VK graph analysis

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Data

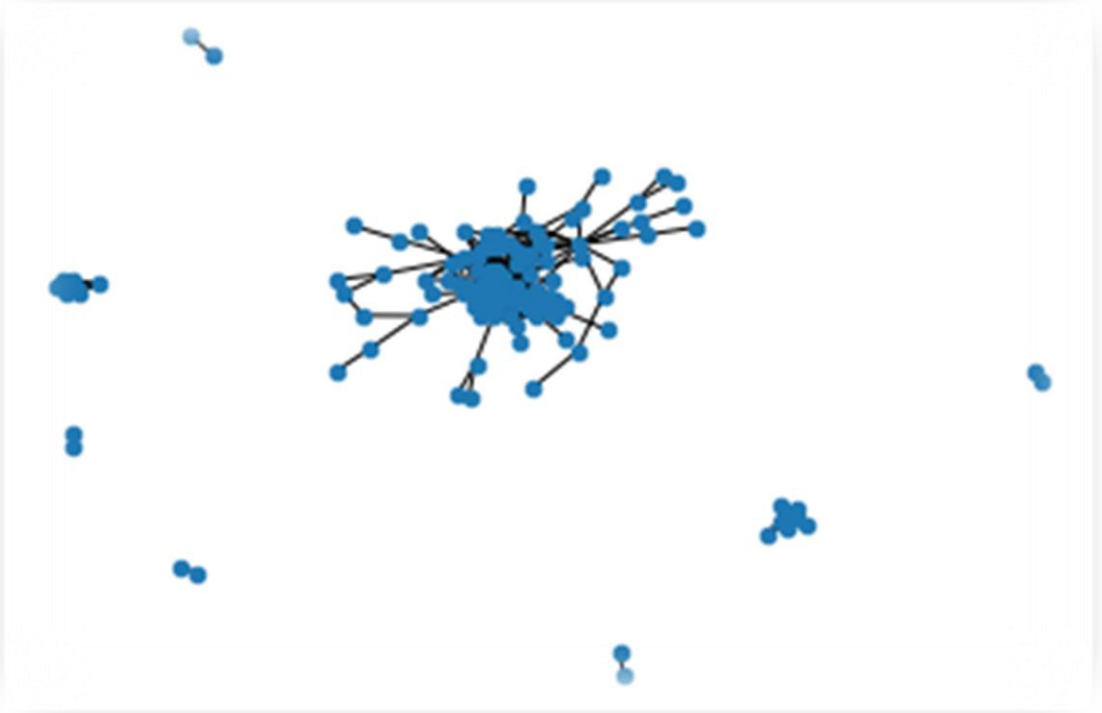
- Graph was extracted be means of http://vk.com/app3861133
- This graph is provided by my friend, as soon as I don't use VK network actively. However, I can not add additonal attributes to nodes, because I don't know most of these people. Also, in data analysis and visualizations I use only first names and ID derivatives due to privacy considerations.

Graph summary

- Number of nodes: 157
- Number of edges: 501
- Average degree: 6.3822

After removing isolates:

- Number of nodes: 138
- Number of edges: 501
- Average degree: 7.2609

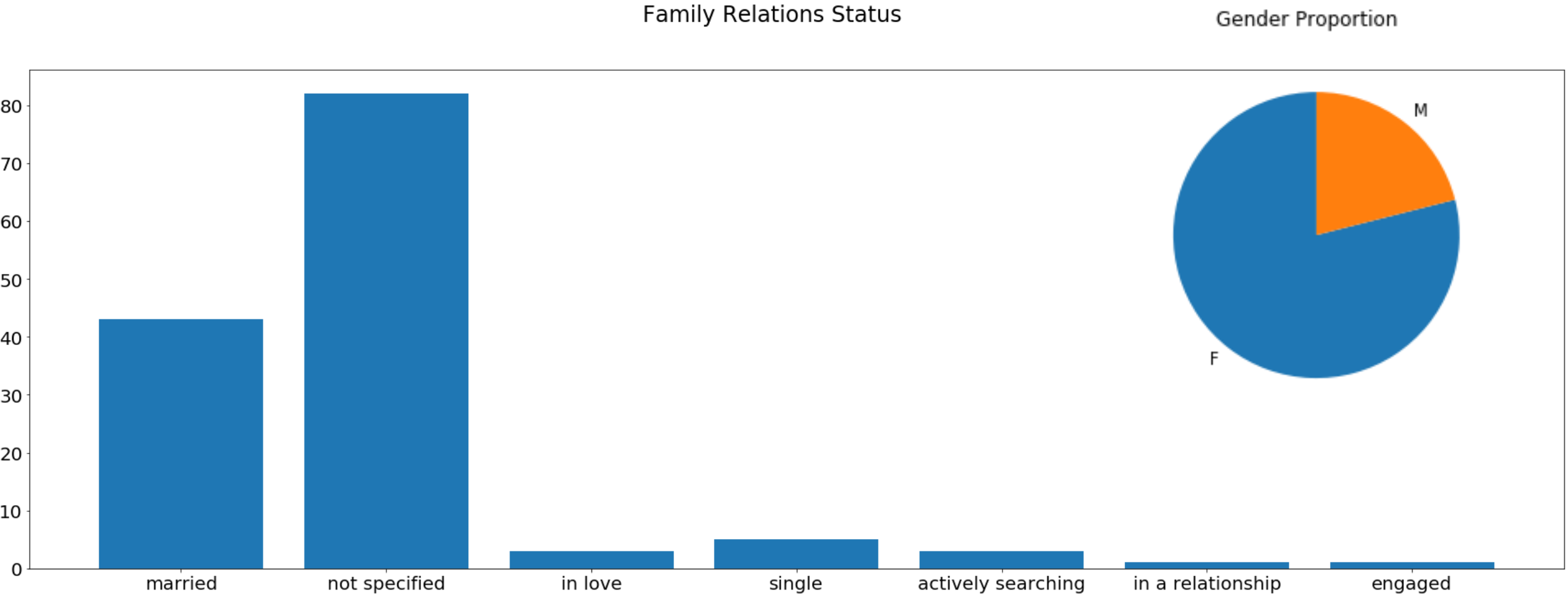


Node attributes

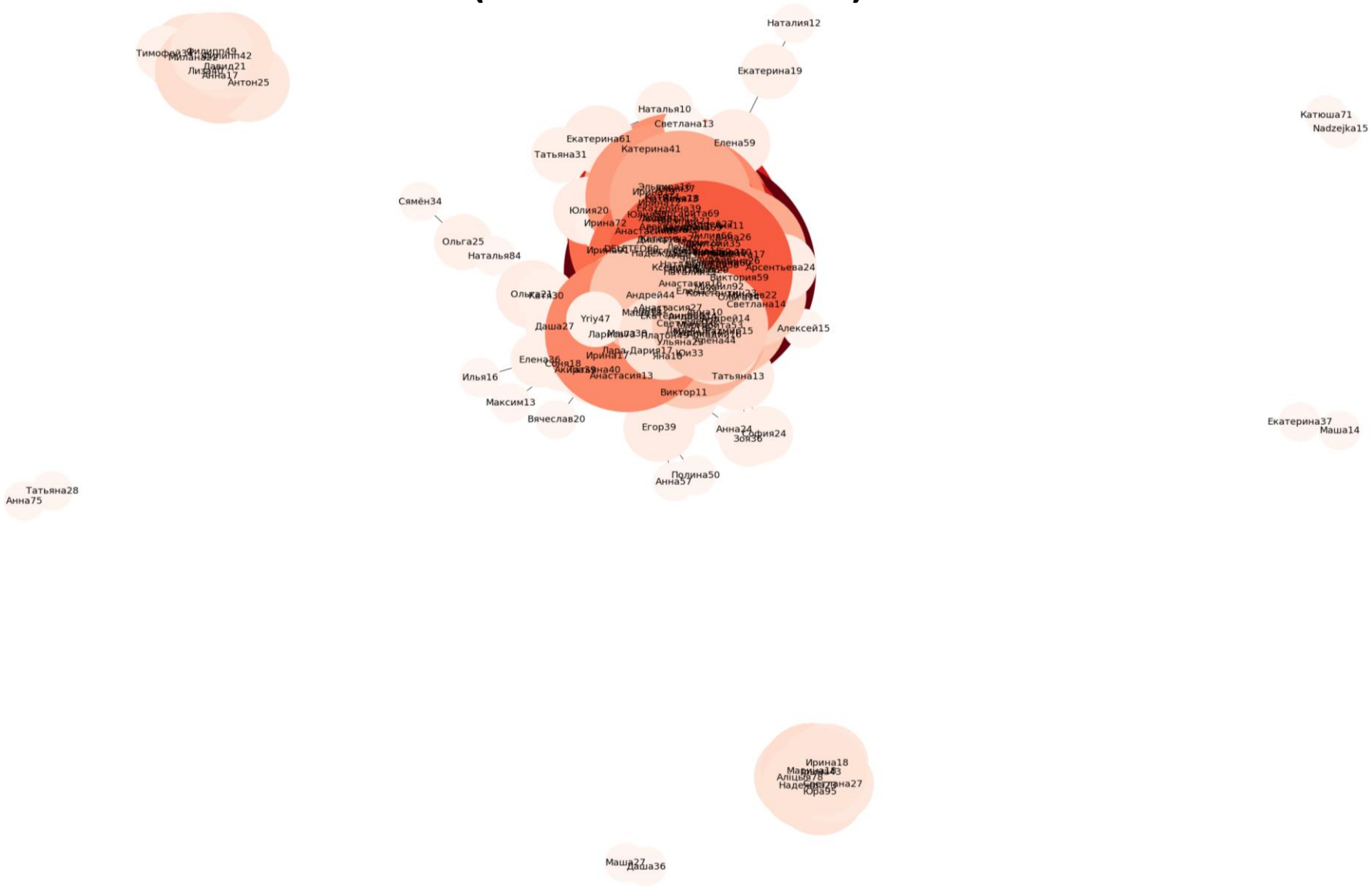
Unfortunately, recommended app which produced the graph cannot access all the attributes, as date of birth or city/country. Data of birth is accessible only for some users, but location is the same for all users.

- Features provided for every node:
- id
- first name
- last name
- gender
- personal relations status (most, but not every)

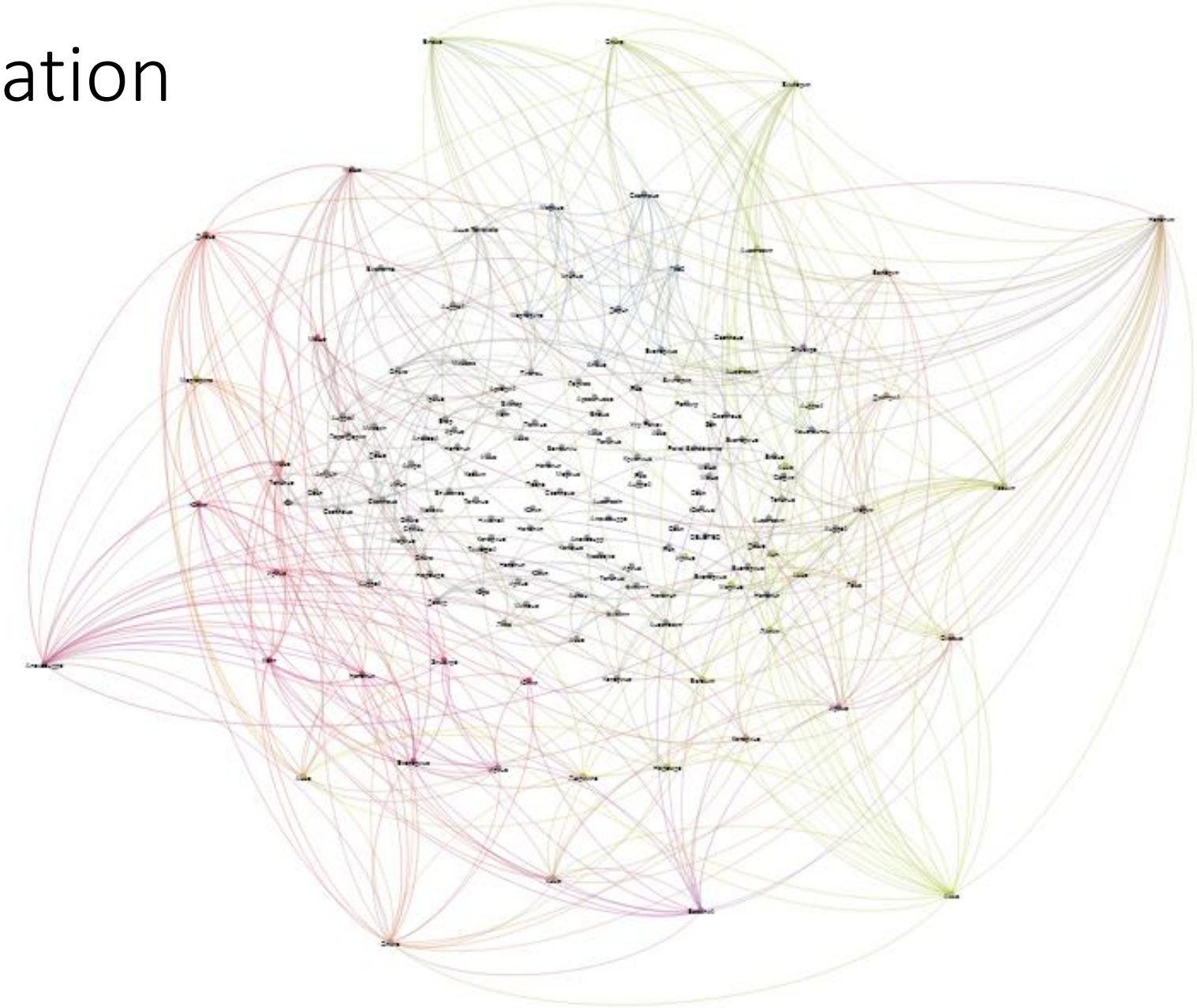
Node attributes



Network visualization (NetworkX)

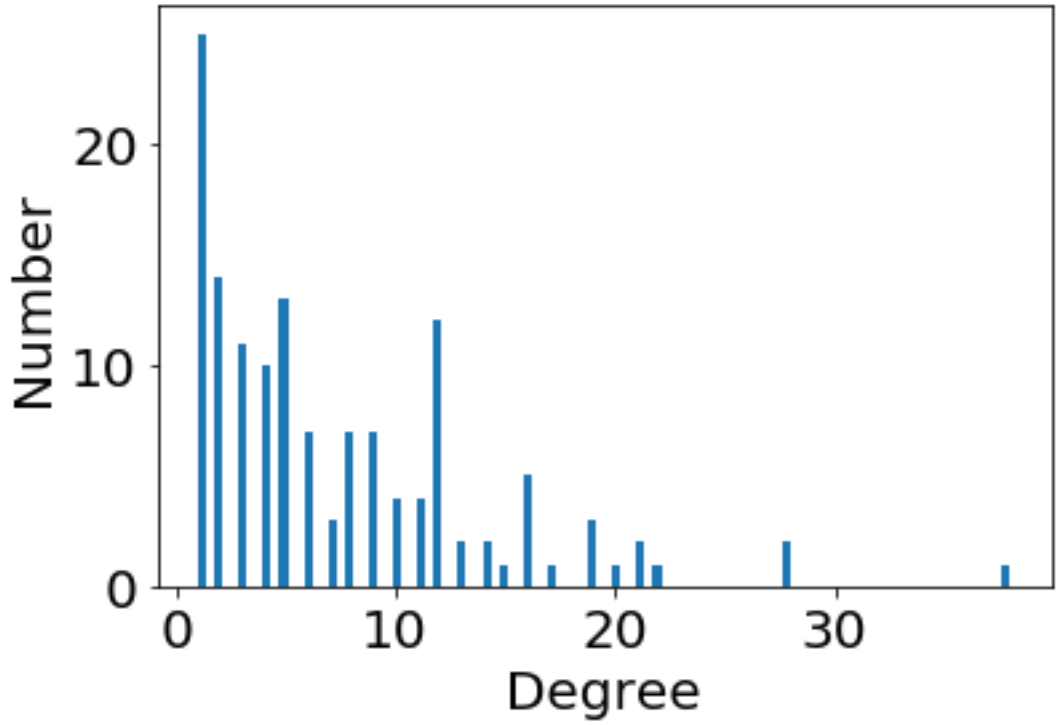


Network visualization (Gephi)



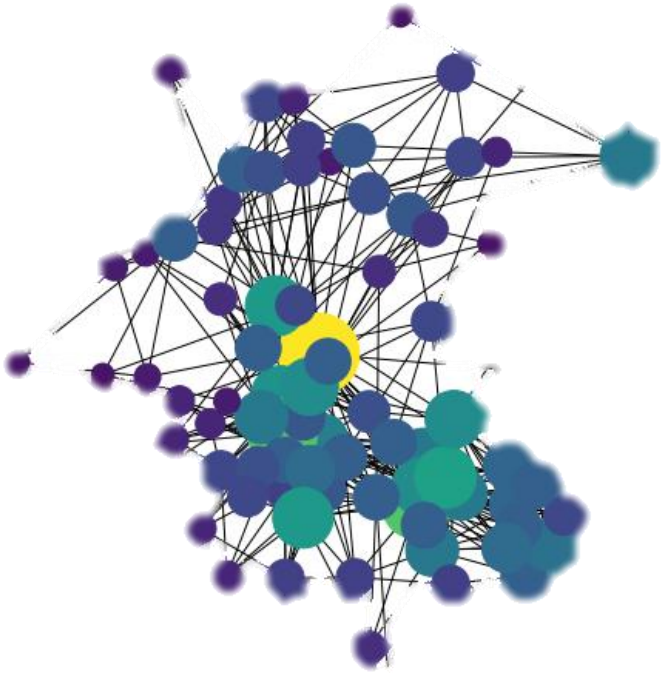
Network properties

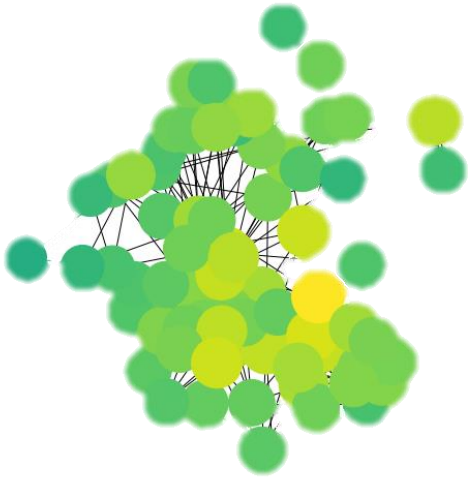
- Degree distribution

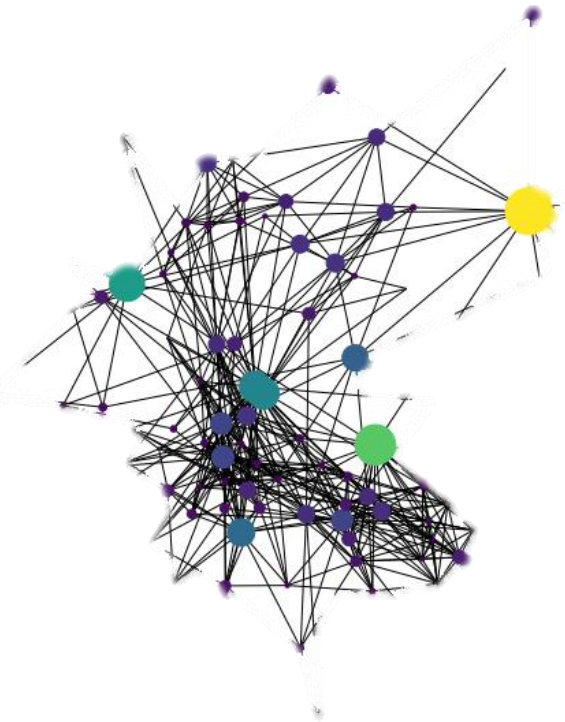


- Max degree: 38
- Mean degree: 7.3
- Diameter: 8
- Clustering Coefficient: 0.4

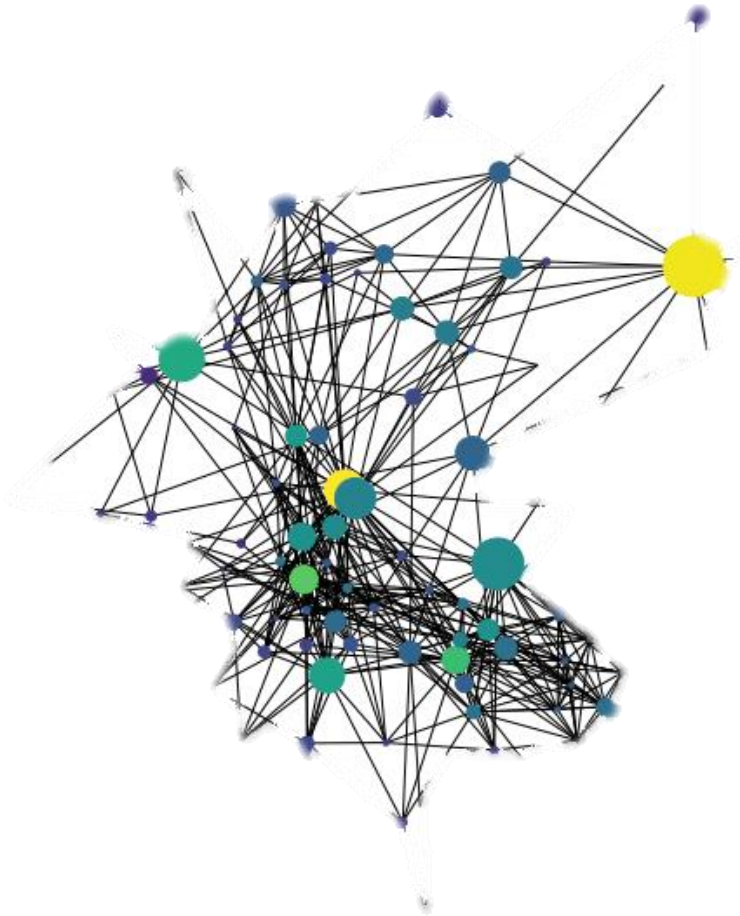
Degree vs Closenesess vs Betweenness







PageRank



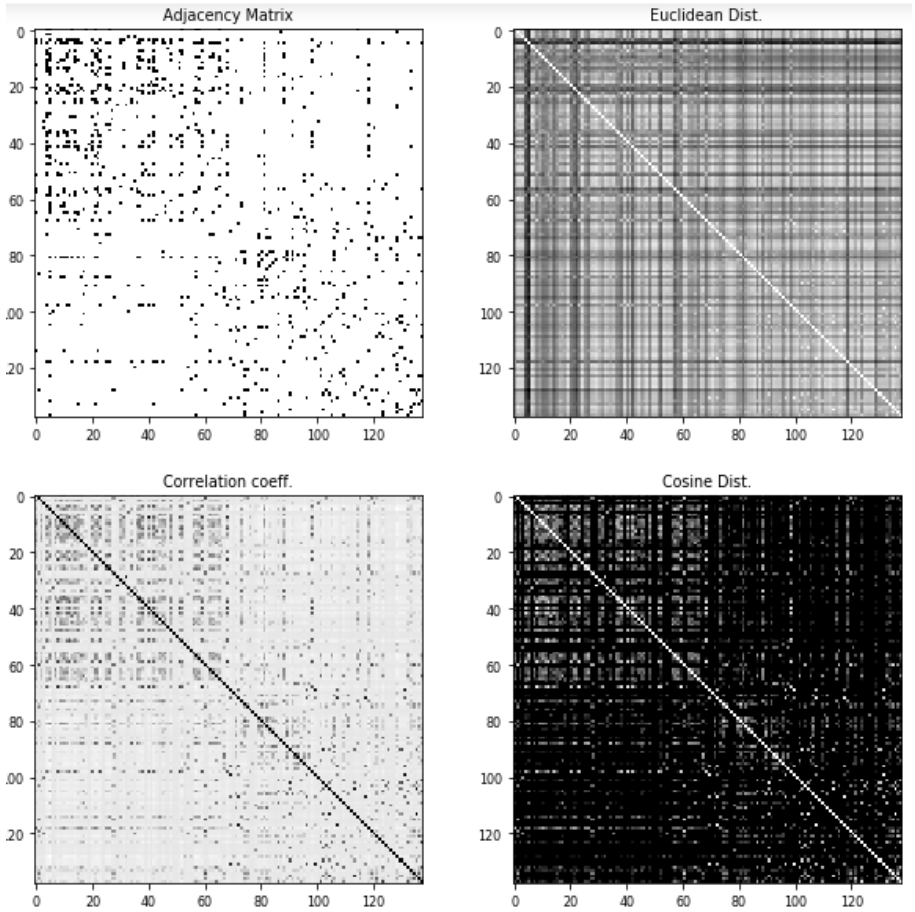
Assortative Mixing

Degree assortativity coefficient: 0.16

Attribute assortativity coefficient (gender): 0.1

This attribute seems to be not really influential

Node Structural Similarity

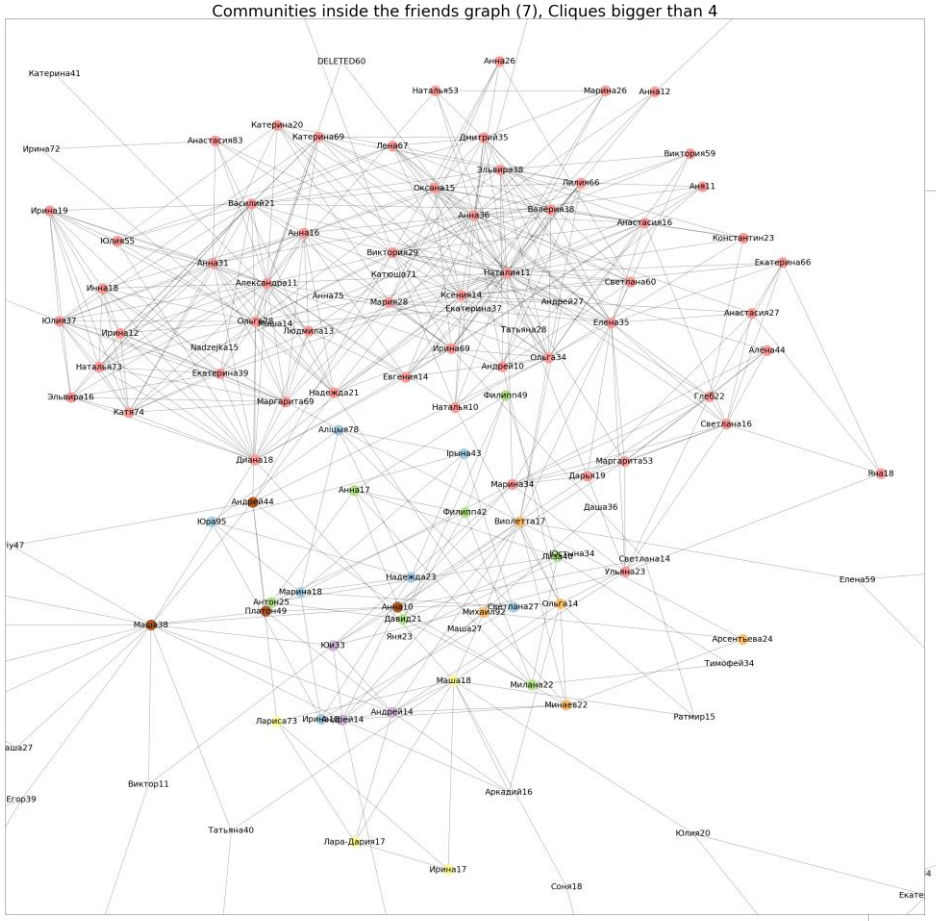


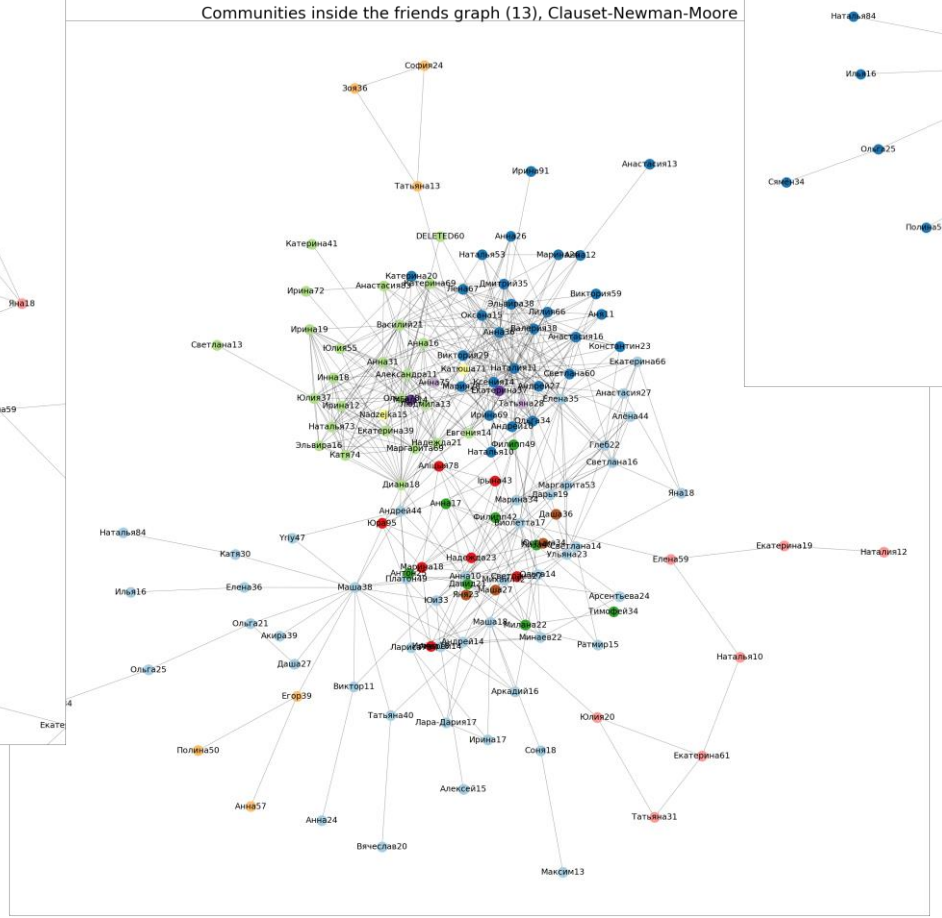
Comparison to random graphs

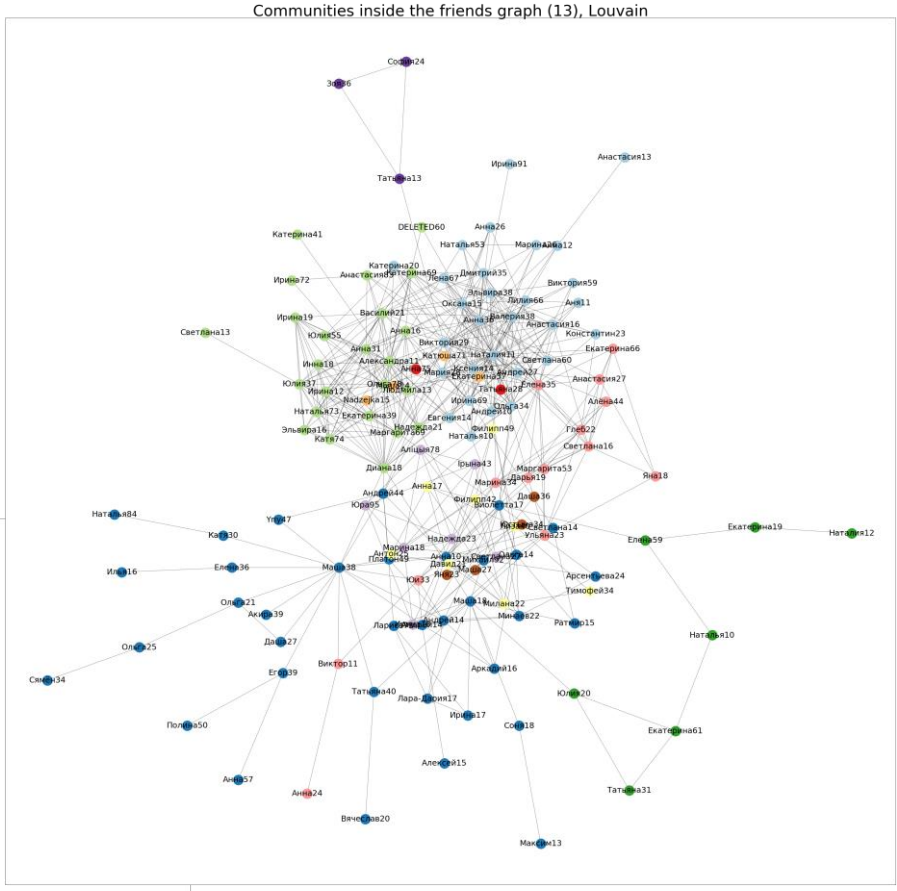
Metrics	Original	Barabasi-Albert	Rand.reg	GNM
Nodes	138	138	138	138
Edges	501	917	483	501
Mean degree	7.3	13.2	7	7.3
Clust. coef.	0.41	0.16	0.038	0.04
Diameter	8	3	4	5

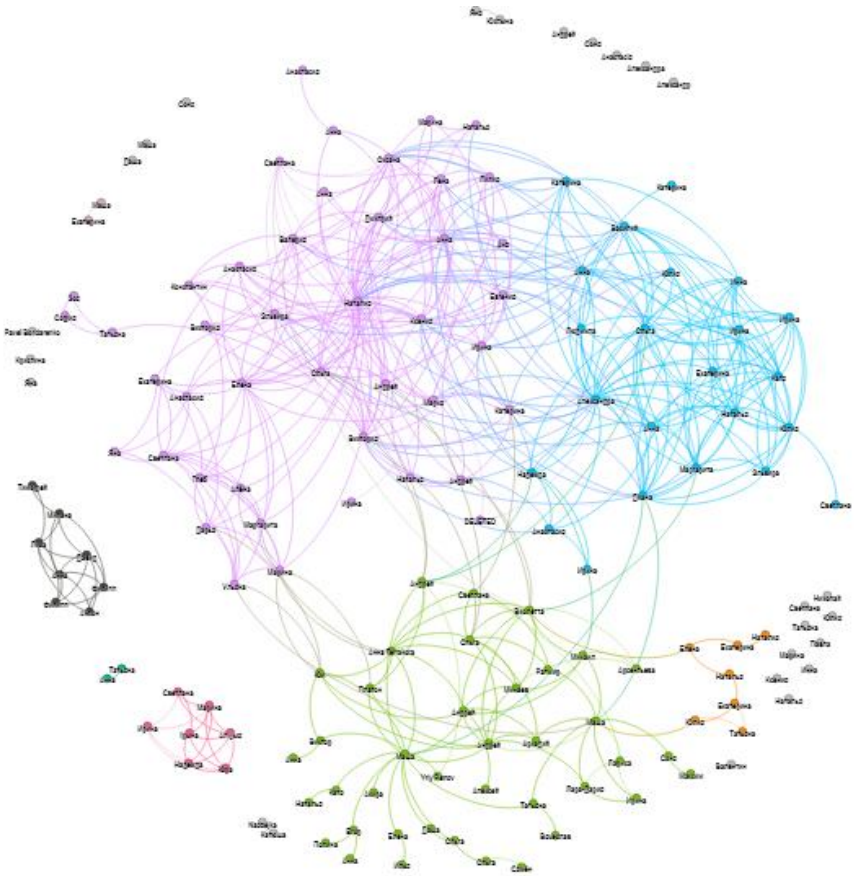
Despite there is no identical graph was generated via random graph algorithms, one could say that Random Regular Graph is the most similar to ours.

Communities









Gephi (clustering on modularity)