AI Talent Hub

ИТМО

Social Network Analysis Project

Kabanov A. G.

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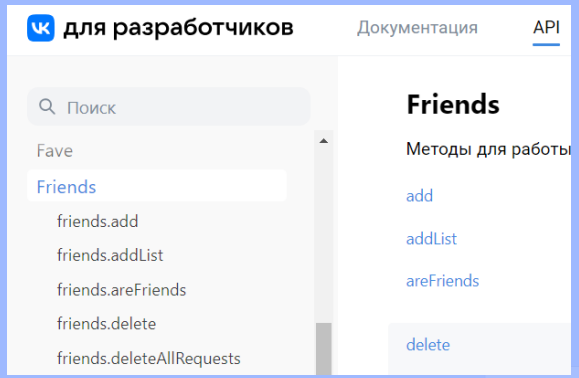
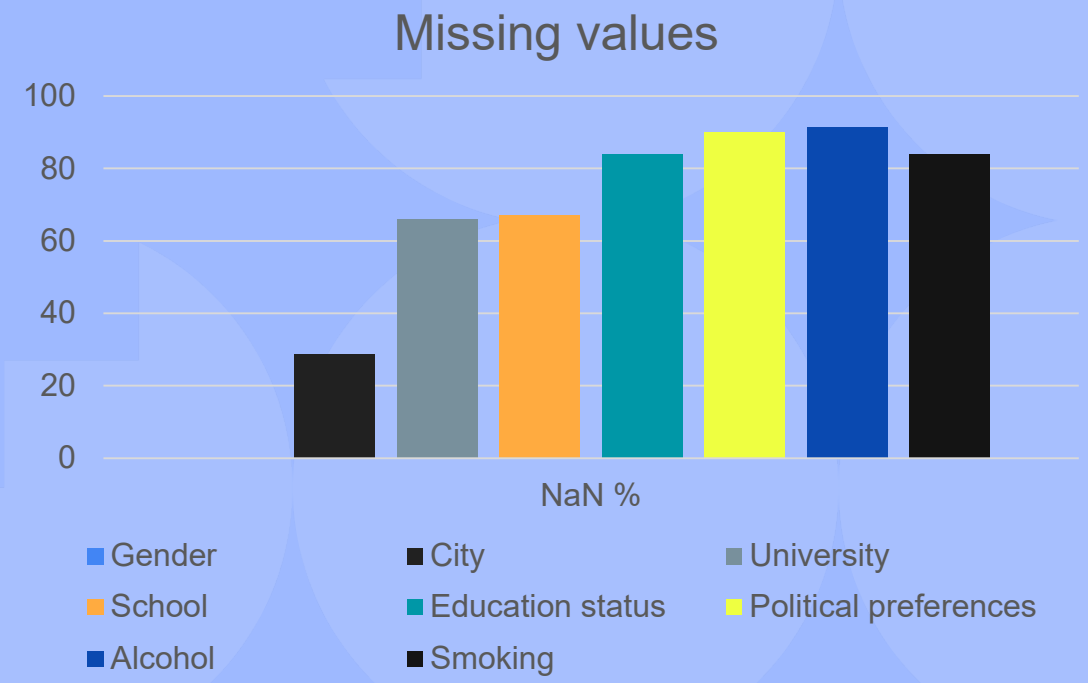
Data collection



VK API



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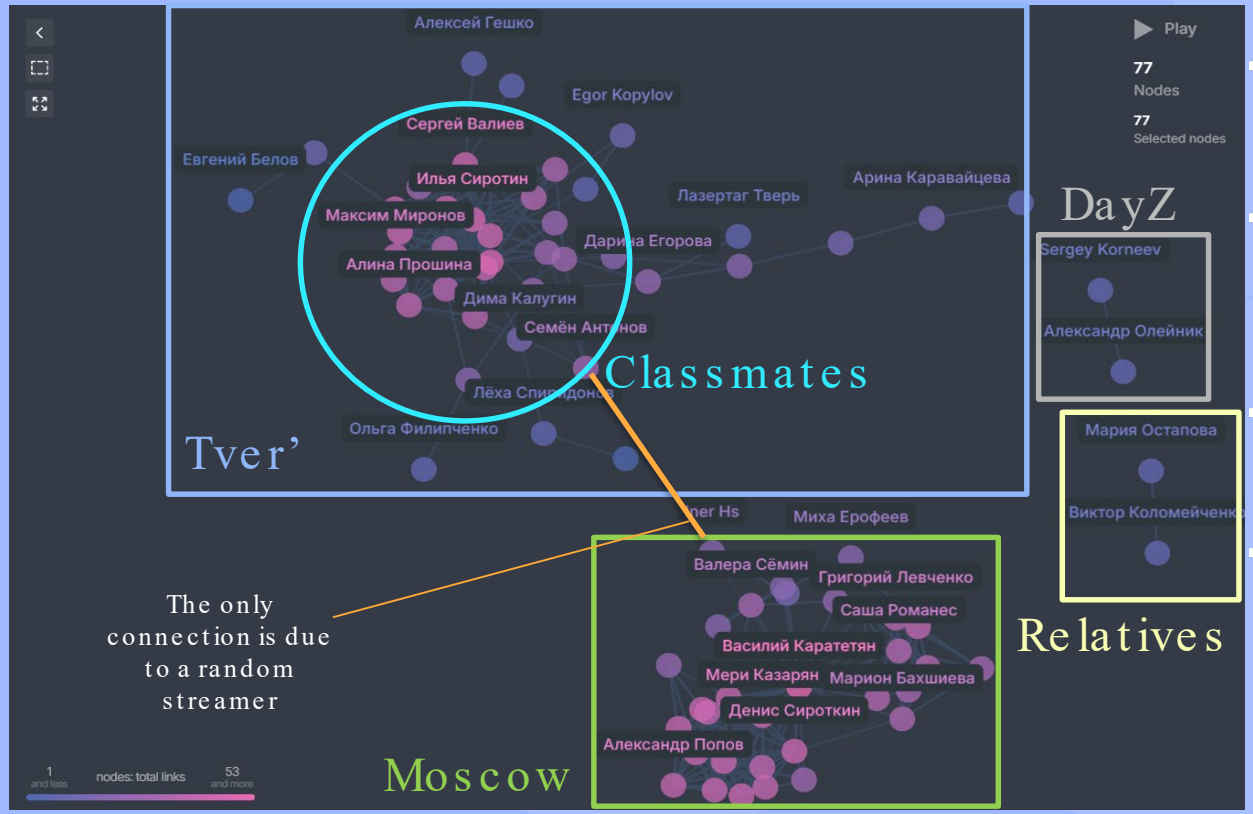
Summary



- Total friends: 98 (4 are inactive)
- Show on graph: 77 (the rest don't have connections)
- Largest connected component size - 73
- The graph is undirected, homogeneous, unweighted

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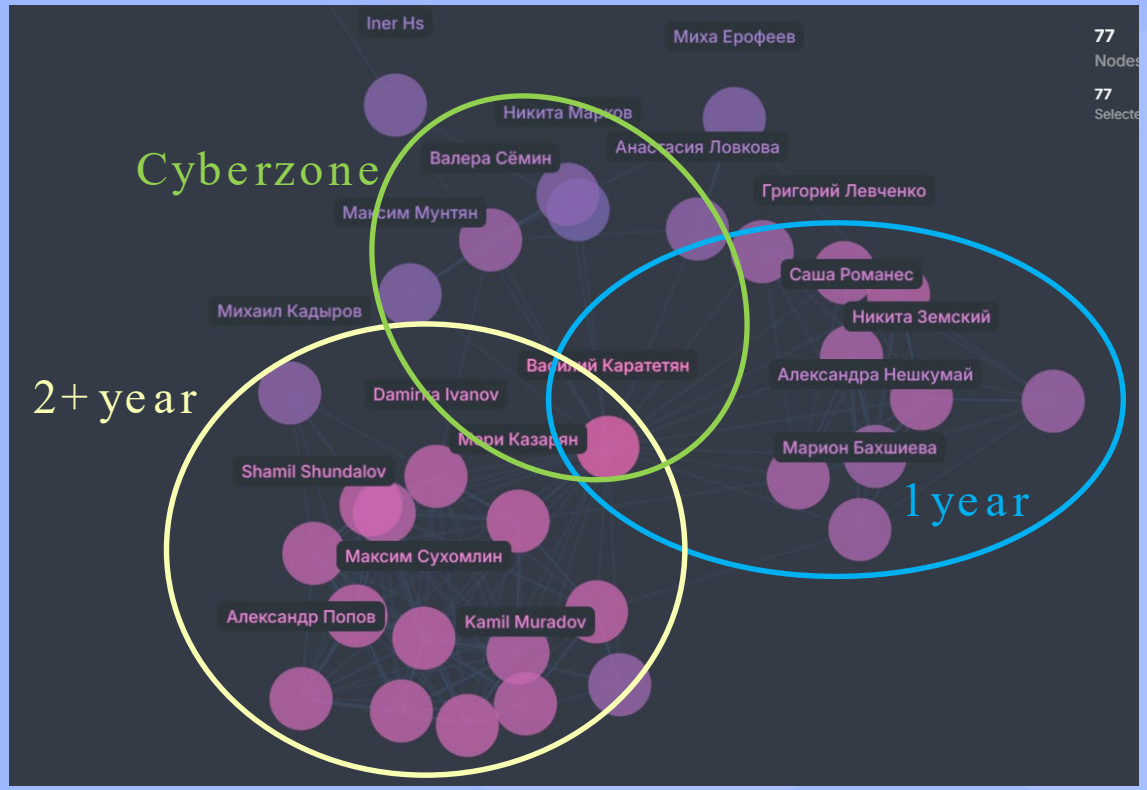
Summary



The largest connected components statistics

- Nodes – 73
- Edges – 283
- Diameter – 10
- Radius – 5

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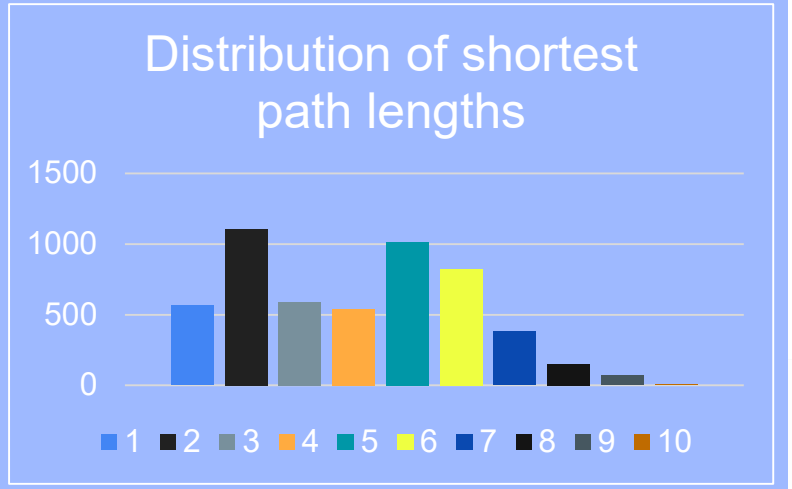
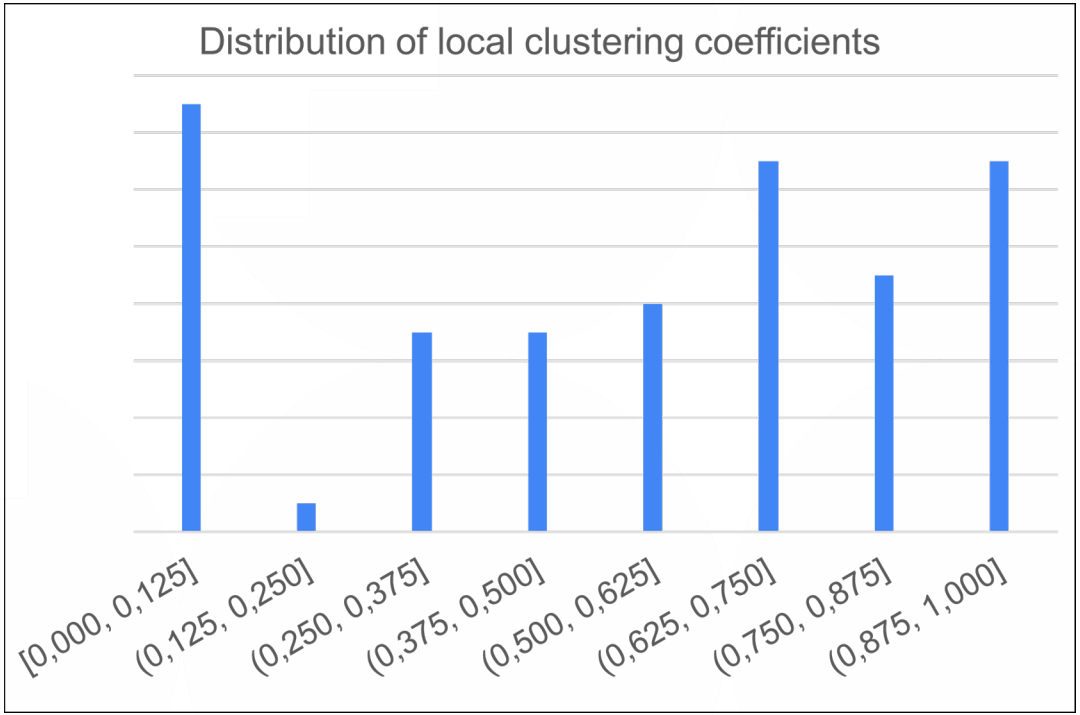
Summary



Average shortest path length: 4.06



Transitivity: 0.63

Average local clustering coefficient: 0.537

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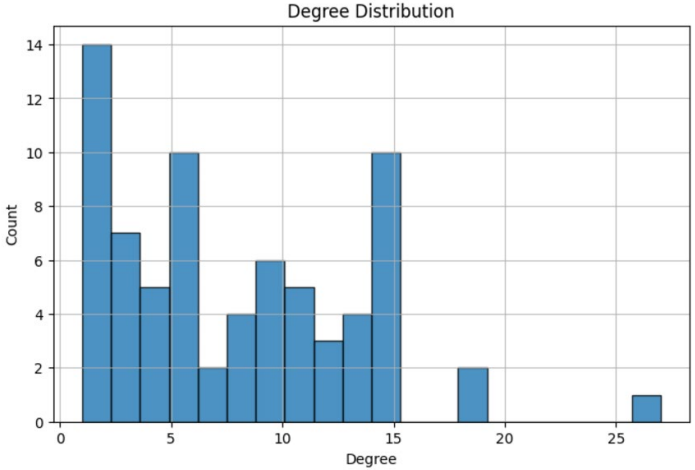
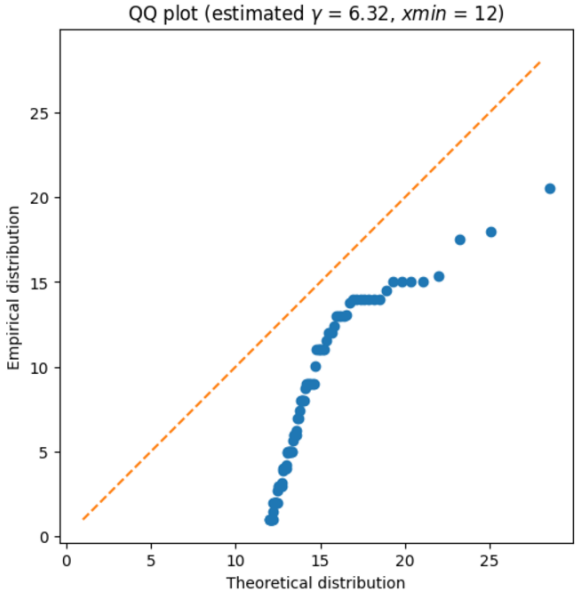
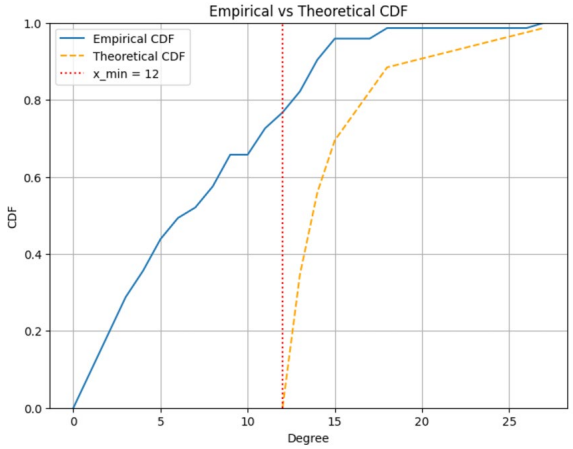
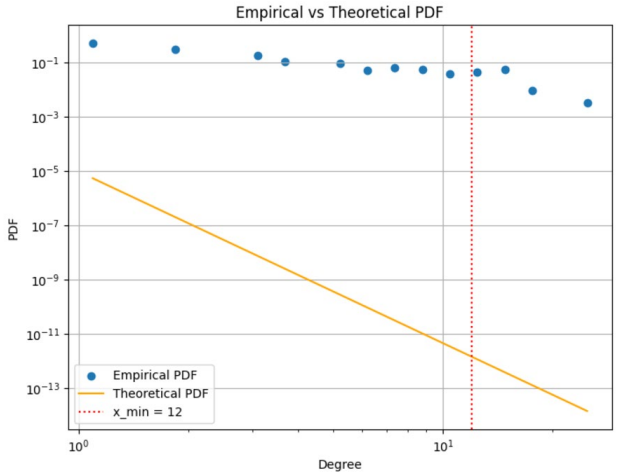
Power law









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Random graphs

$N - number\ of\ nodes, K$
$- number\ of\ edges (in\ the\ original\ graph)$

Erdős-Rényi: $n = N, p = \frac{2K}{n(n-1)}$
Barabasi-Albert: $n = N, m = K\ div\ N$
Watts-Strogatz: $n = N, k = \frac{2K}{N}, p_{rewire} = 0.1$

Metric	Original	ER	BA	WS
Radius	5	3	3	5
Diameter	10	4	4	8
Transitivity	0.63	0.11	0.13	0.49
Avg local clustering coefficient	0.54	0.10	0.17	0.53
Avg shortest path length	4.06	2.3	2.49	3.86

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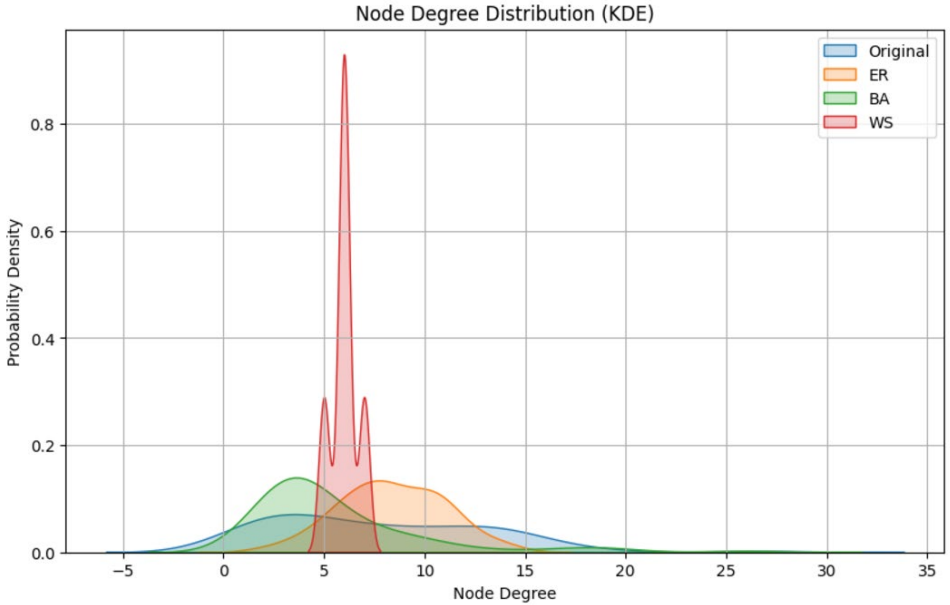
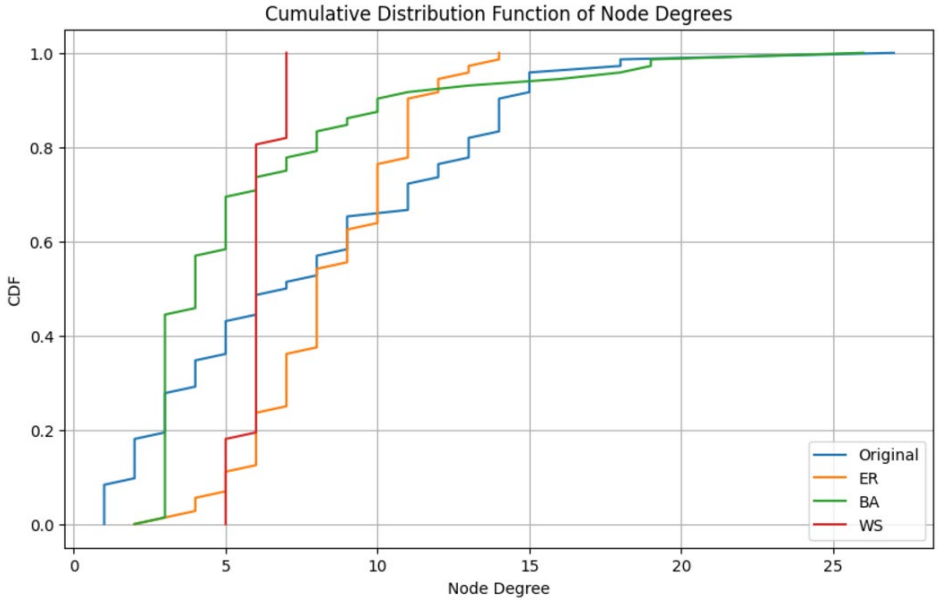
Random graphs





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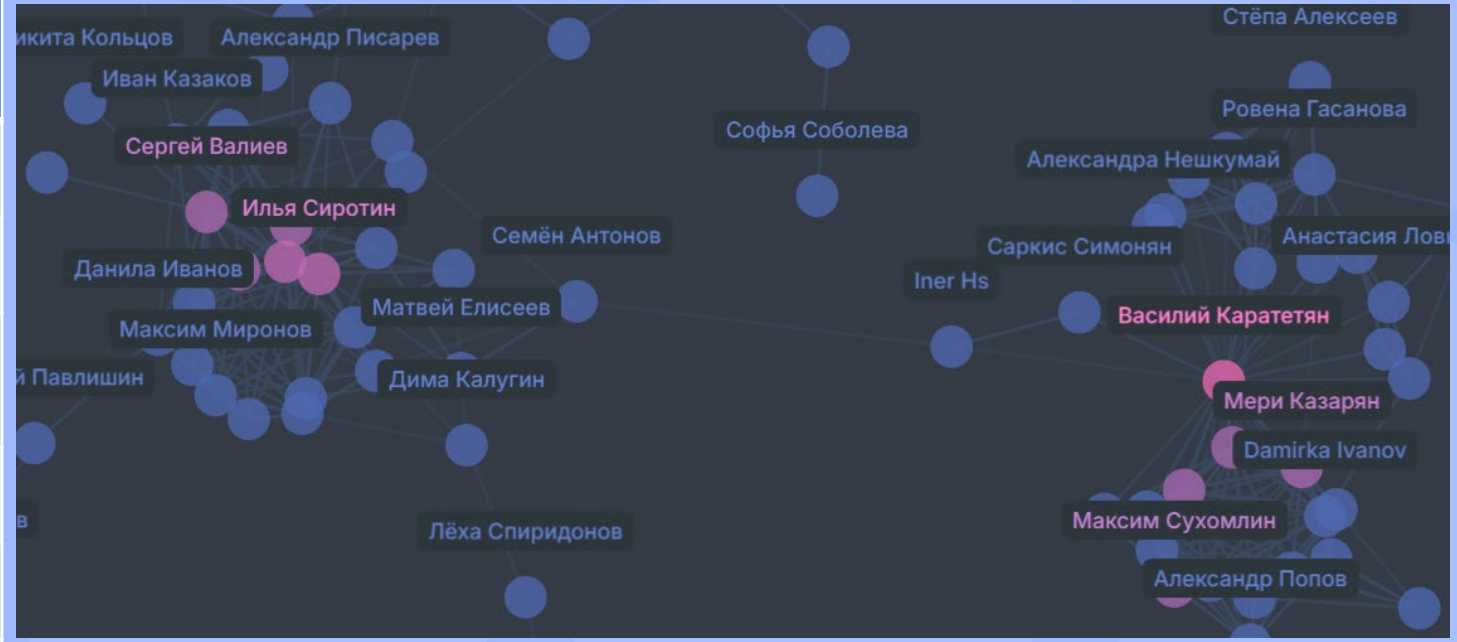
Degree centrality

Name	Degree centrality value
Василий Каратетян	0.375
Илья Сиротин	0.250
Аня Мгебришвили	0.250
Дарья Иутина	0.208
Артем Якуба	0.208
Мери Казарян	0.208

Top 10 nodes are highlighted



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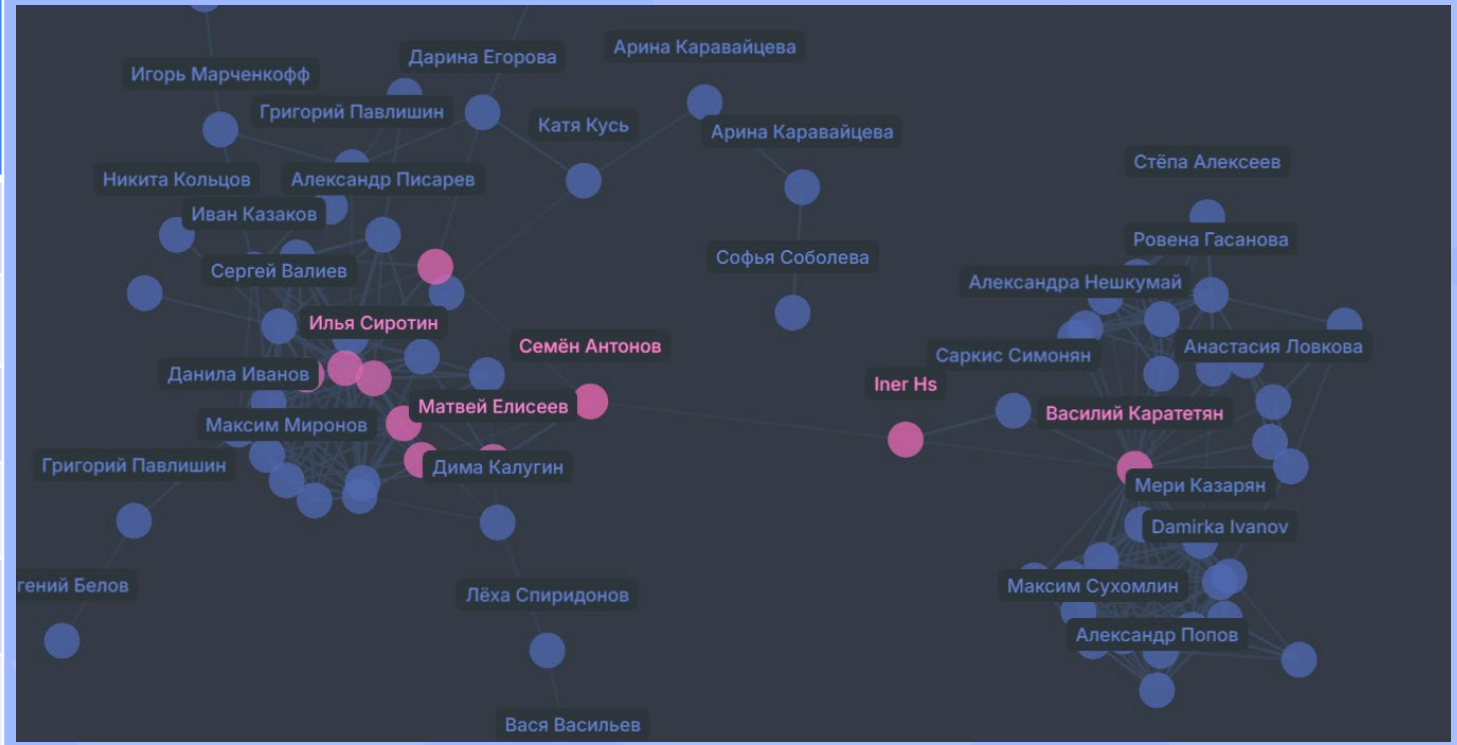
Closeness centrality

Top 10 nodes are highlighted

Name	Closeness centrality value
Семён Антонов	0.353
Iner Hs	0.338
Эльвин Гасанов	0.327
Горислав Егоров	0.323
Denis Antonov	0.320
Василий Каратетян	0.320



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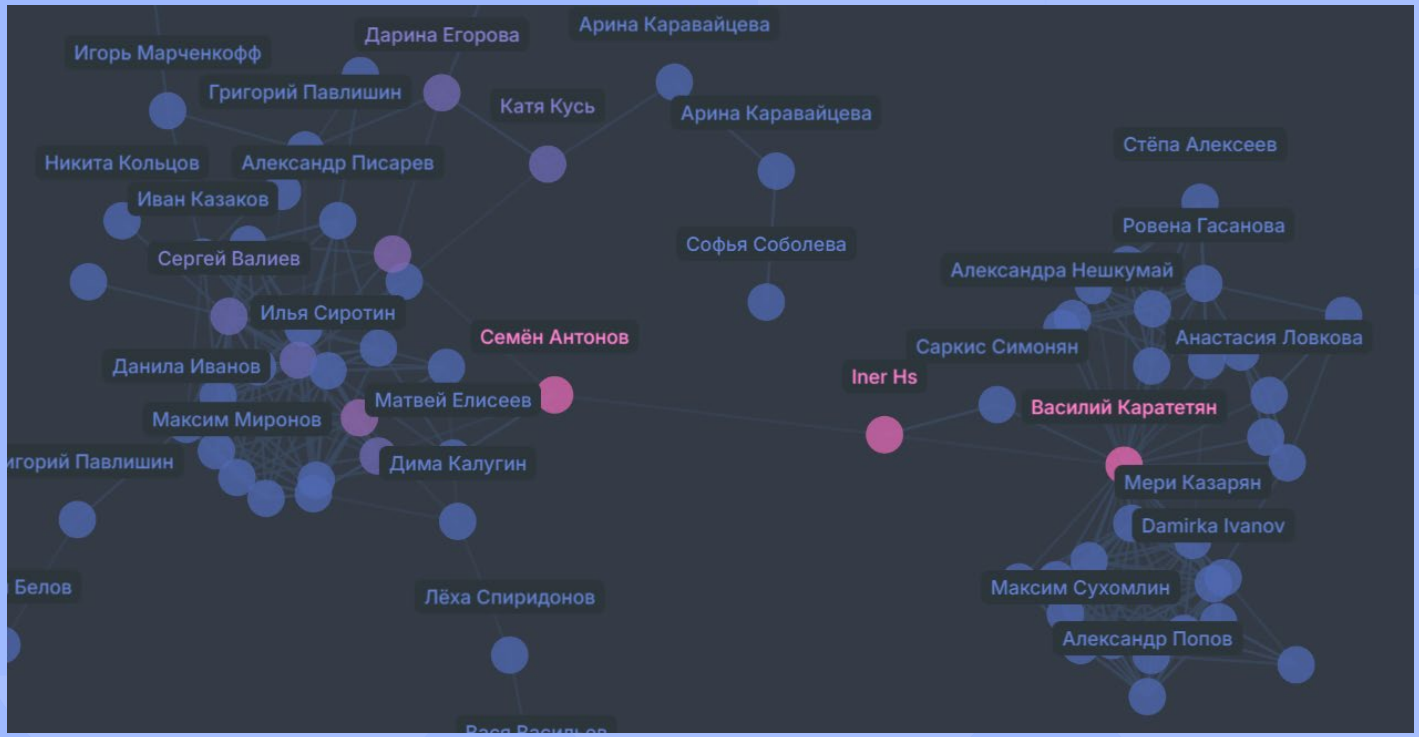
Betweenness centrality

Name	Betweenness centrality value
Василий Каратетян	0.566
Семён Антонов	0.504
Iner Hs	0.497
Эльвин Гасанов	0.221
Горислав Егоров	0.162
Дарина Егорова	0.099

Top 10 nodes are highlighted



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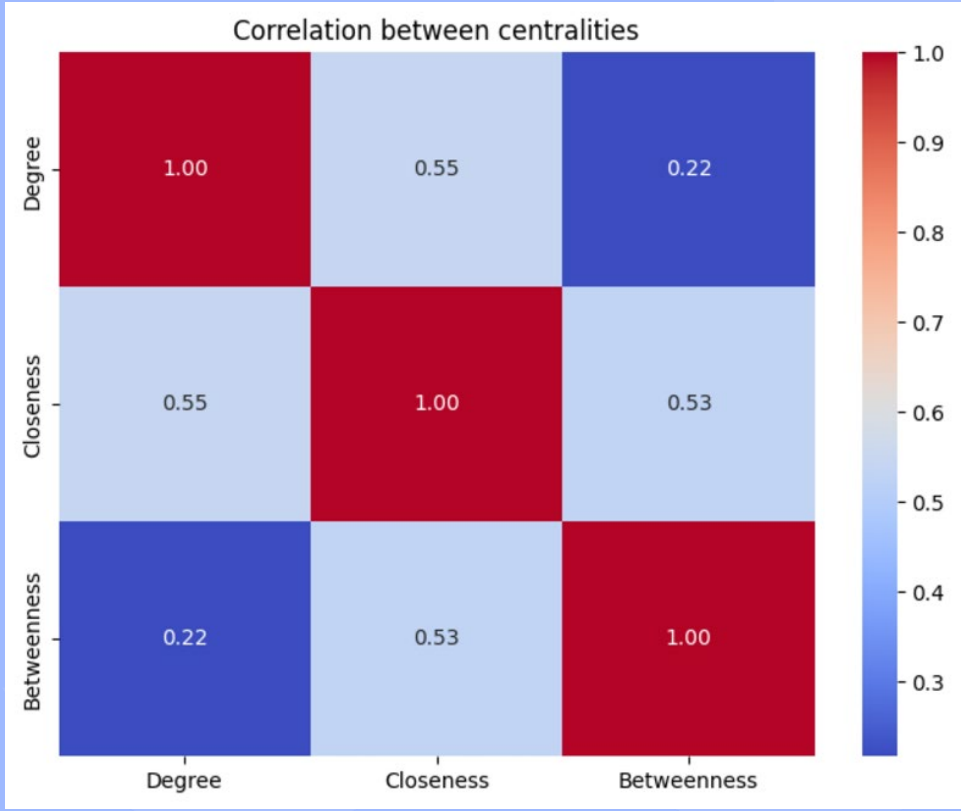
Correlation between centralities



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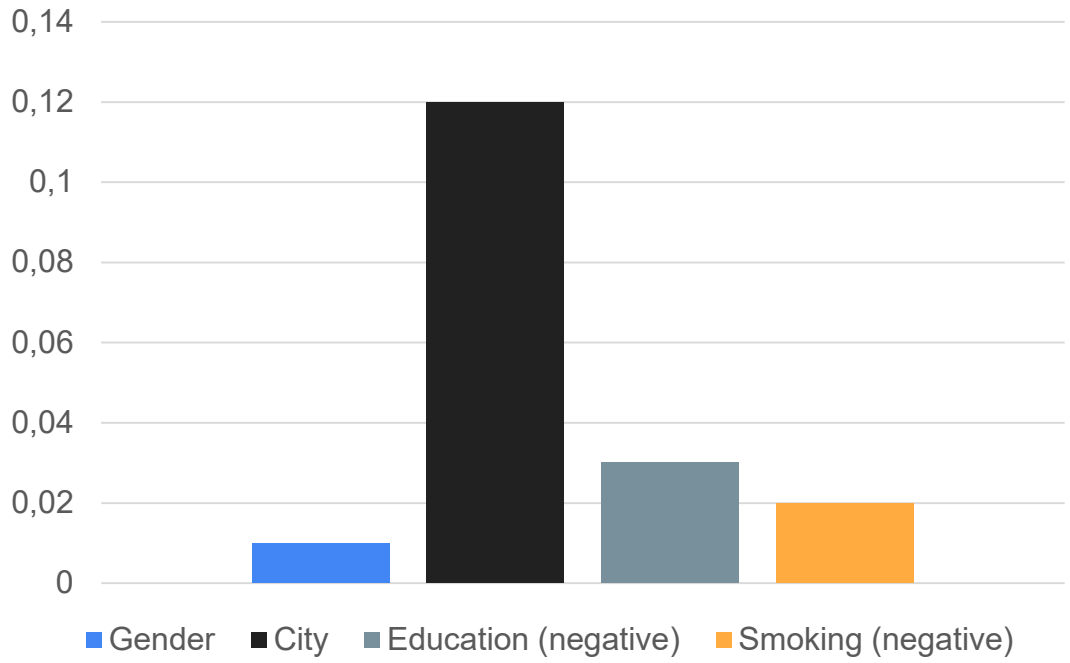
Assortativity



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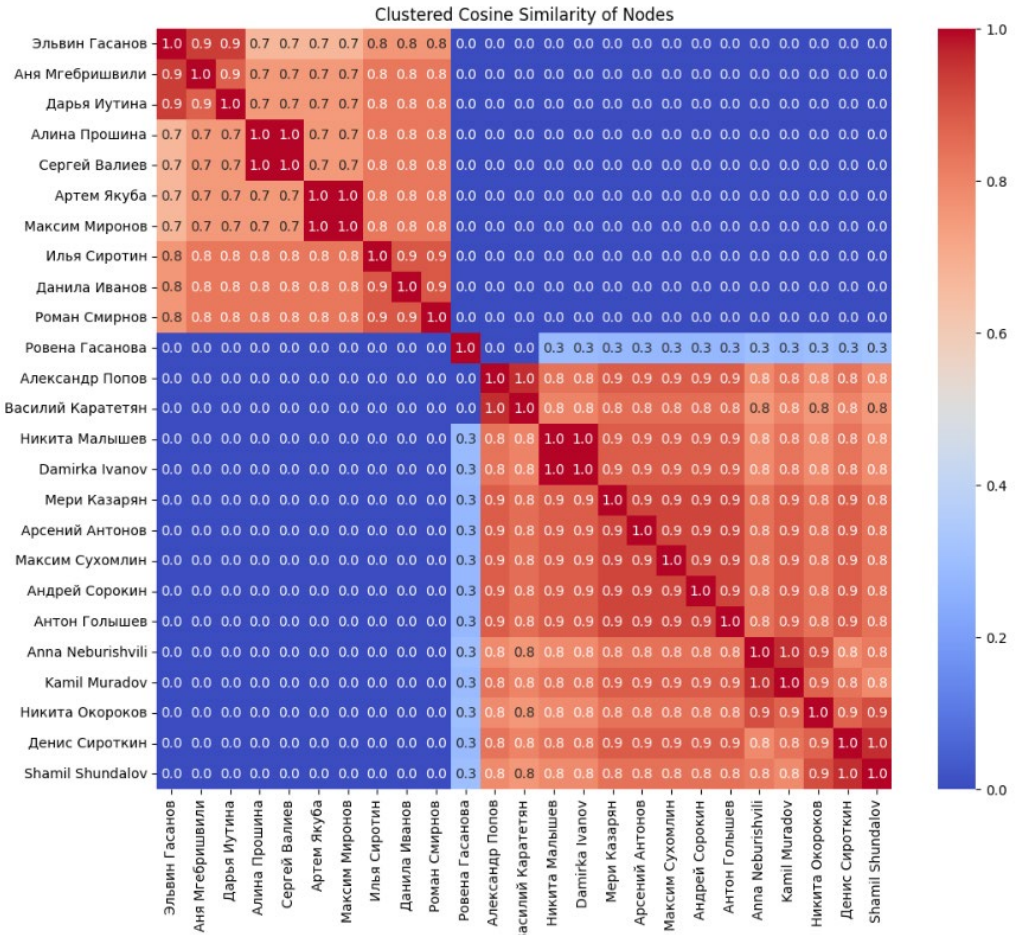
Node similarity

Only nodes with degree > 10 are left

- Cosine similarity on adjacency matrix
- Hierarchical clustering



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Largest cliques

4 similar largest cliques with size = 10

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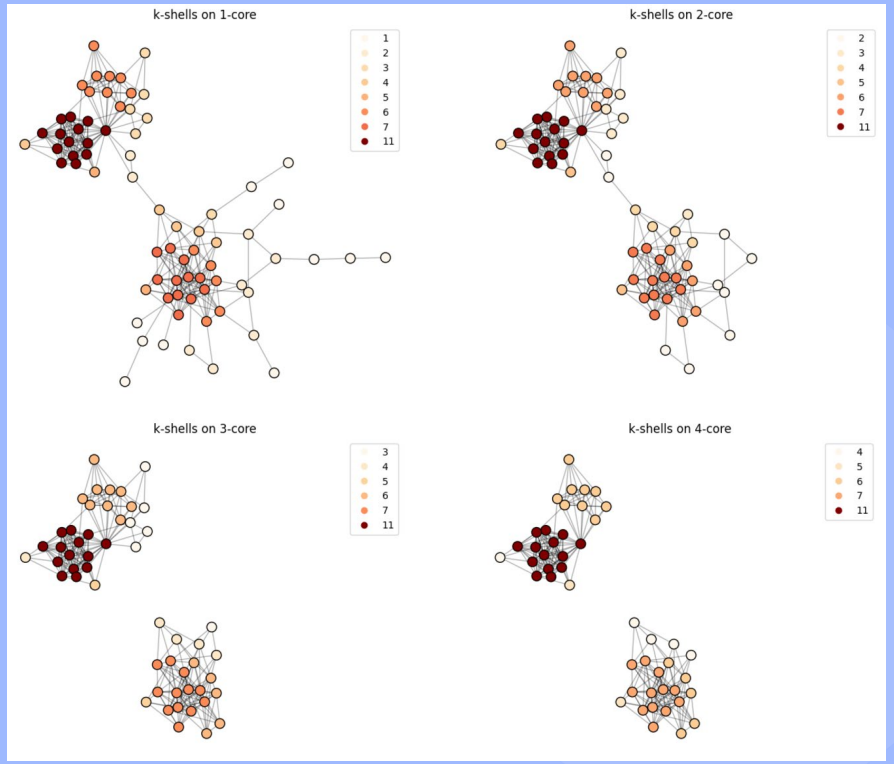
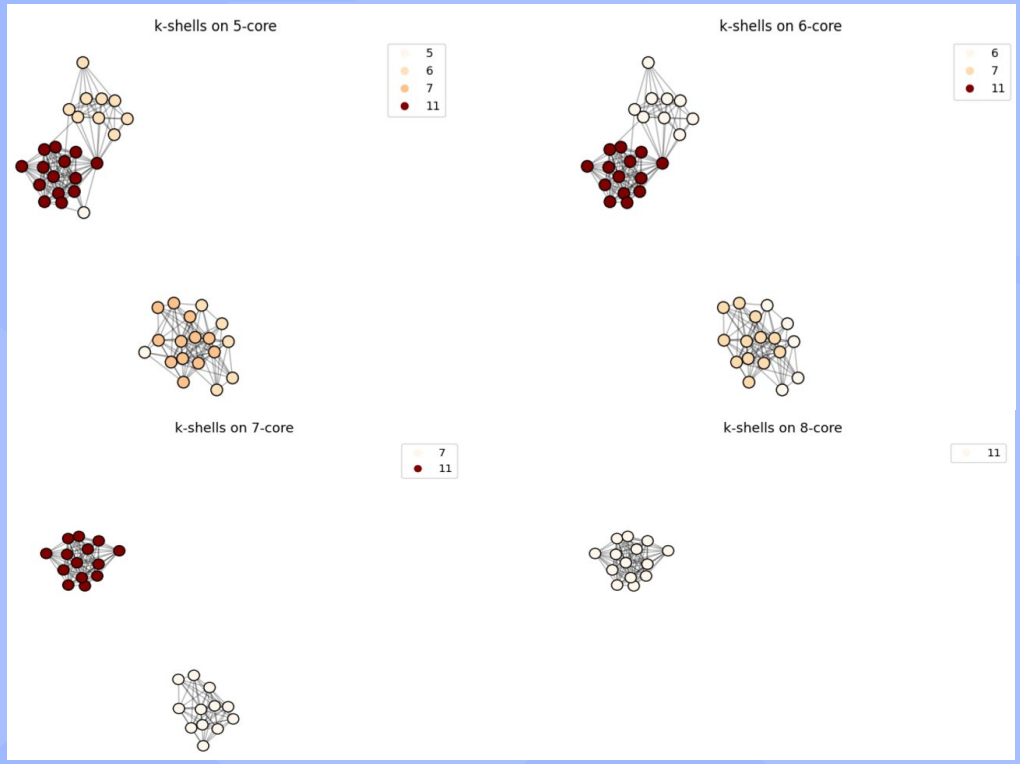
K-cores decomposition





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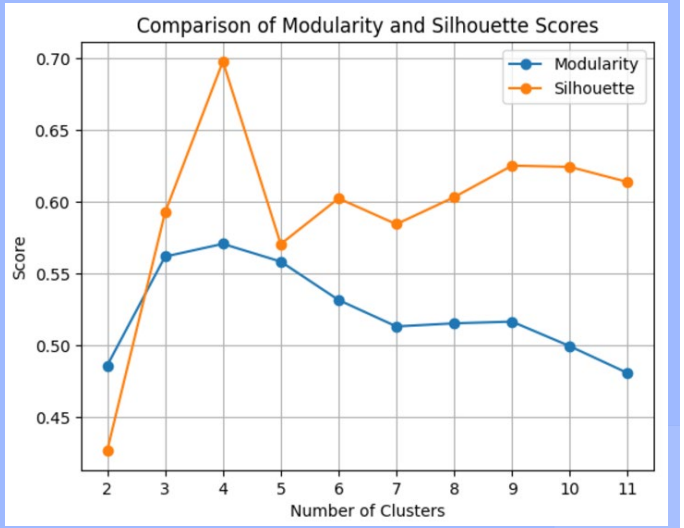
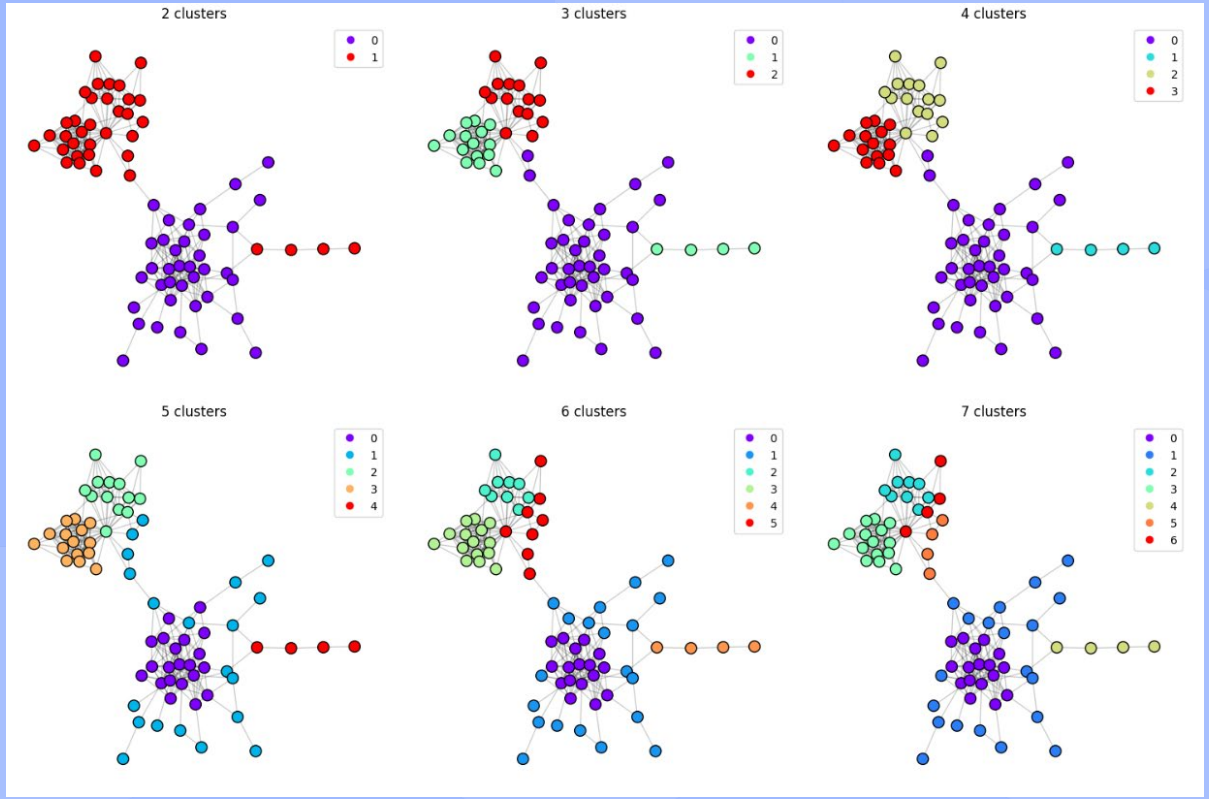
Laplacian eigenmaps + K-means





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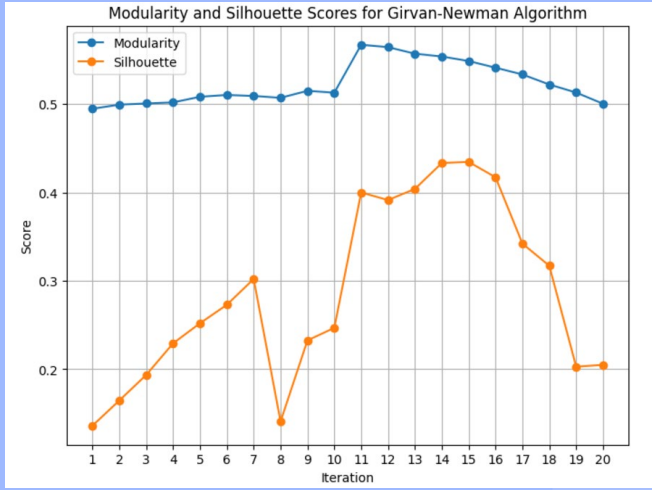
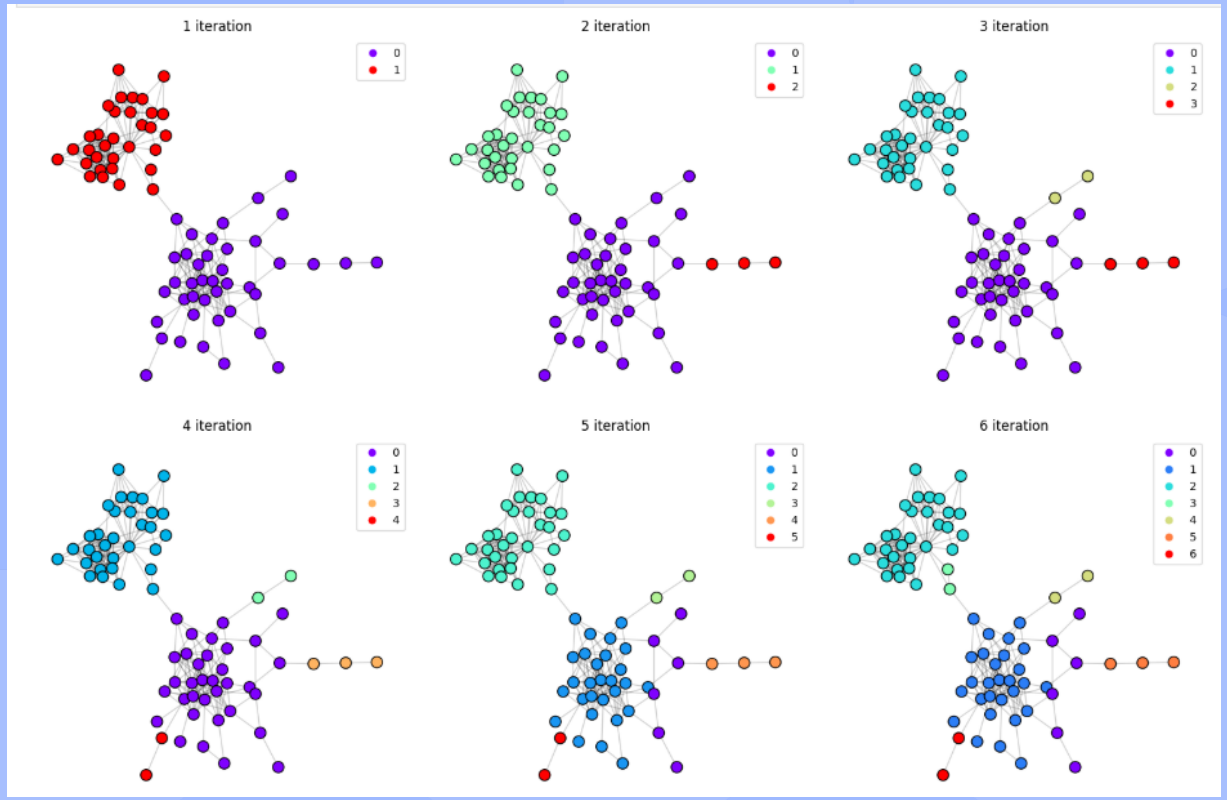
Girvan-Newman





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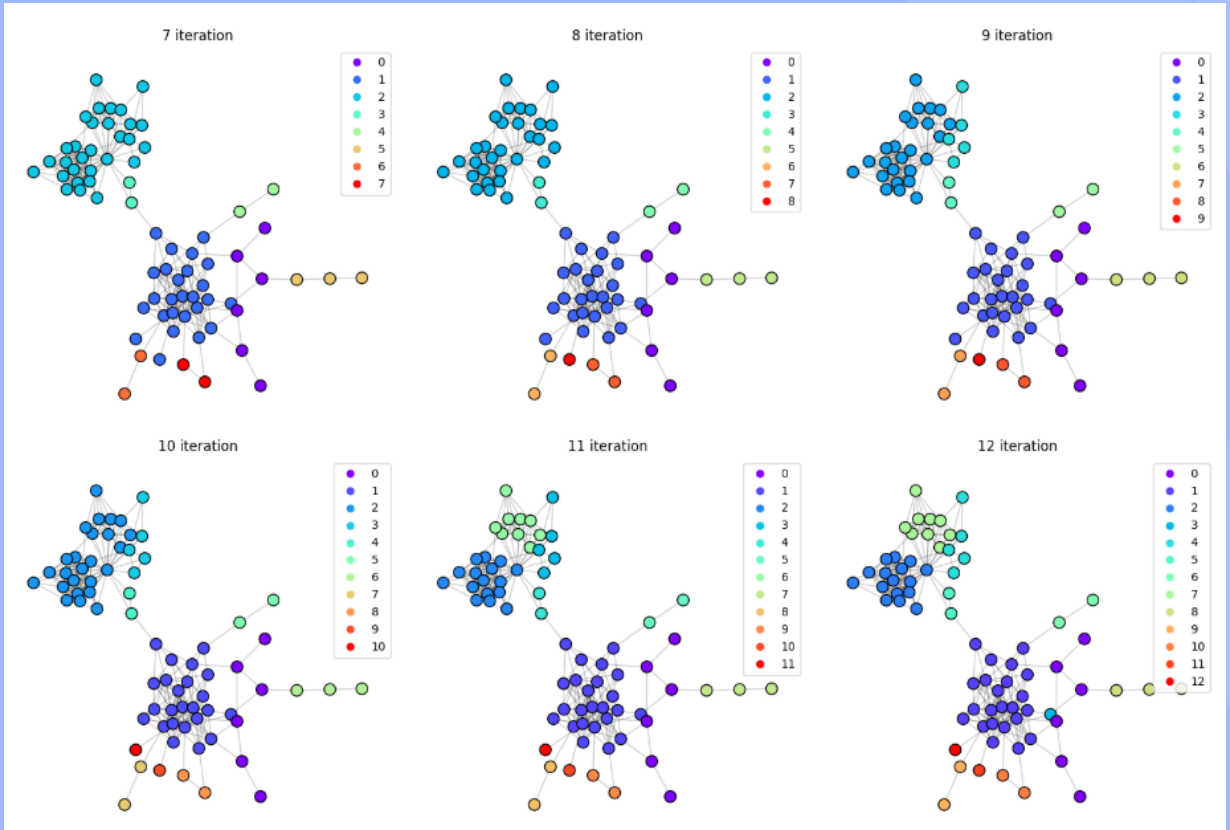
Girvan - Newman



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The End. Thank you!