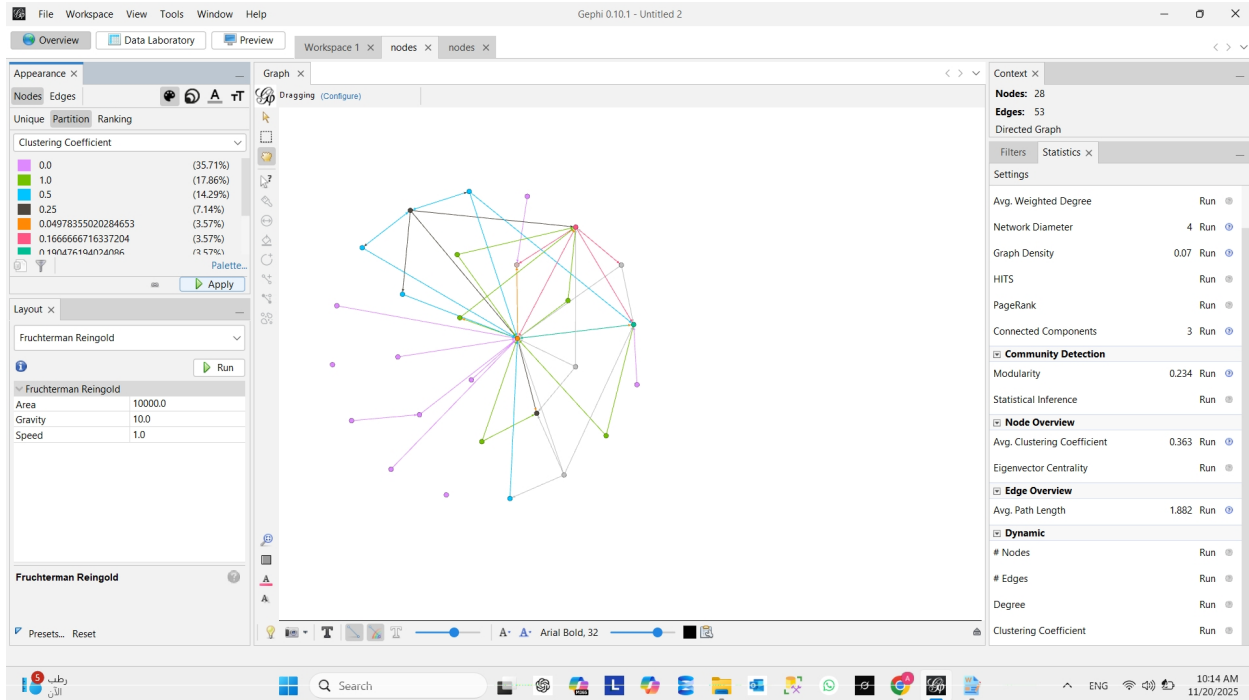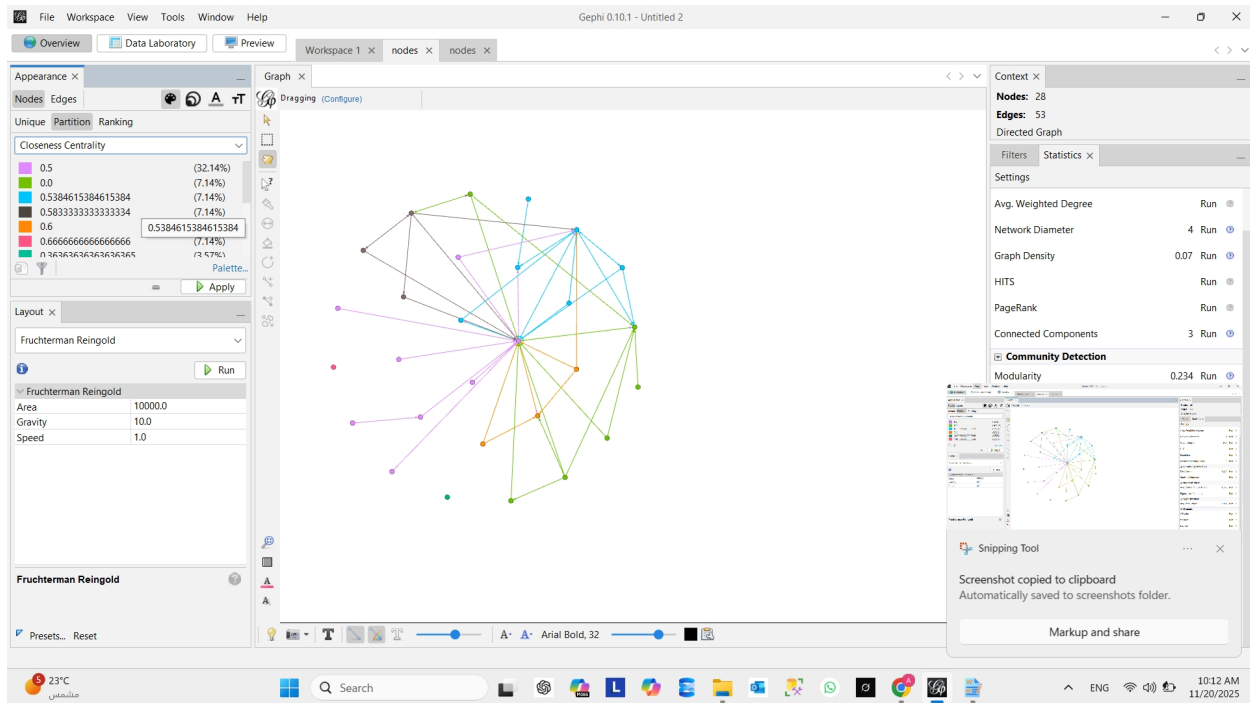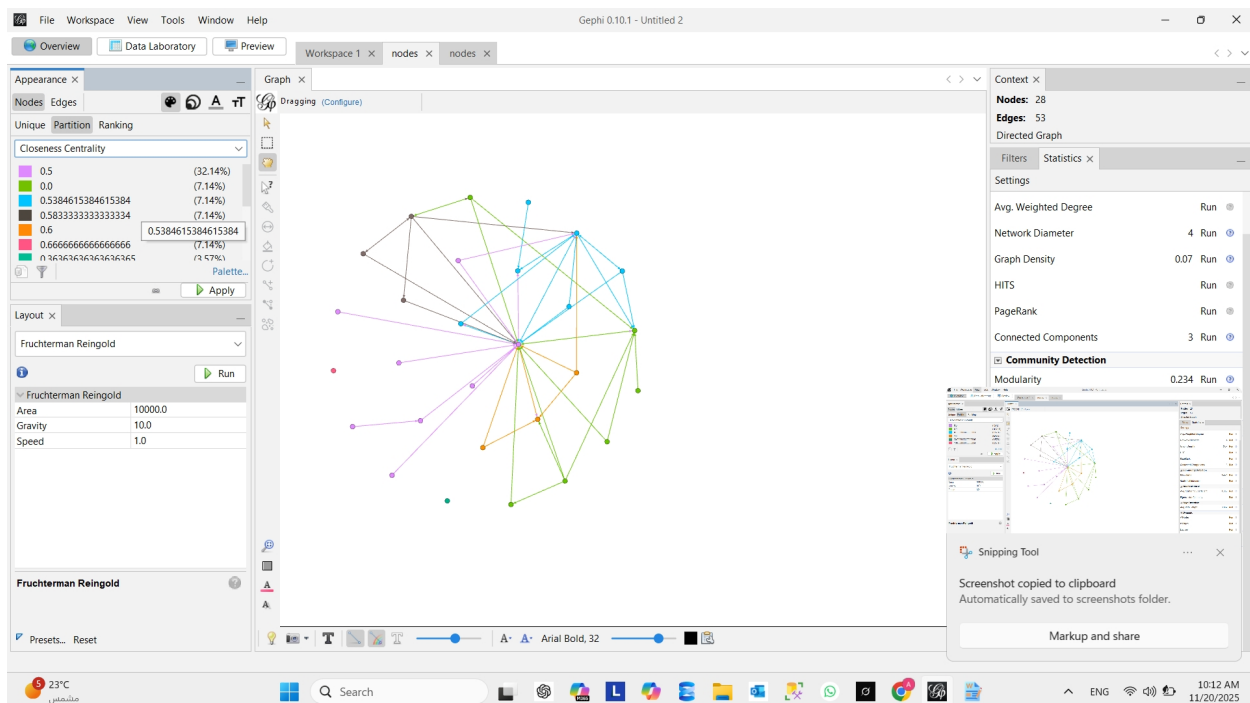**Non_Conspiracy_Graphs**.

Statistics for the following metrics

- o Number of nodes and edges: 28 53

- o Average degree: 1.893

- o Graph density: 0.07

- o Average clustering coefficient: 0.363

- o Modularity (Q) and number of communities: 0.234

- o Betweenness centrality

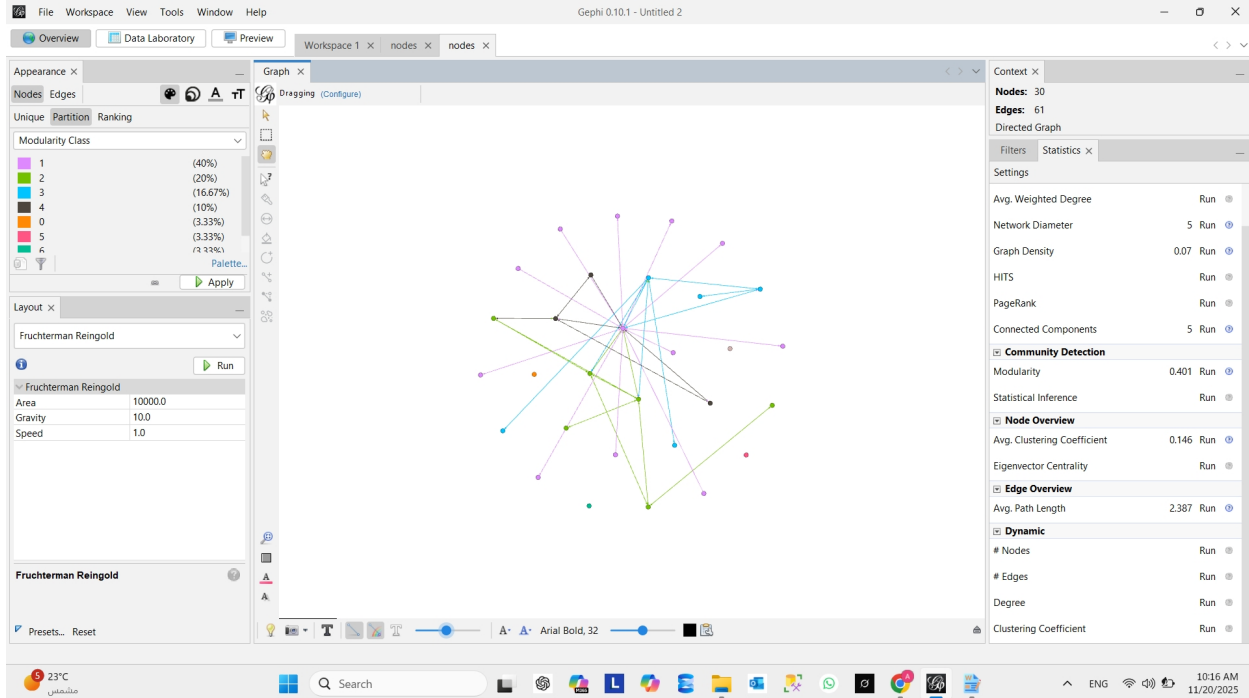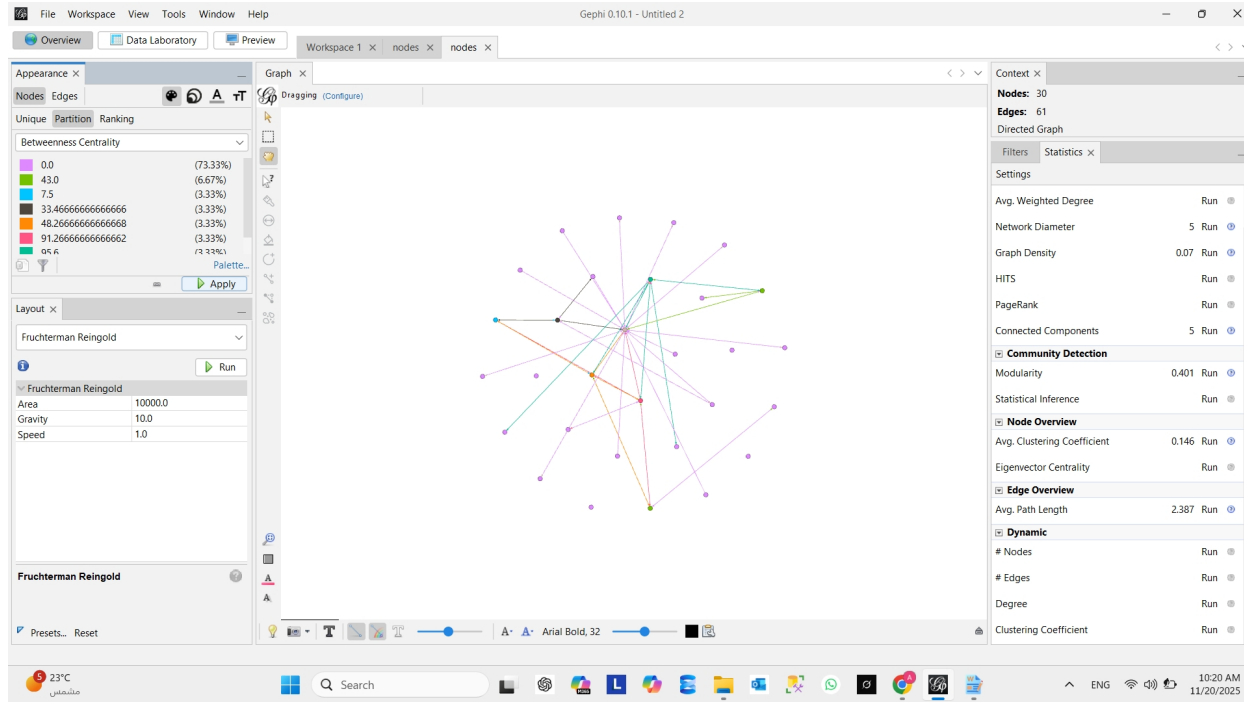o closeness centrality

o Connected components 3

5G_Conspiracy_Graphs

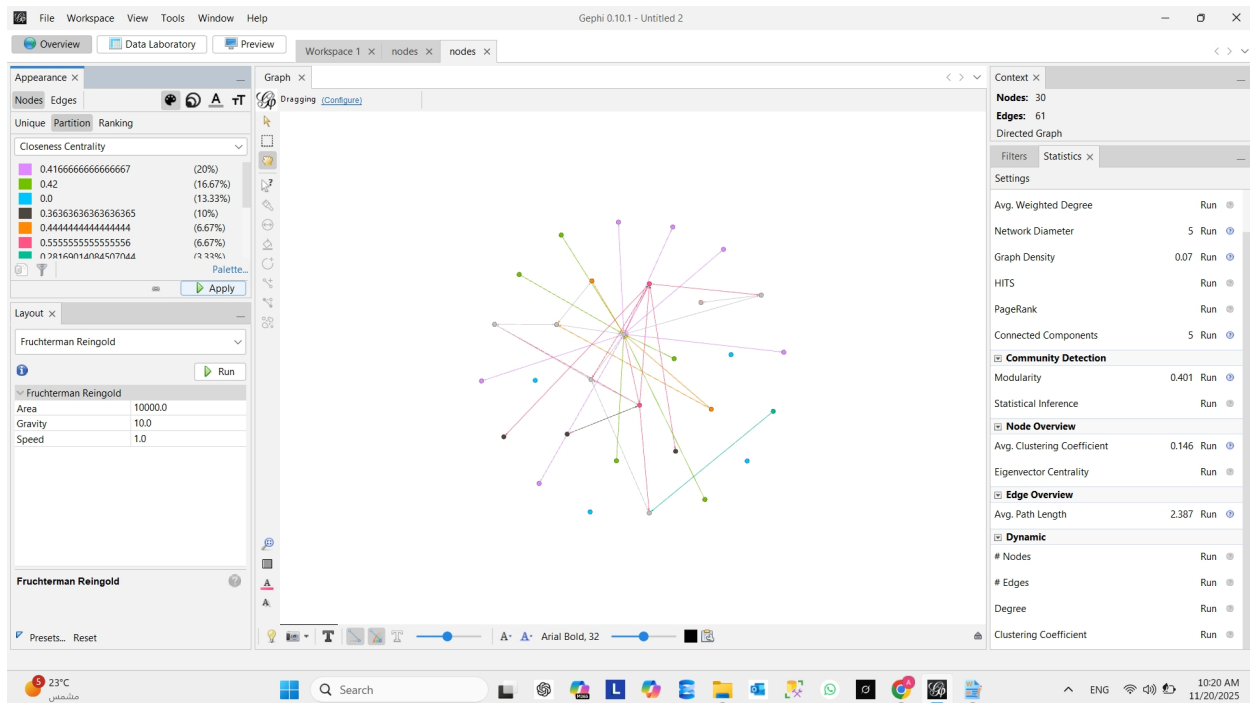Run **Statistics** for the following metrics on **graphs**:

- o Number of nodes and edges: 30 61

- o Average degree:2.033

- o Graph density:0.07

- o Average clustering coefficient:0.146

- o Modularity (Q) and number of communities:0.401

- o Betweenness:

○ **closeness centrality:**

○ Connected components:5

Comparative Social Network Analysis: 5G Conspiracy vs Non-Conspiracy Twitter Subgraphs (WICO Dataset)

1 Analyzed Graphs

Two Twitter interaction subgraphs from the WICO dataset were analyzed in Gephi:

Non-Conspiracy Graph (benign community)

- Nodes: 28

- Edges: 53

5G Conspiracy Graph (misinformation community)

- Nodes: 30

- Edges: 61

Both graphs are nearly identical in size. This allows direct comparison without scale bias. All metrics were generated in Gephi using standard directed-graph settings and ForceAtlas2 layout.

2. Key Network Metrics and Their Interpretation

Metric	Non-Conspiracy	5G Conspiracy	Interpretation
Nodes / Edges	28 / 53	30 / 61	Both graphs have similar size. Conspiracy graph has slightly more activity.
Average Degree	1.893	2.033	Conspiracy users interact with slightly more accounts on average.
Density	0.07	0.07	Both graphs are very sparse. Only a small fraction of possible connections exist.
Clustering Coefficient	0.363	0.146	Large structural difference. Normal graph has stronger local cohesion. Conspiracy graph has weak triadic closure.
Modularity (Q)	0.234	0.401	Conspiracy network is more fragmented into distinct echo chambers.

| Connected Components | 3 | 5 | Conspiracy graph has more isolated pockets with minimal interaction between them. |

3. Meaning of Each Metric (Merged Explanation)

Nodes and Edges

These values show the scale of each graph. Both subgraphs are similar, so structural differences come from behavior, not size.

Average Degree

Shows how many connections each user has on average.
The conspiracy graph is slightly higher, meaning users in the misinformation network interact with more accounts.

Density

Shows how many edges exist out of all possible edges.
Both graphs have the same density (0.07), confirming both are sparse interaction networks.

Clustering Coefficient

Measures how often users form triangles.
The normal community has a much higher value (0.363). This means users tend to know and interact with each other in small, cohesive groups.
The conspiracy graph's low value (0.146) indicates fewer closed triangles and weaker local bonding, consistent with broadcast-style communication.

Modularity

Measures how strongly the network splits into communities.
The conspiracy graph shows much higher modularity (0.401). This indicates multiple clear echo chambers with limited cross-interaction.

Connected Components

Shows how many fully separate parts exist.
The conspiracy graph contains 5 components (vs 3 in normal).
More components mean a more fragmented and less socially integrated structure.

4. Structural Comparison of the Two Networks

Both graphs have similar size and density, yet they produce dramatically different structures:

1. Fragmentation and Echo Chambers

The conspiracy graph has more components and higher modularity.
This reflects a set of isolated groups that rarely interact with each other.
Such fragmentation is a known hallmark of misinformation ecosystems.

2. Weak Local Cohesion

The conspiracy network shows low clustering.
Users in this graph do not form tight circles or mutual connections.
The structure resembles multiple broadcast hubs pushing content to loosely connected audiences.

3. Dependence on Central Spreaders

The conspiracy graph visually displays several star-shaped structures.
This indicates heavy reliance on high-influence accounts for propagation.
If key hubs were removed, the network would collapse quickly.

4. Organic vs Non-Organic Communication

The normal graph shows natural conversational patterns:

- More triangles

- More shared neighbors

- More distributed flow

- Fewer isolated islands

The conspiracy graph behaves more like an information distribution system rather than a true community.

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5. Centrality Patterns (Visual and Ranking Observations)

Although exact numeric tables were not included, visual inspection and Gephi rankings show:

- **Non-Conspiracy Graph**

    o Betweenness is spread across several nodes.

    o Multiple paths exist for information flow.

    o The network is more resilient to node removal.

- **5G Conspiracy Graph**

    o Betweenness and closeness are highly concentrated in a few nodes.

    o These nodes act as bridges between the otherwise isolated components.

    o The network depends on a small number of spreaders.

This difference reflects two different communication styles:

- **Benign graph:** peer-to-peer discussion

- **Conspiracy graph:** top-down broadcasting

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6. Combined Interpretation of All Metrics

Putting all structural evidence together:

- The conspiracy network is **more fragmented**.

- It contains **more distinct communities**.

- It has **weaker local ties**.

- It relies heavily on **a few influential nodes**.

- It forms **multiple echo chambers** rather than a unified community.

- It resembles **broadcast channels**, not conversation circles.

The normal network, in contrast, has:

- Stronger clustering

- Better inter-group links

- More resilient structure

- More naturally formed social communities

Meaning of Each Metric and Direct Interpretation
Nodes and edges
Shows graph size and interaction count.
Both graphs are similar in size.
The conspiracy graph contains slightly more nodes and edges.

Average degree
Shows how many connections each node has on average.
The conspiracy graph is slightly higher.
Users in the misinformation cluster interact with more accounts on average.
Density
Shows how many actual edges exist out of all possible edges.
Both graphs have density 0.07.
Both are sparse.
Clustering coefficient
Measures how often nodes form triangles.
Higher value means stronger local communities.
Normal graph has 0.363.
Conspiracy graph has 0.146.
The normal community has tighter local circles.
The misinformation group has weaker local bonding.
Modularity
Measures how strongly the graph splits into communities.
Higher values mean more separation or echo chambers.
Conspiracy graph has 0.401.
Normal graph has 0.234.
Misinformation network is more fragmented into clusters.
Connected components
Shows how many fully separated parts exist in the graph.
Normal graph has 3 components.
Conspiracy graph has 5 components.
Misinformation network is more broken into isolated pockets.

What These Metrics Suggest About Misinformation vs Normal Networks

• The conspiracy graph shows more fragmentation.
• The conspiracy graph has smaller, separated pockets of users.
• The conspiracy graph has less triadic bonding and fewer close-knit groups.
• The normal graph shows more natural conversational structure with stronger local communities.
• The conspiracy graph forms more echo chambers based on modularity and component count.
• The misinformation cluster contains local pockets that interact inward more than outward.
.

7. Final Conclusion

Although both graphs contain around thirty nodes, the 5G conspiracy network is structurally very different from the normal community:

- It is more modular.

- It is more fragmented.

- It has weaker triadic closure.

- It relies on a few dominant spreaders.

- It contains more isolated echo chambers.

These properties match large-scale findings in misinformation research.
Even on a micro-scale graph, misinformation forms structural patterns that distinguish it from normal social interaction.