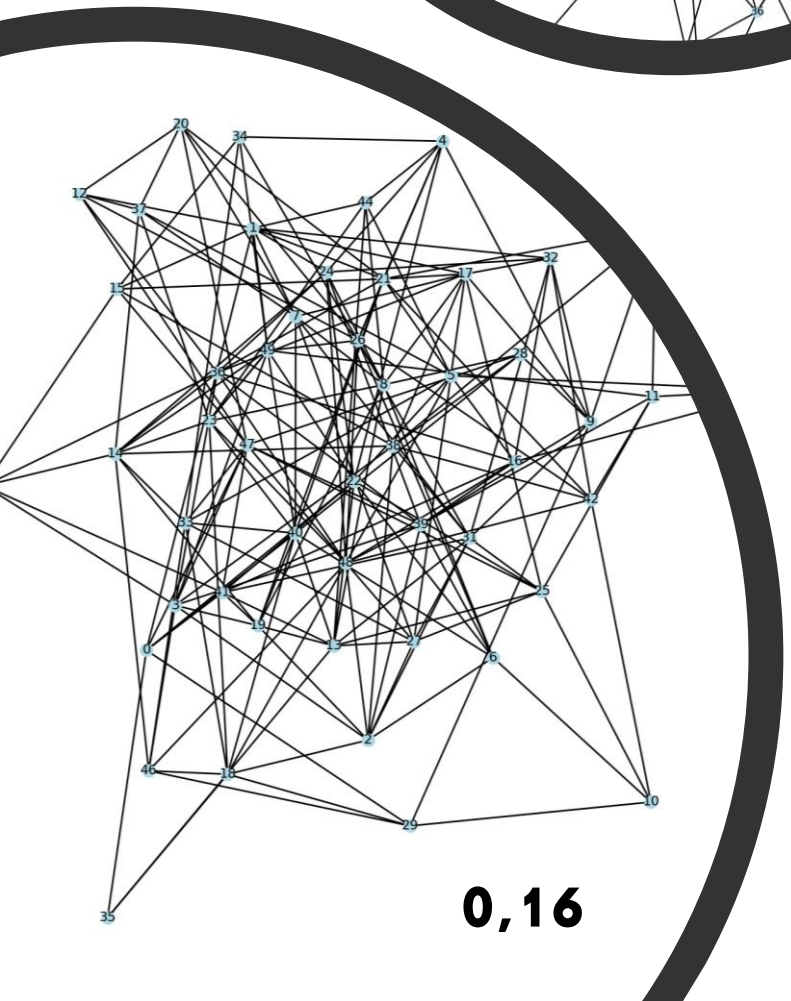

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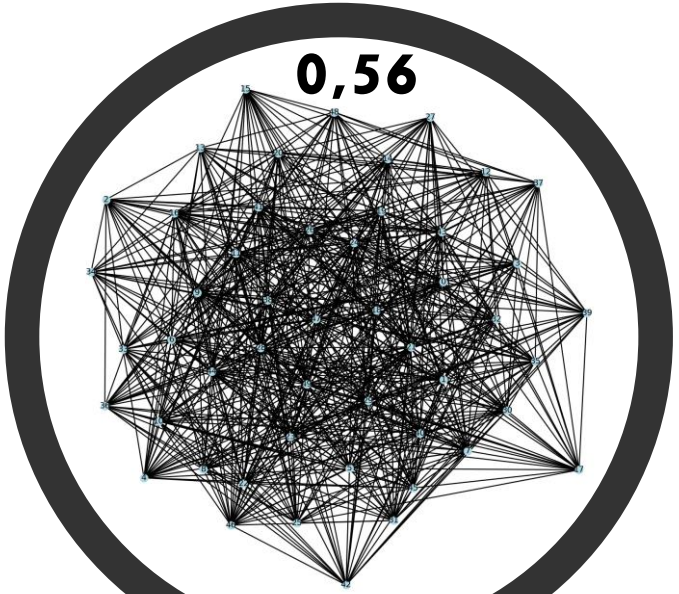

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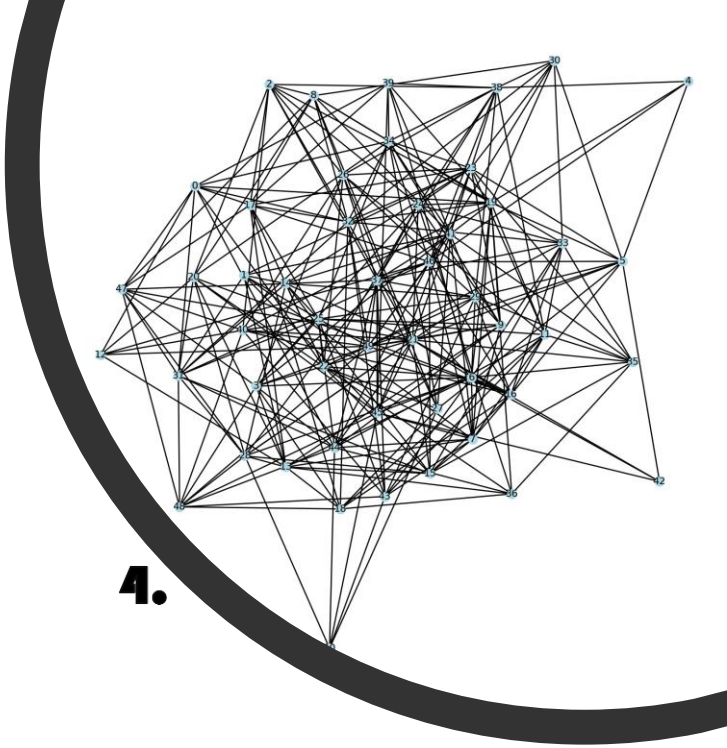

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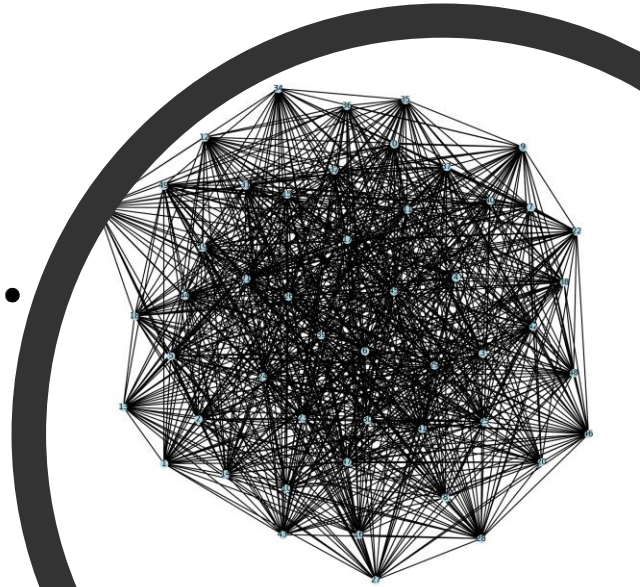

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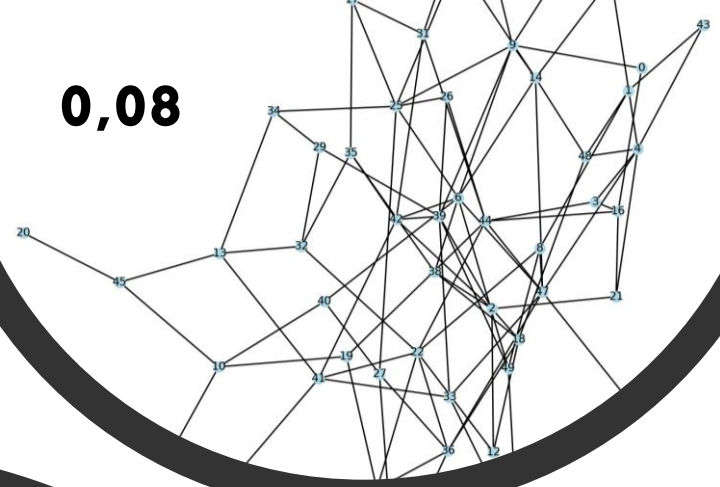

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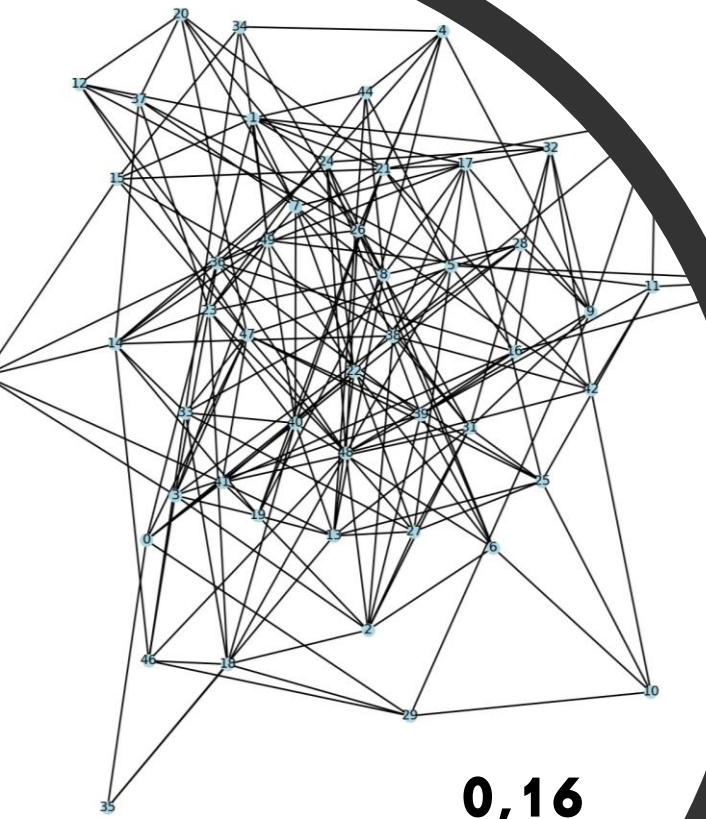

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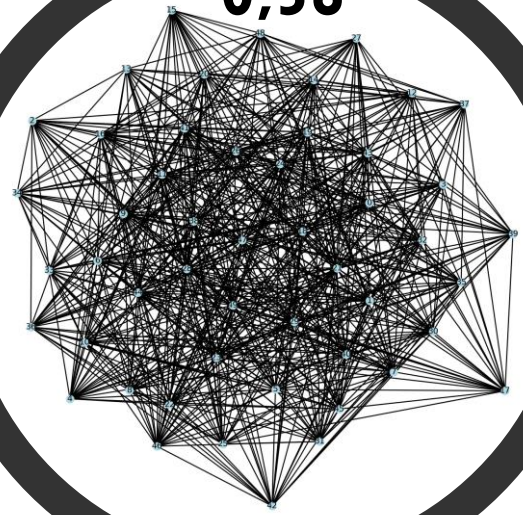

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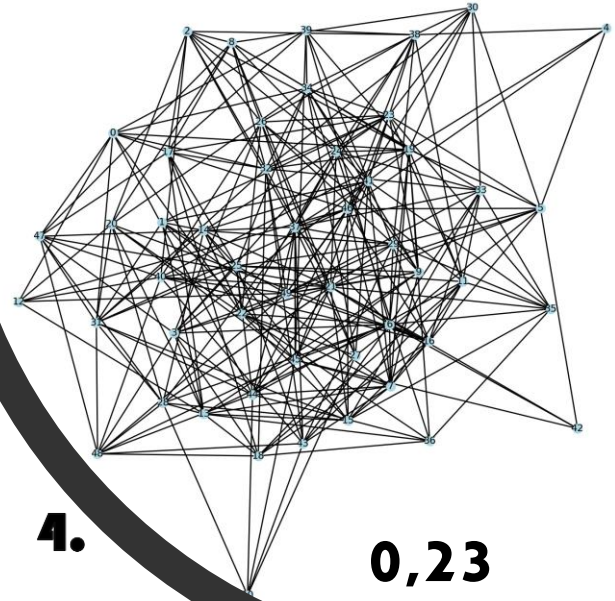

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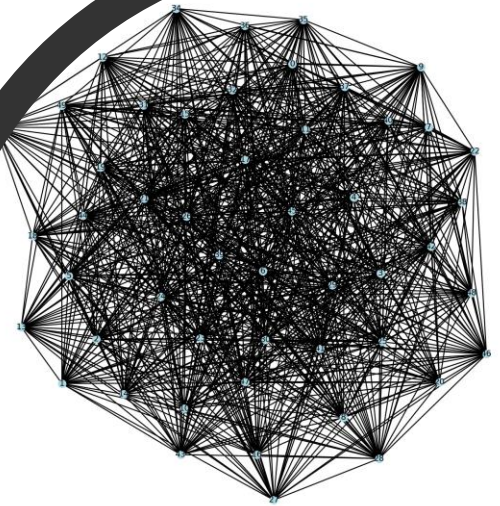

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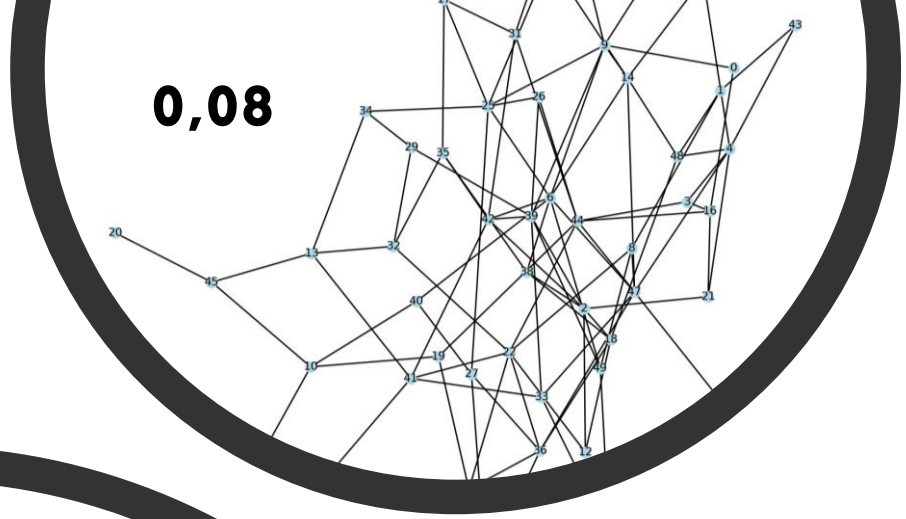

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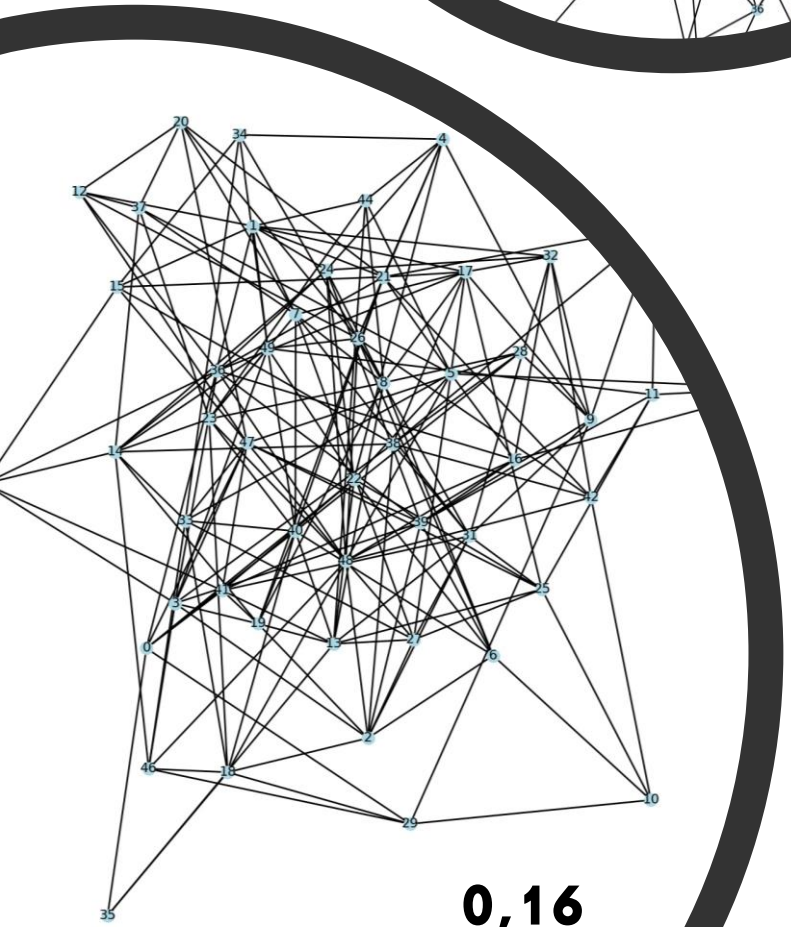

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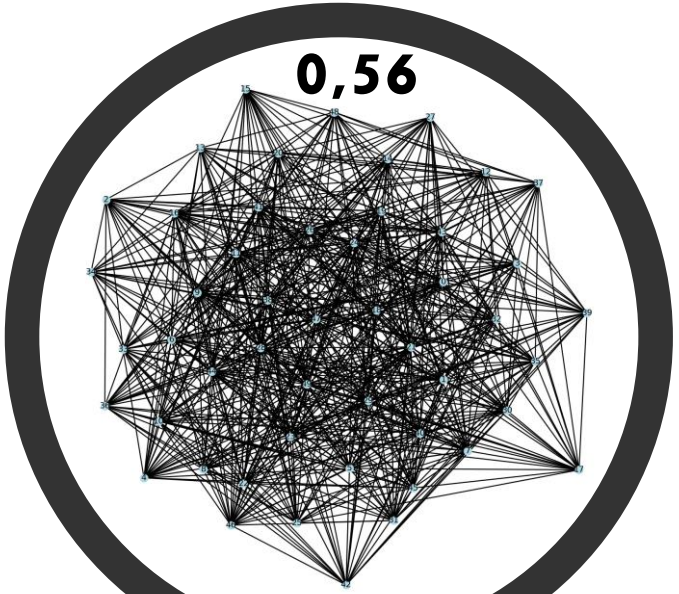

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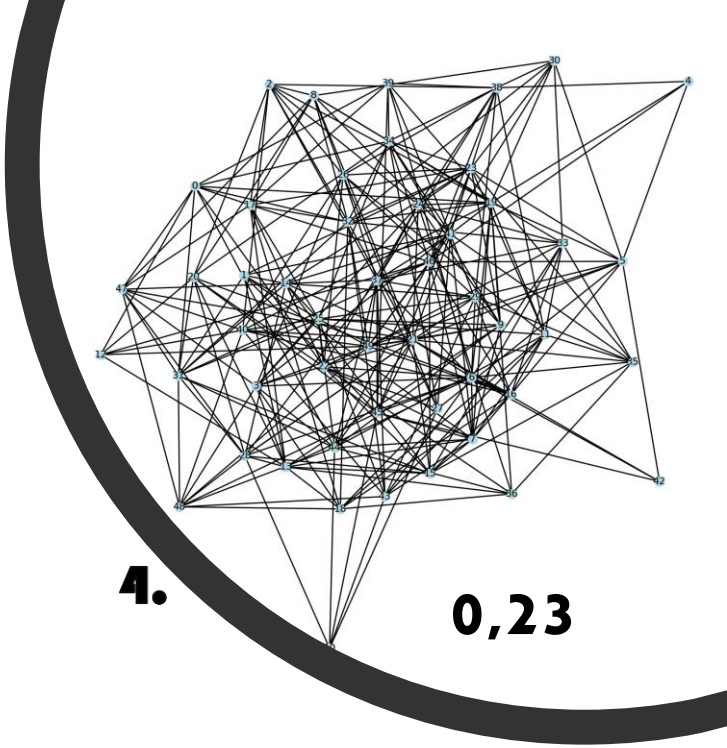

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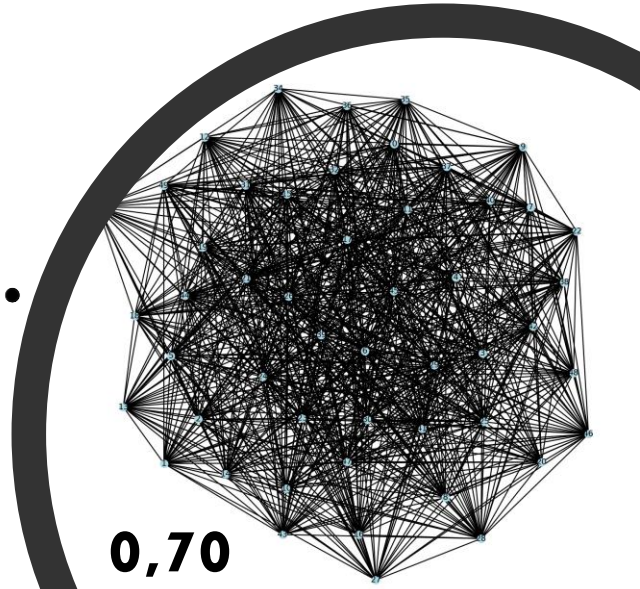

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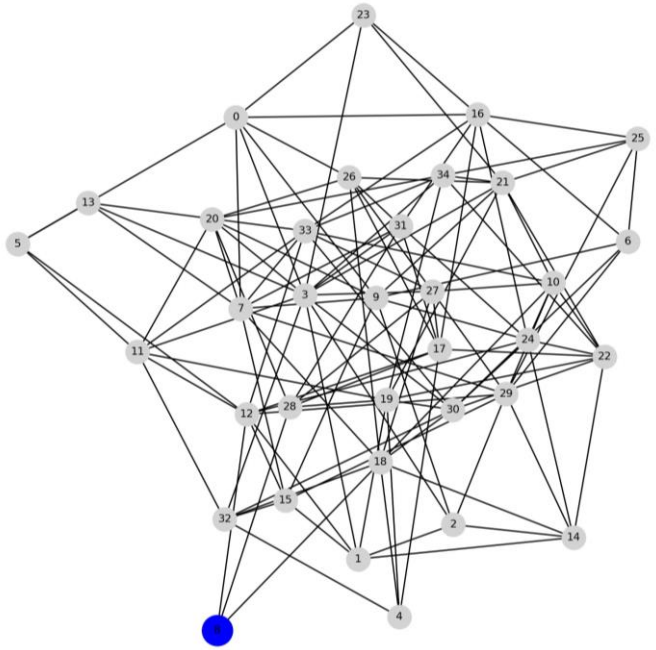

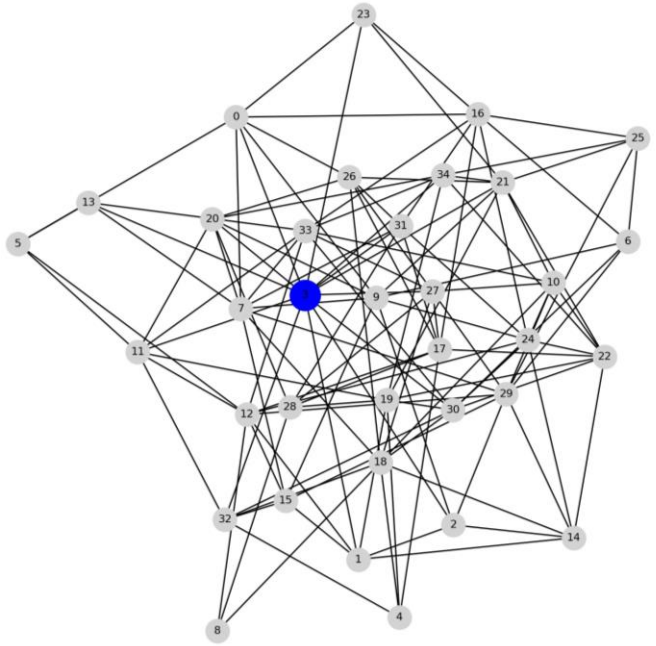

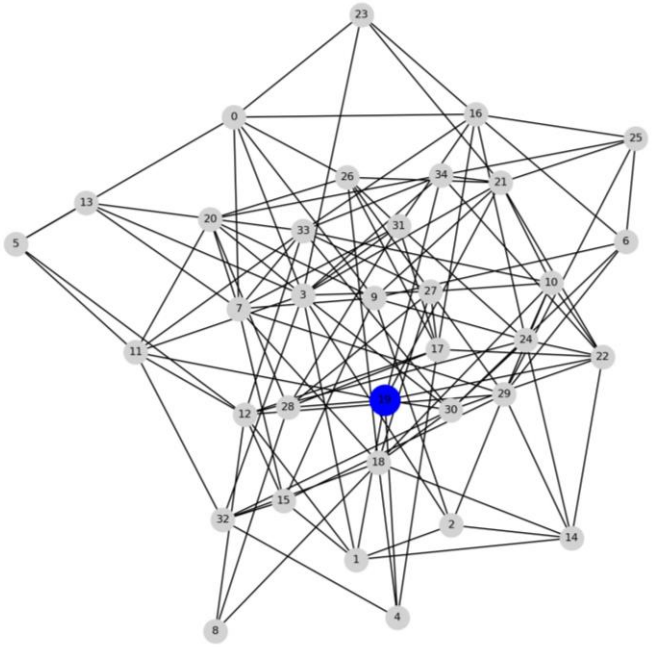

Closeness centrality

- Identifies nodes that can reach other nodes efficiently within the network.
- Quantifies how close a node is to all other nodes in the network.
- Ranges from 0 to 1 (the node is on average farther away from / closer to all other nodes in the network).

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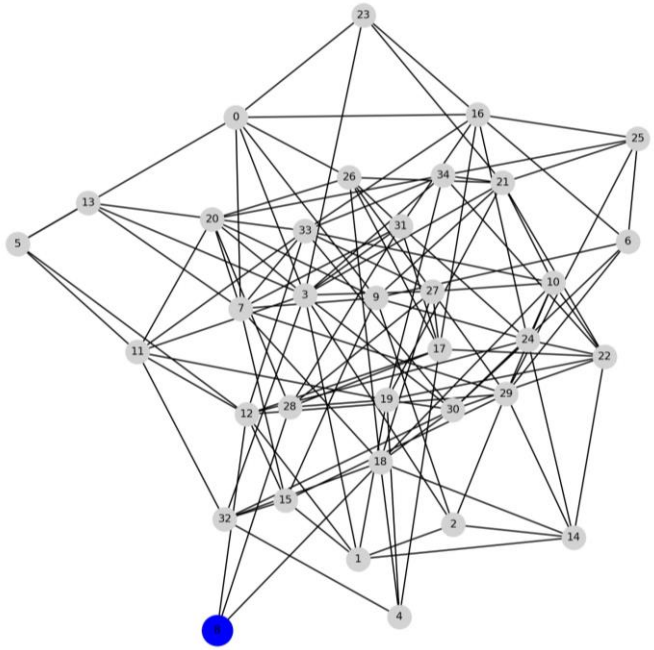

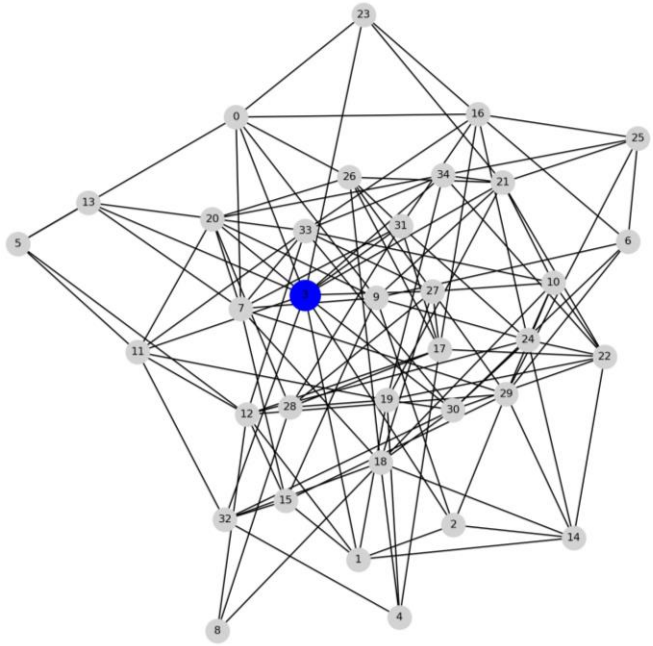

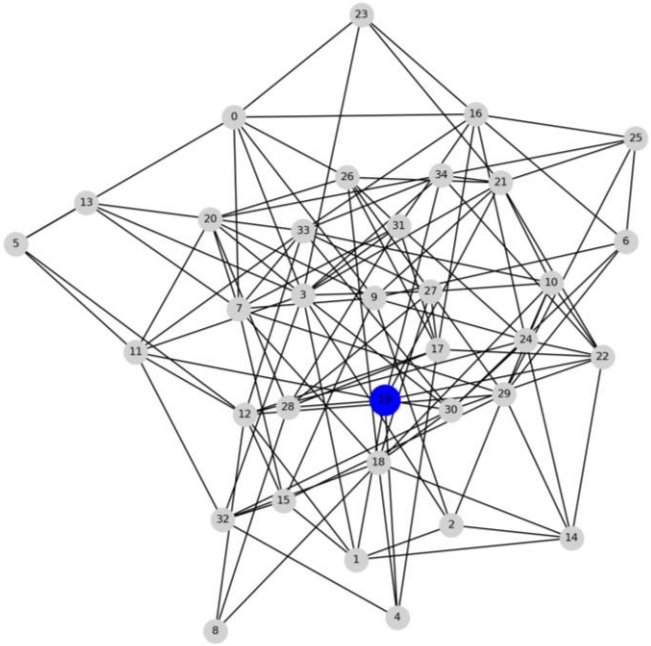

Closeness centrality

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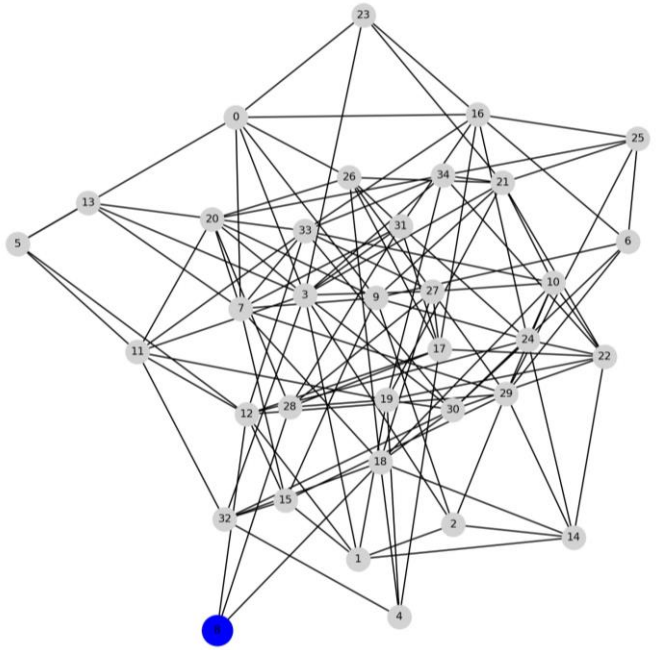

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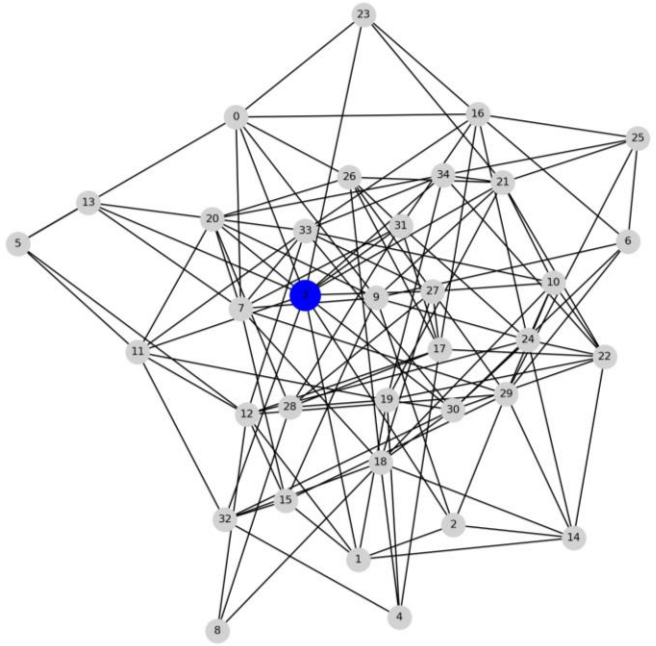

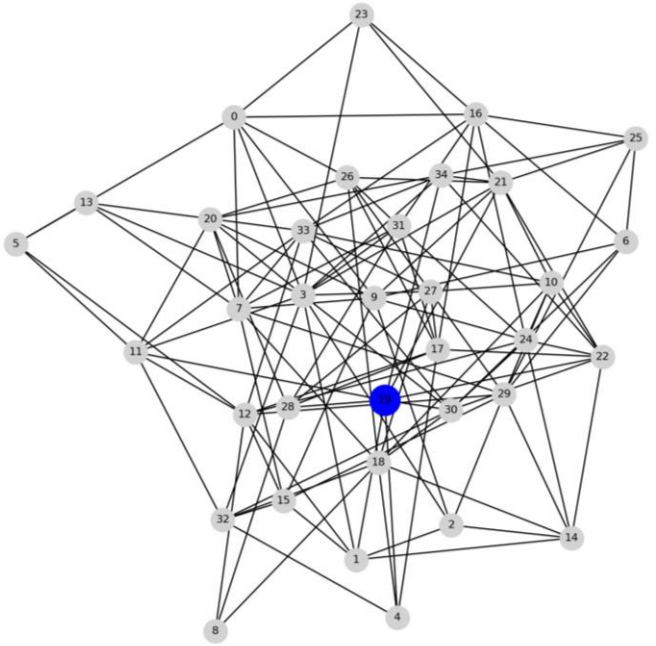

Closeness centrality

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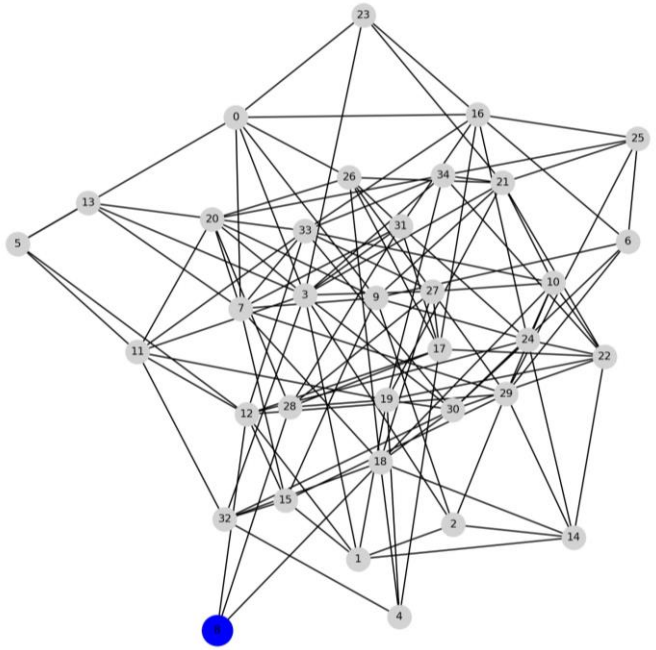

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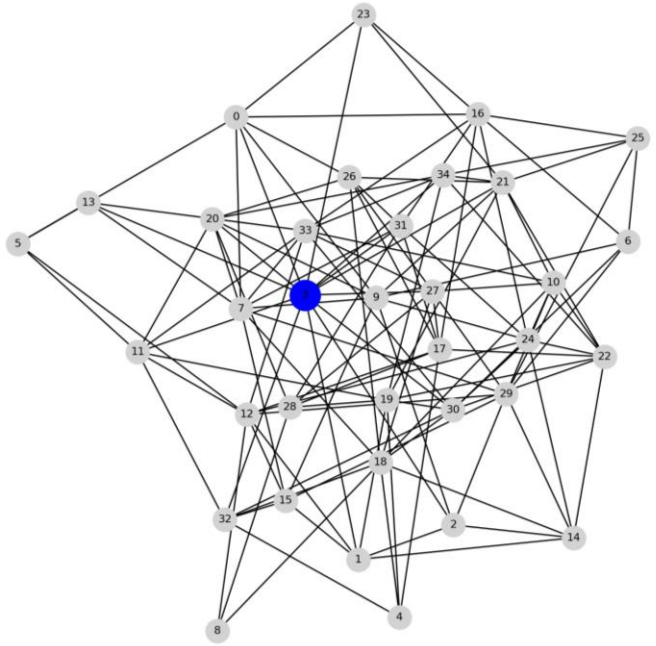

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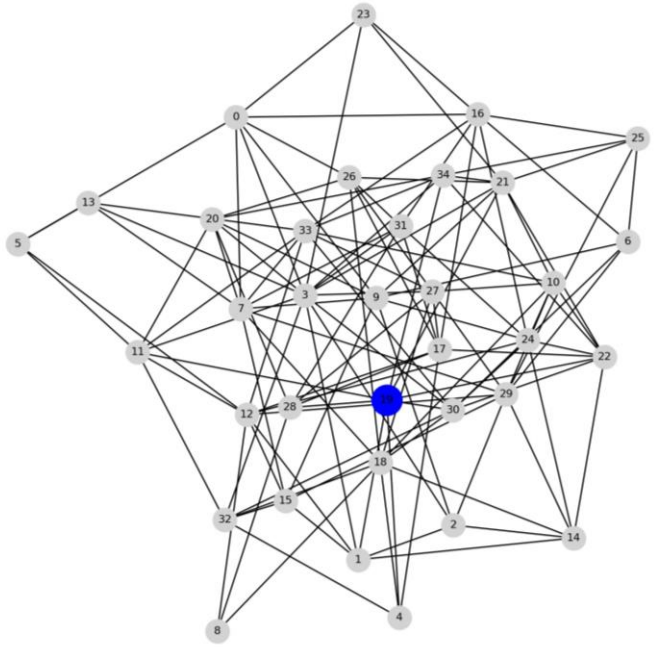


Closeness centrality

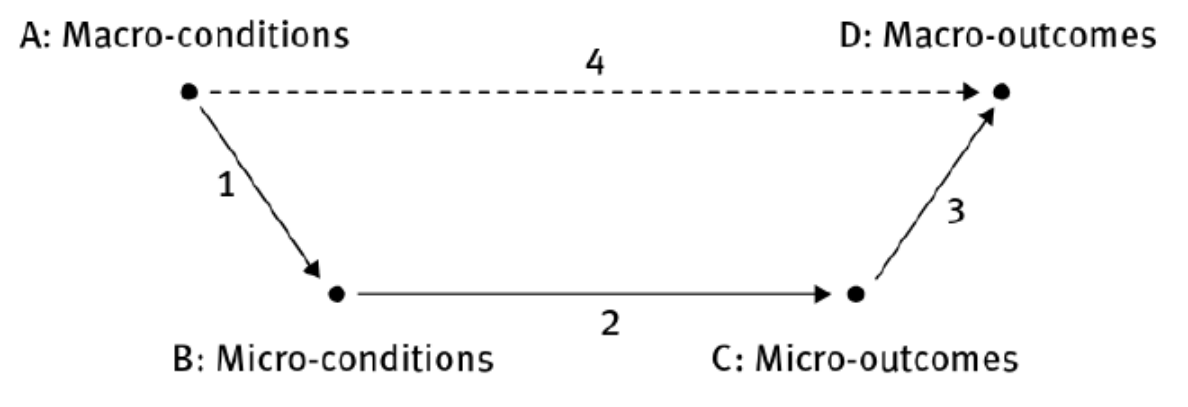
Well done!

Reading for today

Fuhse, J. A. (2020). Theories of social networks. The Oxford Handbook of Social Networks, 34-49.

Coleman boat

Macro-level



Micro-level

Coleman boat

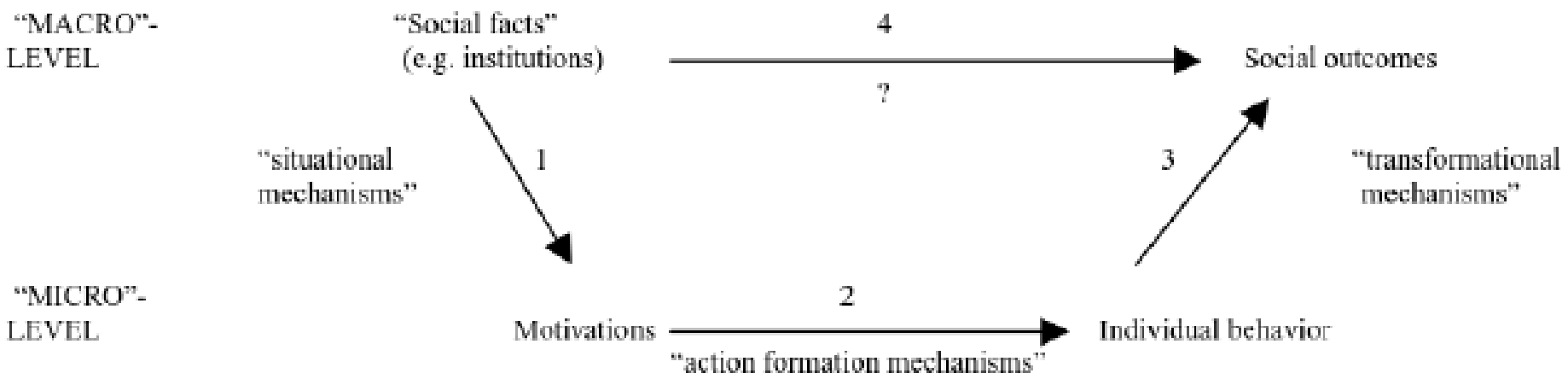


Figure 1. "Boudon-Coleman diagram."

(After Coleman [1986a, 1986b] and Hedström and Swedberg [1998]).

Pic sources: https://www.dustinstoltz.com/blog/2023/7/23/diagrams-of-theory-james-colemans-boat-bathtub/, https://www.dustinstoltz.com/blog/2023/7/23/diagrams-of-theory-james-colemans-boat-bathtub/


Questions?

Final task:
Create the best network structure for the given scenario.

1. Scenario 1: A company wants to implement a new filing protocol for its workers. The employees are reluctant to use the new system. How to best implement this innovation?

2. Scenario 2: There is a tool-sharing program within a neighborhood. How to make it effective?

3. Scenario 3: A venture capital firm is looking for new start-ups to invest into that will be ‘a real deal’. What can help them in doing it?

4. Scenario 4: There is a highly multidisciplinary research team that is working on a project. The scientists have very different backgrounds and expertise. How to enhance this collaboration?

Next session: Social Capital and Networks

- Mandatory reading:

Burt, R. S. (2017). Structural holes versus network closure as social capital. Social capital, 31-56.

- Article presentation:

*Pichler, F., & Wallace, C. (2009). Social capital and social class in Europe: The role of social networks in social stratification. European Sociological Review, 25(3), 319-332.

See you next week!