Network Science Social Network Analysis

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outline

- Introducing network
- Network Summary
- Structural Analysis
- Community Detection

Introducing Network

- Network used is for my roommate
- Link to profile here
- Used vk_api python module that has many methods supporting the request generations
- Saved network in gml file because I don't have credentials for account
- Loaded the gml content to the notebook and started processing

Network Summary

Number of nodes: 541

Number of edges: 6745

Number of connected components: 25

Diameter: 8

|	id	name	sex	city	university	relationship	friends	smoking	alcohol	life_main	people_main
0	561636	Amalia Avetisyan	1	Perm	730	0	527	0	0	0	0
1	66755554	Elena Avetisyan	1	Perm	0	1	121	0	0	6	0
2	173078569	Diana Avetisyan	1	Perm	0	3	216	0	0	0	0
3	294517501	DELETED	2	None	0	0	0	0	0	0	0
4	332345423	Anzhelika Avetisyan	1	None	0	0	192	0	0	0	0
...	...	...	...	...	...	...	...	...	...	...	...
536	482272300	Dmitry Morskovatykh	2	Perm	0	1	120	0	0	0	0
537	404905519	Timofey Savinov	2	Perm	0	0	188	0	0	0	0
538	475469183	Sergey Volkonsky	2	None	0	0	0	0	0	0	0
539	500959136	Max Batulin	2	Perm	87	0	2112	3	3	4	6
540	581743322	Ehab EL-Kady	2	Moscow	128	0	26	0	0	0	0

541 rows × 11 columns

Network Summary

- Average clustering coefficient: 0.455
- Average shortest path length: 2.816263529
- This is how nodes tend to cluster together based on their degrees
- The distribution of degrees as stated in the graph
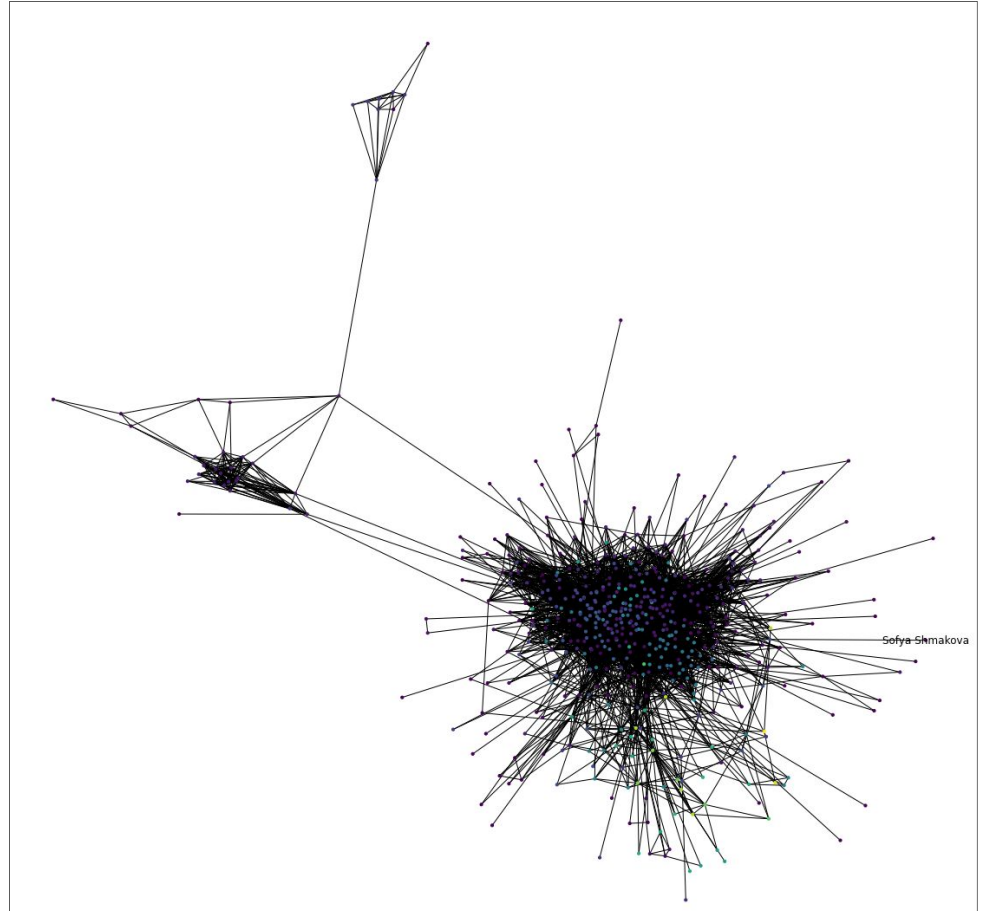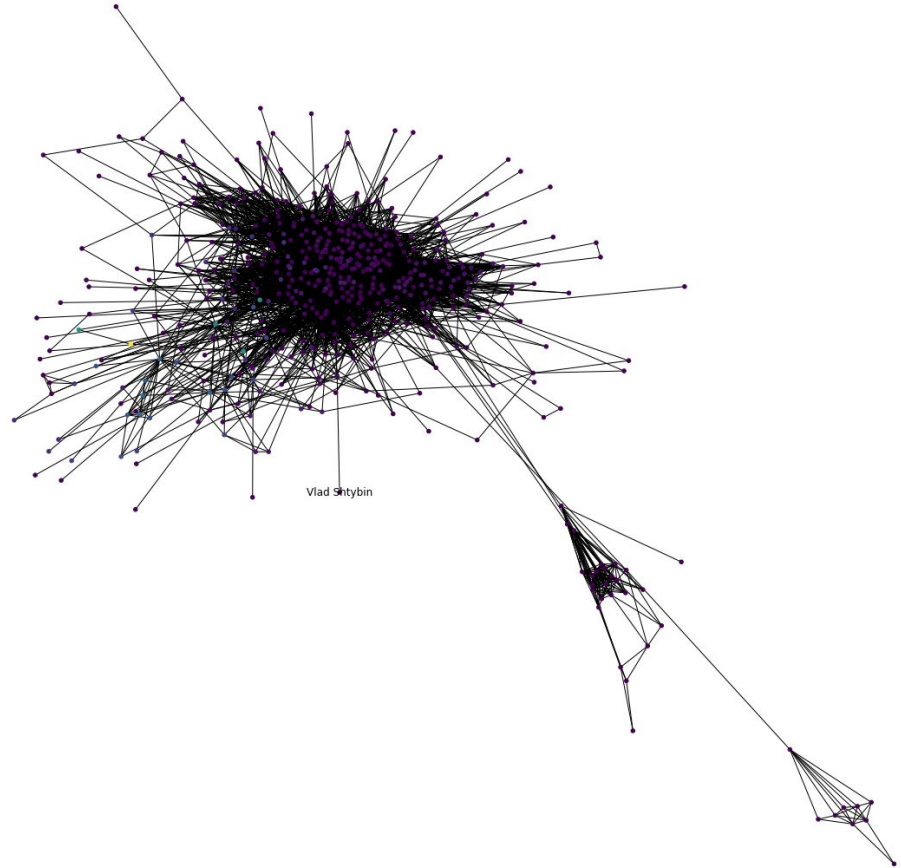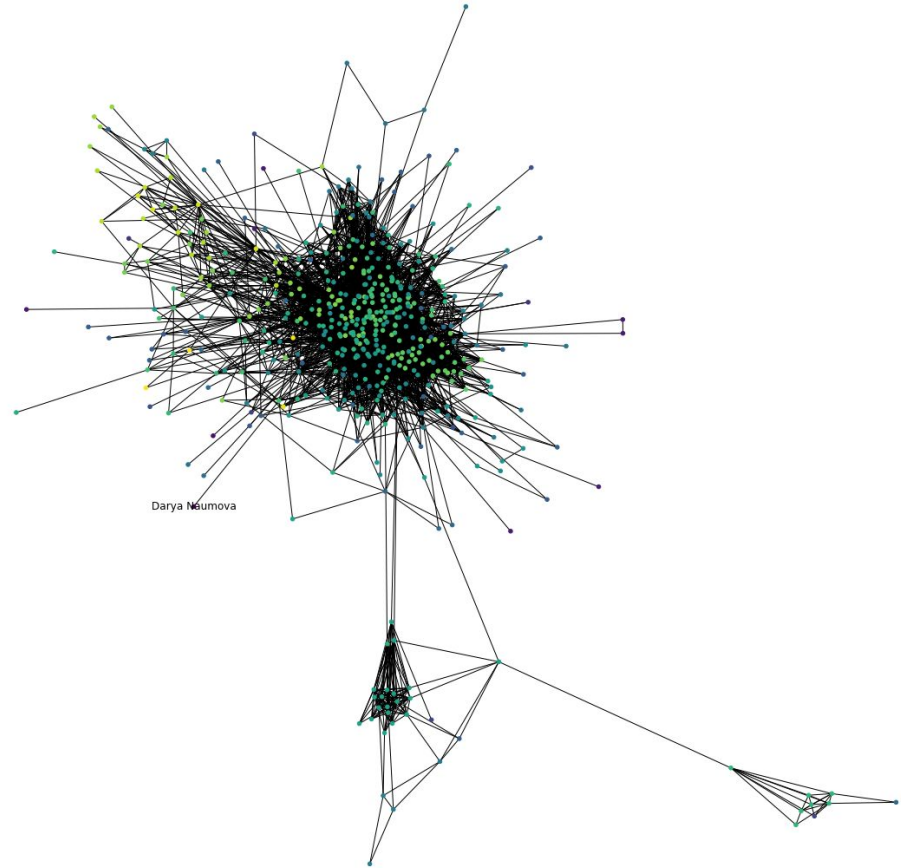- Maximum 8 handshakes between profiles as the diameter is 8

My network degree distribution
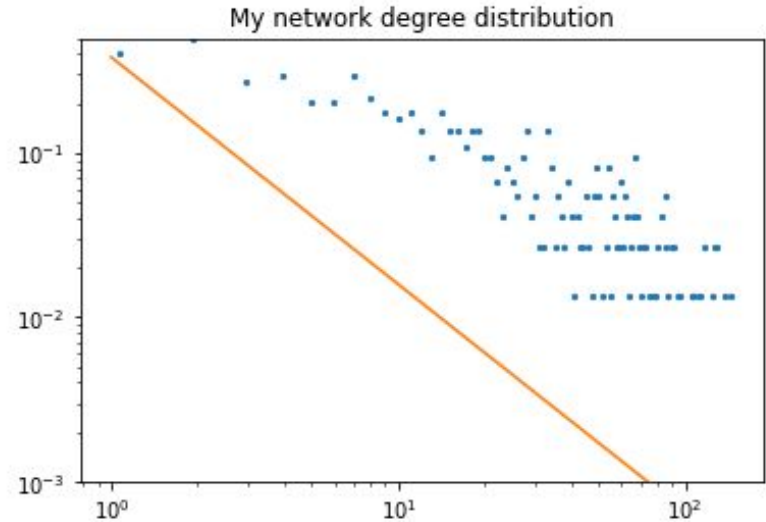
Network Layout
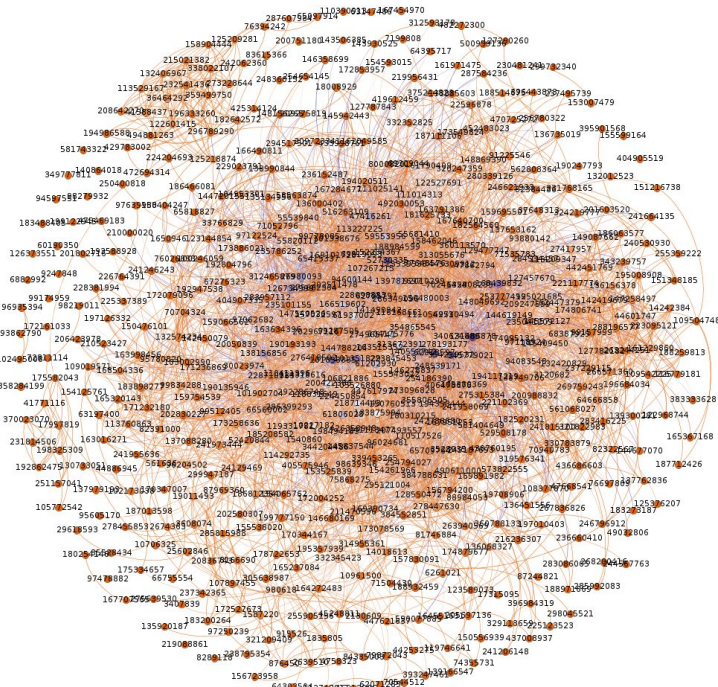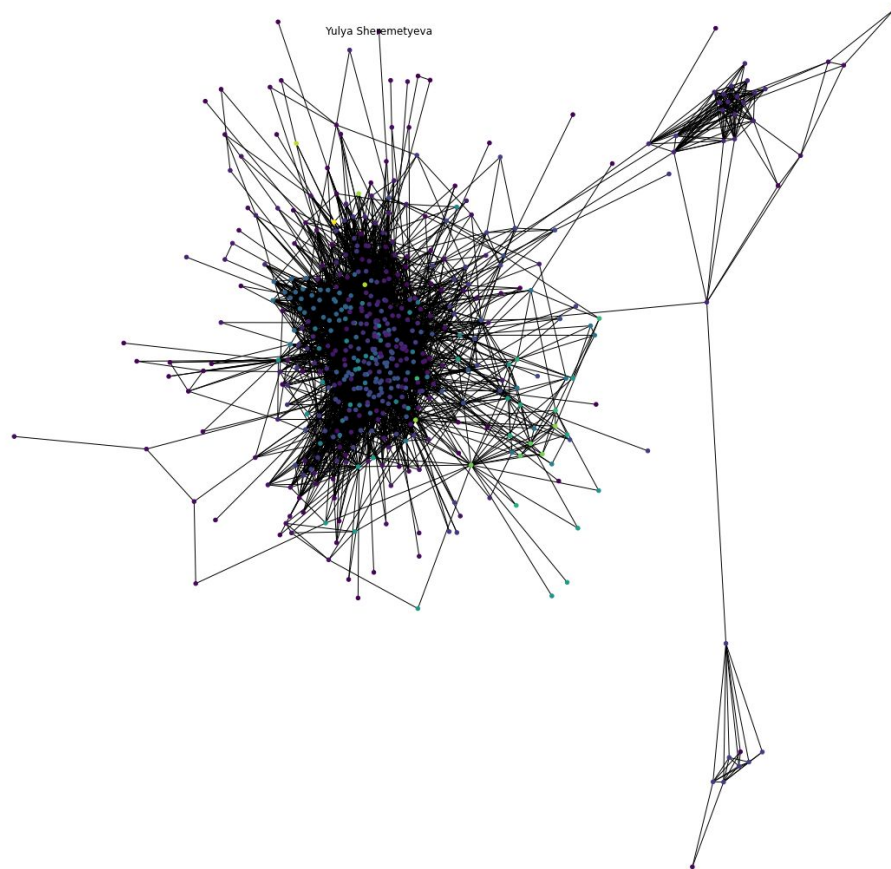
Structural Analysis

Degree Centrality

Sofya Shmakova

betweenness Centrality

Vlad Shtybin

# Closeness Centrality
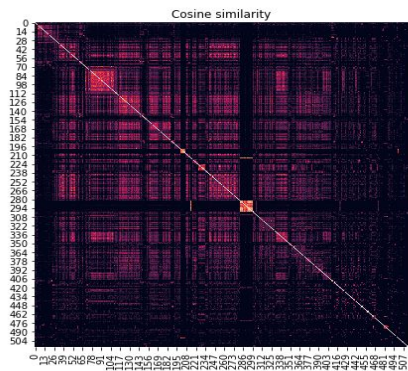

Darya Naumova

# Page Rank

Structural Analysis

- Assortative mixing coefficient for sex is 0.19115912939512733

- Assortative mixing coefficient for city is 0.011035007111909911

- Assortative mixing coefficient for university is 0.07173541967629717

- Assortative mixing coefficient for relationship is 0.0016533432018281957
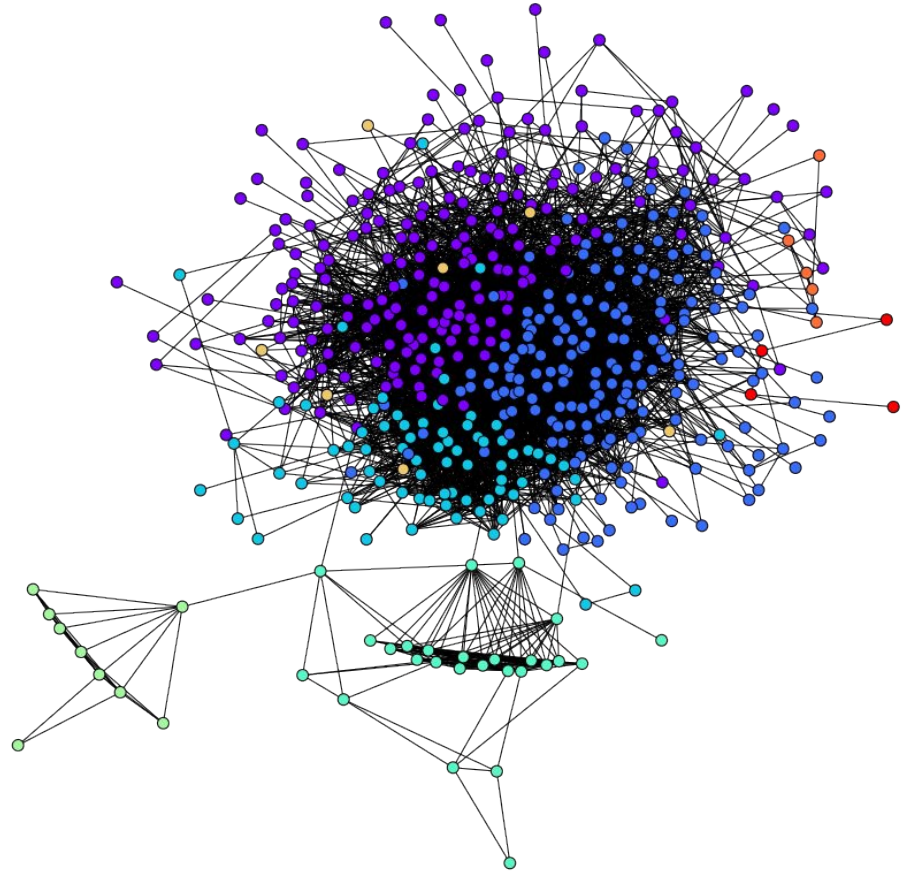
Similarity and equivalence
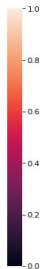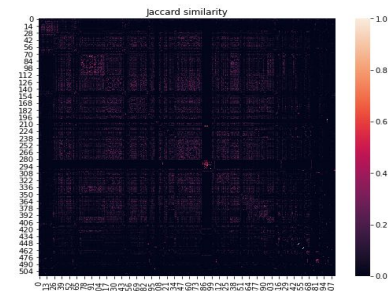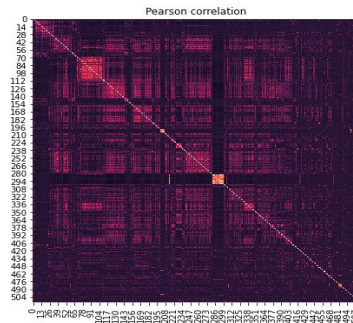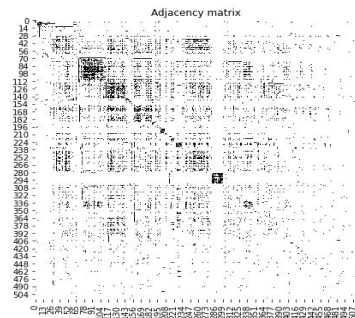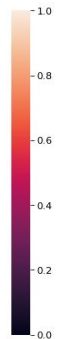
Community Detection

Largest Clique
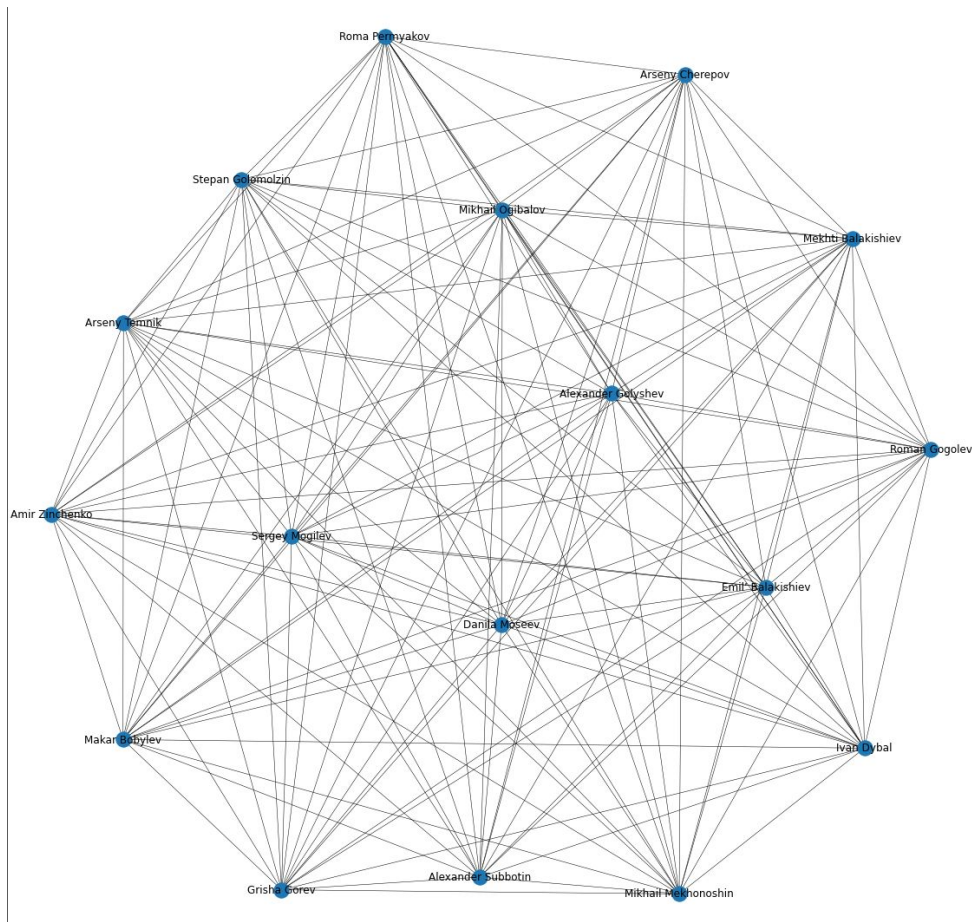
Communities

- From the graph nodes and their connections, there are 8 different communities among my network which share the same connection together.
- Each community has its own coloring representing it to be unique from the other communities.

Thank you!!