

AI EXP NO. - 9 Case Study

Team- Automata lab

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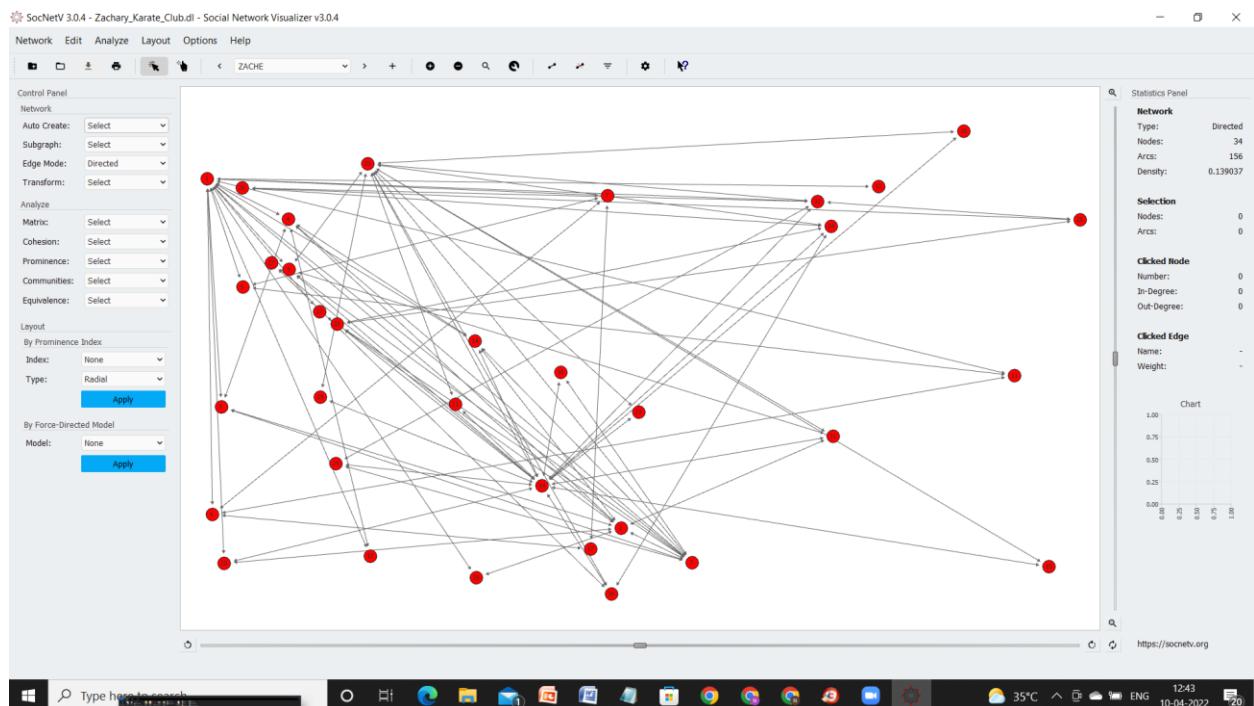
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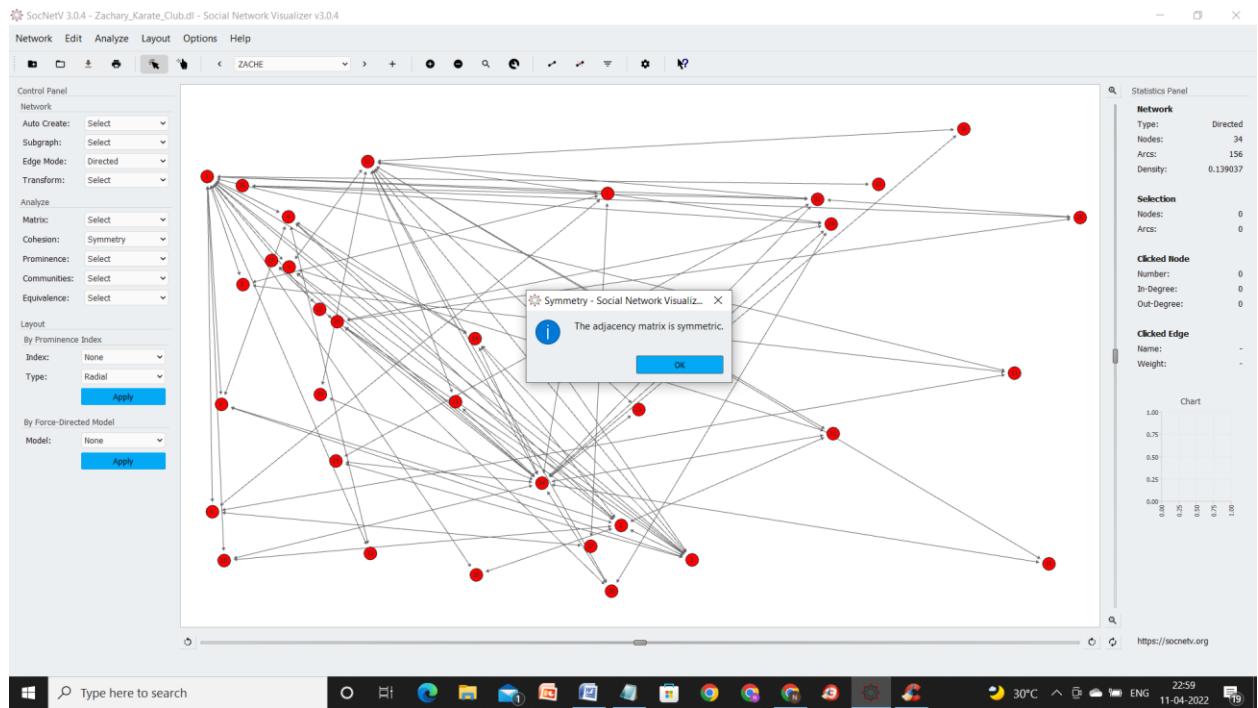
Aim :- To do a case study and explore about Semantic Networks/Frames/Rules and a data set.

Data Set :- Social Network Visualization of –Zachary:Karate Club(binary & valued ties),34 actors



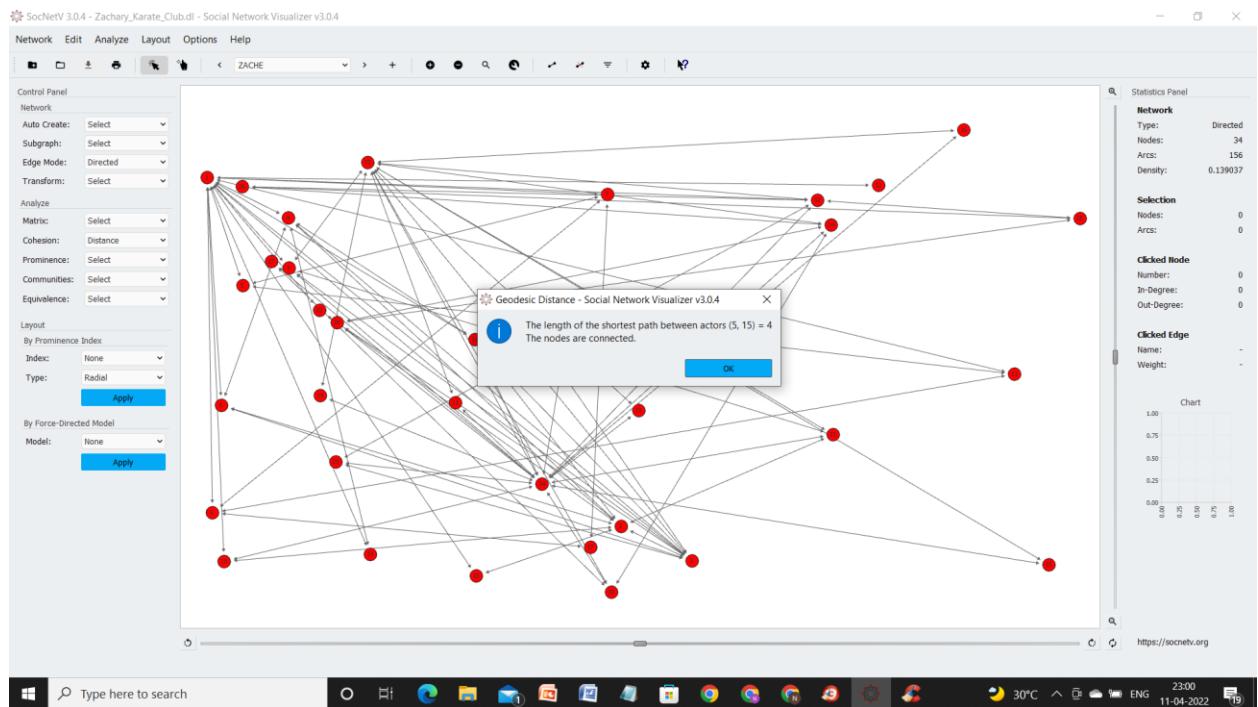
Semantic Networks

Symmetry



Tells whether the matrix formed for the graph is symmetric or not.

Distance

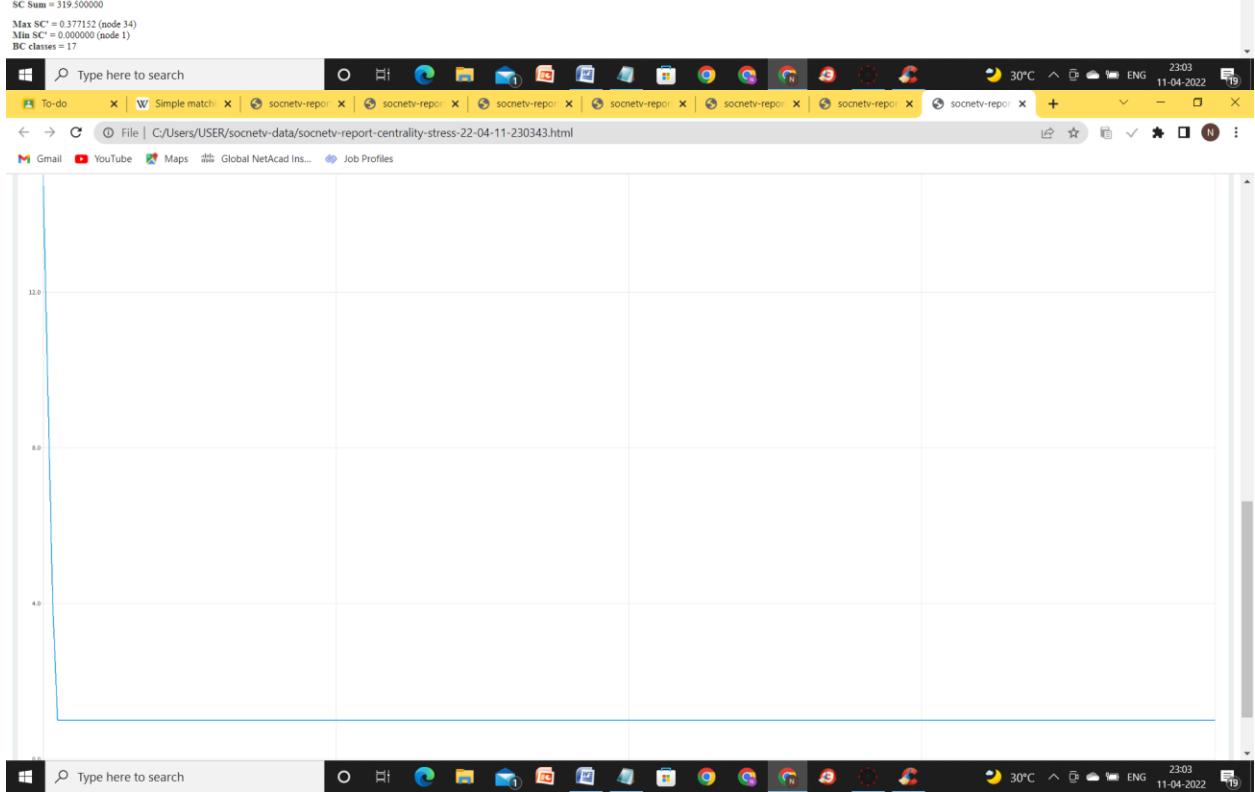


The degree centrality of a node in a graph is simply a count of the number of edges that connect to it. Degree centrality is the simplest measure of node connectivity. For finding very connected individuals, popular individuals, individuals who are likely to hold most information or individuals who can quickly connect with the wider network.

Stress Centrality

SC range: $0 \leq SC \leq 528$
 $SC^* \text{ range: } 0 \leq SC^* \leq 1$ ($SC^*=1$ when the node falls on all geodesics)

Node	Label	SC	SC*	%SC*
1	-	0.000000	0.000000	0.000000
2	-	30.000000	0.091397	9.398771
3	-	8.500000	0.026694	2.694947
4	-	13.000000	0.040859	4.088558
5	-	1.000000	0.003130	0.312989
6	-	1.000000	0.003130	0.312989
7	-	16.000000	0.050708	5.07825
8	-	0.000000	0.000000	0.000000
9	-	14.500000	0.045383	4.538341
10	-	2.000000	0.006260	0.625978
11	-	1.000000	0.003130	0.312989
12	-	0.000000	0.000000	0.000000
13	-	0.000000	0.000000	0.000000
14	-	18.500000	0.057903	5.79297
15	-	0.000000	0.000000	0.000000
16	-	0.000000	0.000000	0.000000
17	-	0.000000	0.000000	0.000000
18	-	0.000000	0.000000	0.000000
19	-	0.000000	0.000000	0.000000
20	-	15.000000	0.046948	4.694836
21	-	0.000000	0.000000	0.000000
22	-	0.000000	0.000000	0.000000
23	-	0.000000	0.000000	0.000000
24	-	1.000000	0.003130	0.312989
25	-	1.500000	0.004695	0.469484
26	-	0.000000	0.000000	0.000000
27	-	0.000000	0.000000	0.000000
28	-	9.000000	0.023169	2.316901
29	-	3.500000	0.010951	1.095462
30	-	0.000000	0.000000	0.000000
31	-	9.500000	0.029734	2.973396
32	-	18.500000	0.120501	12.050178
33	-	15.500000	0.048513	4.851330
34	-	120.500000	0.377152	37.715180



The stress centrality of a node n is the number of shortest paths passing through n. A node has a high stress if it is traversed by a high number of shortest paths.

Communities

Cliques



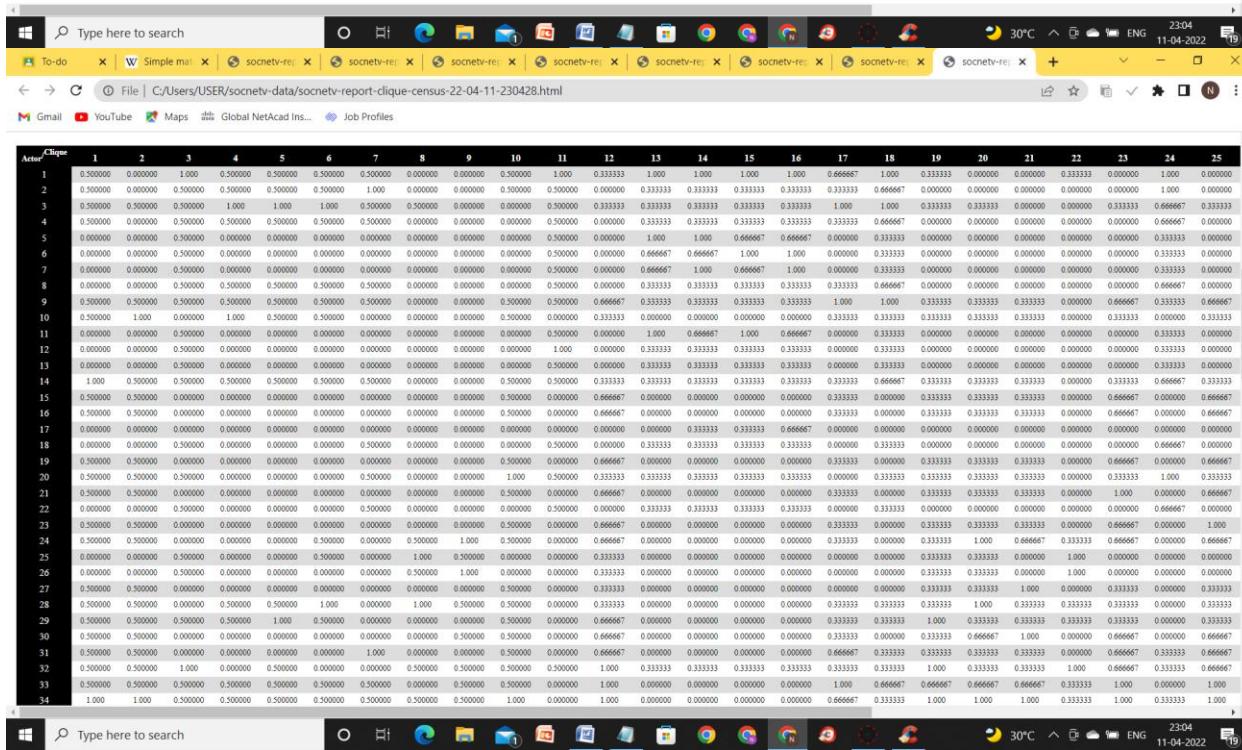
A clique is the largest subgroup of actors in the social network who are all directly connected to each other (maximal complete subgraph).

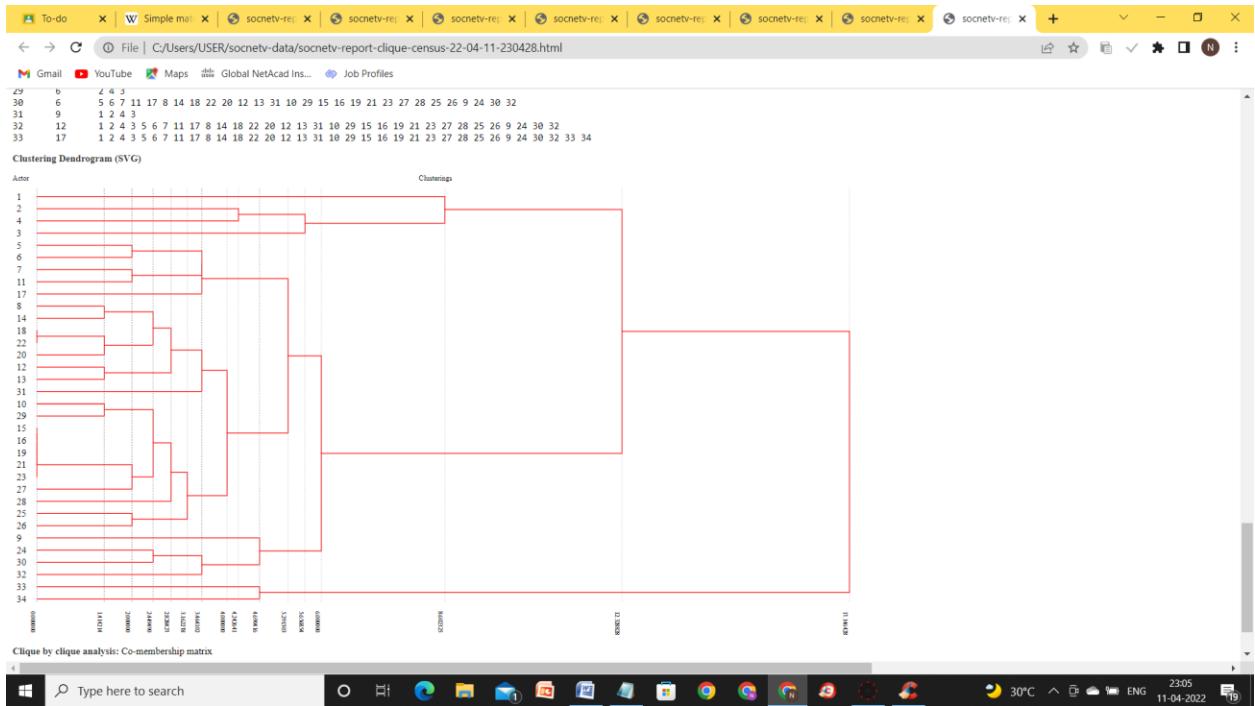
SocNetV applies the Bron-Kerbosch algorithm to produce a census of all maximal cliques in the network and reports some useful statistics such as disaggregation by vertex and co-membership information.

Maximal Cliques found: 36

Clique No.	Clique members:
1	34 14
2	34 10
3	1 32
4	3 10
5	29 3
6	28 3
7	31 2
8	22 28
9	26 24
10	20 34
11	12 1
12	34 32 33
13	13 11
14	1 7 5
15	1 6 11
16	1 6 7
17	3 33 9
18	3 1 9
19	29 34 32
20	34 24 31
21	27 30 34
22	26 25 32
23	21 24 33
24	20 2 1
25	23 34 33
26	22 2 1
27	17 6 7
28	16 34 33
29	19 34 33
30	18 2 1
31	13 1 4
32	15 34 33
33	31 34 33 9
34	24 30 34 33
35	2 3 1 4 14
36	2 3 1 4 8

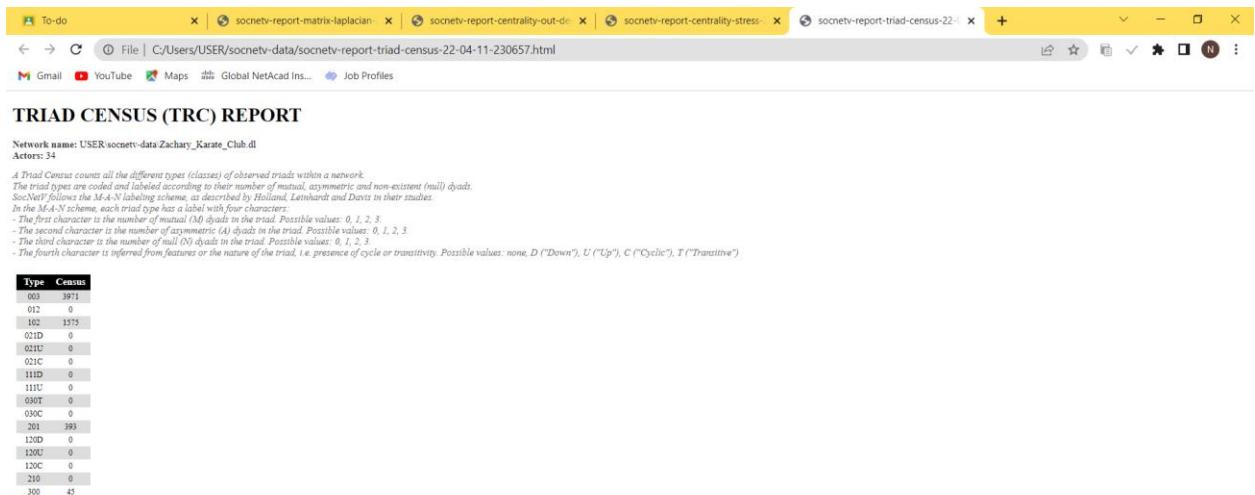
Actor by clique analysis: Proportion of clique members adjacent





A clique is a subset of vertices of an undirected graph such that every two distinct vertices in the clique are adjacent.

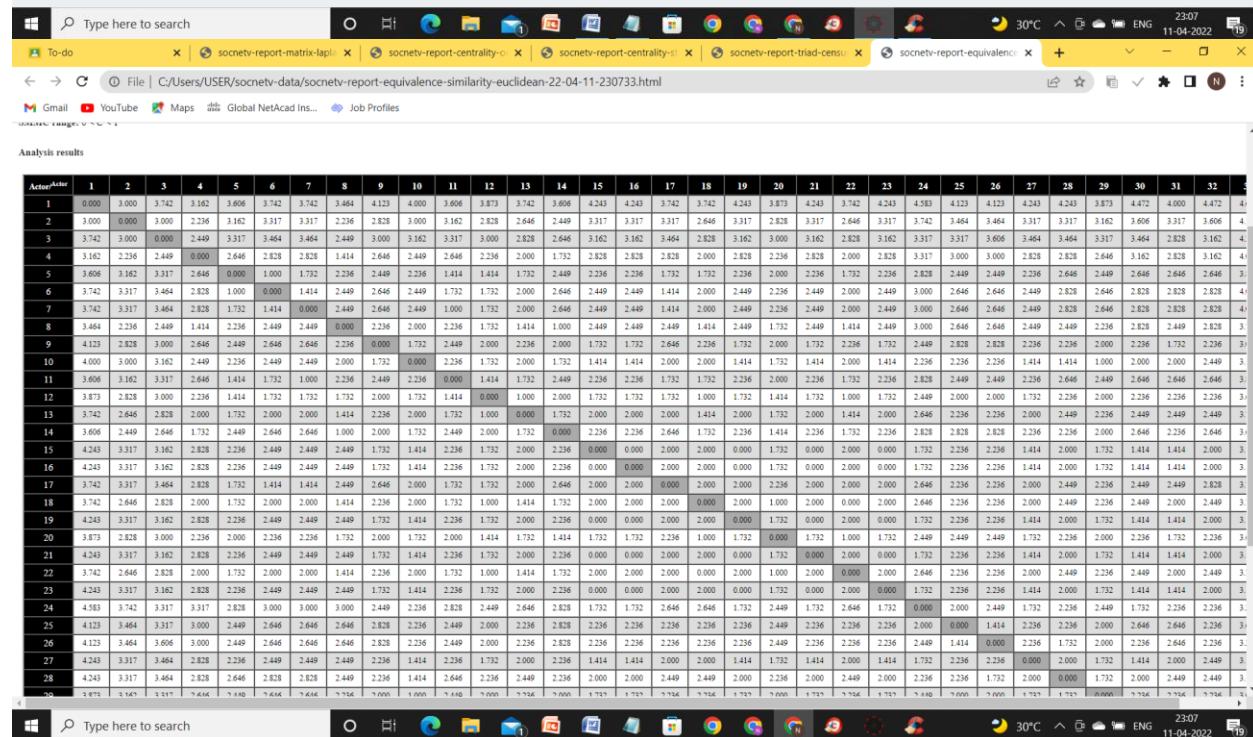
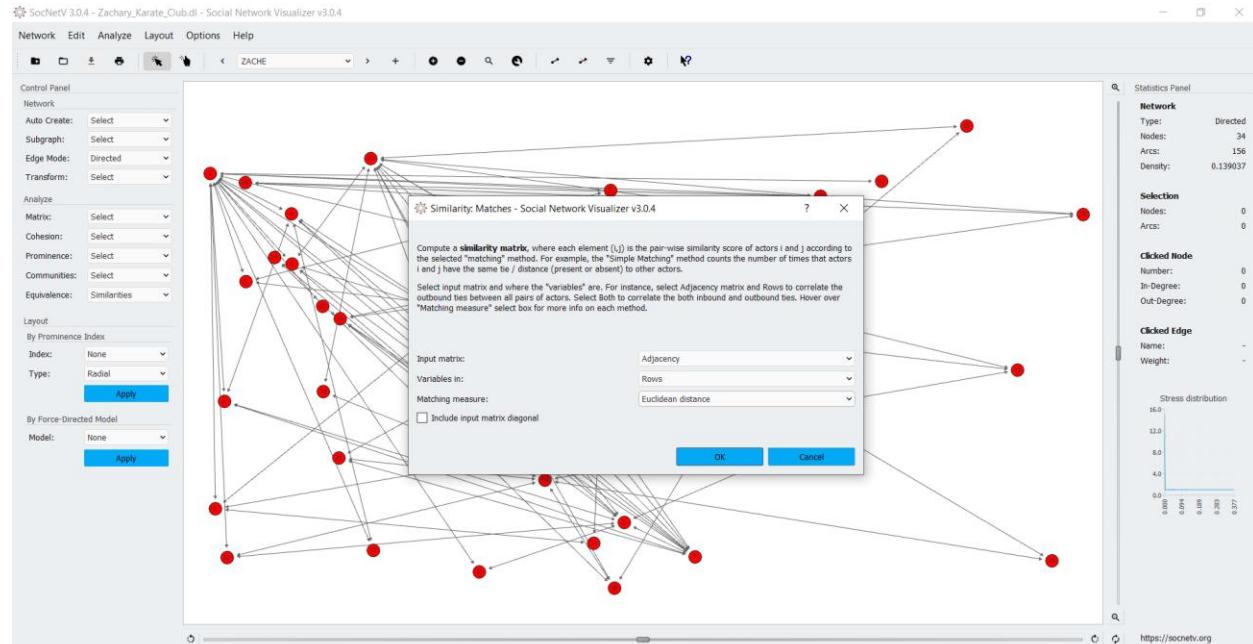
Triad Census



The triadic census is a count of how many of the 16 possible types of triads are present in a directed graph.

Equivalence

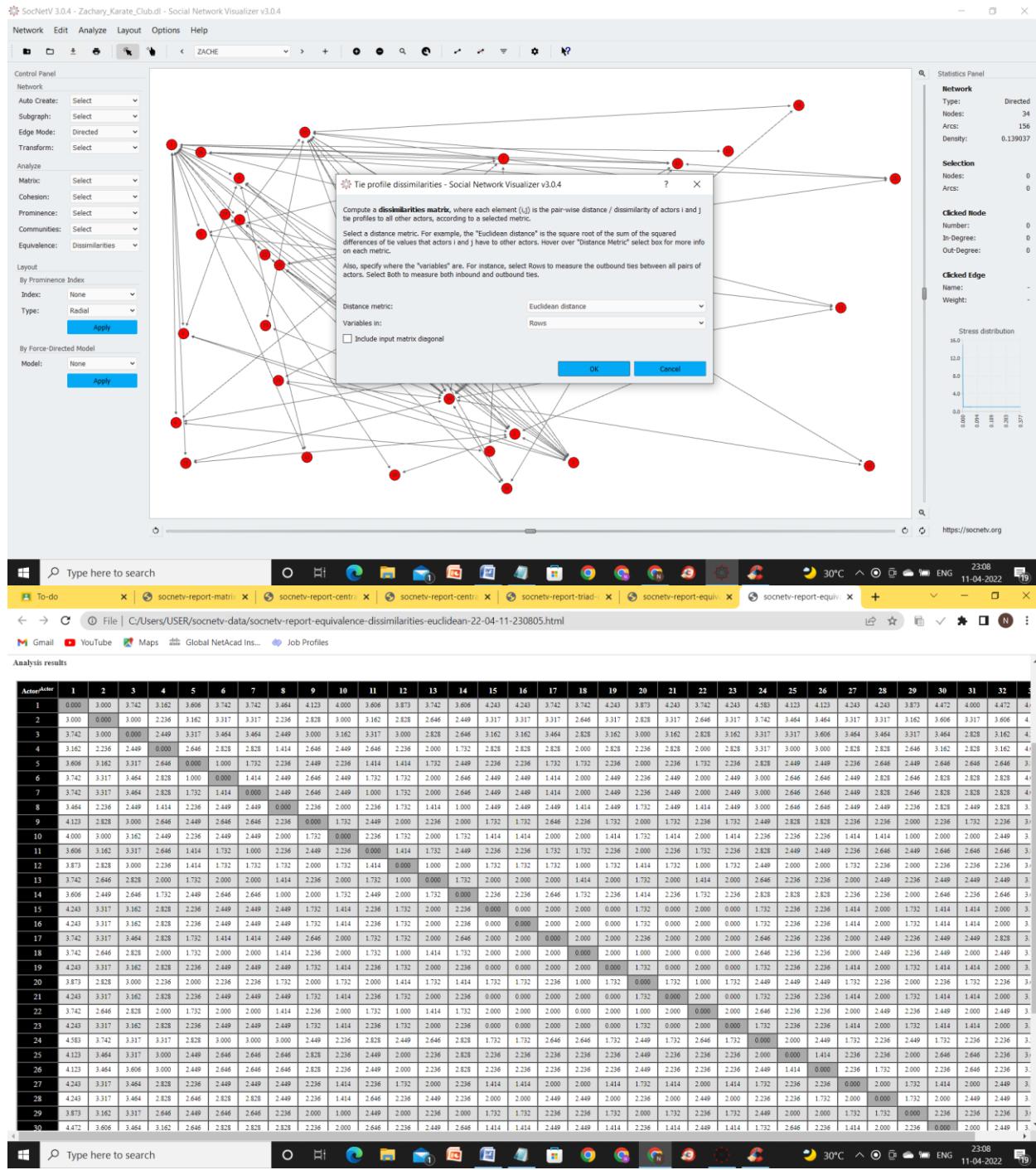
Similarities



Computing a similarities matrix ,where each element(i,j)is the pairwise similarity score of actors i and j according to the selected matching method by selecting input matrix ,where the

variables are (e.g.-rows), matching measures (e.g.-euclidean distance) to correlate the outbound ties between all pairs of actors (i,j).

Dissimilarities



Computing a dissimilarities matrix ,where each element(i,j)is the pairwise dissimilarity of actors i and j tie profiles to all other actors, according to the selected distance metric. Also specify where the variables are.

Result :-

Case study on Semantic Networks/Frames/Rules and the above data set is done successfully.