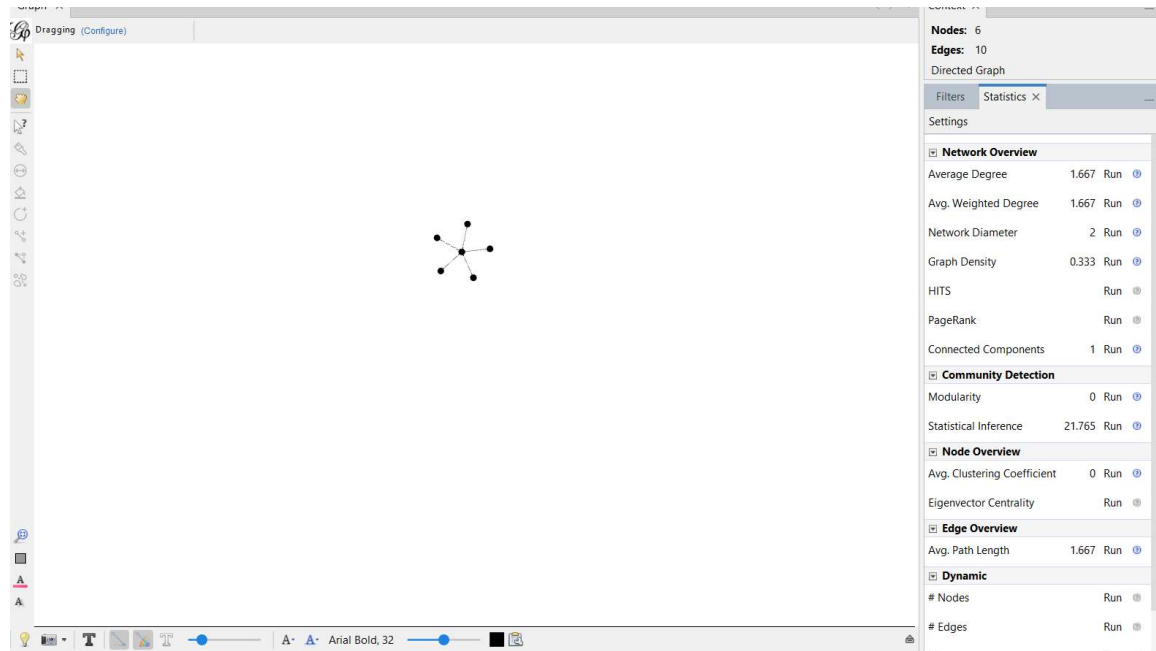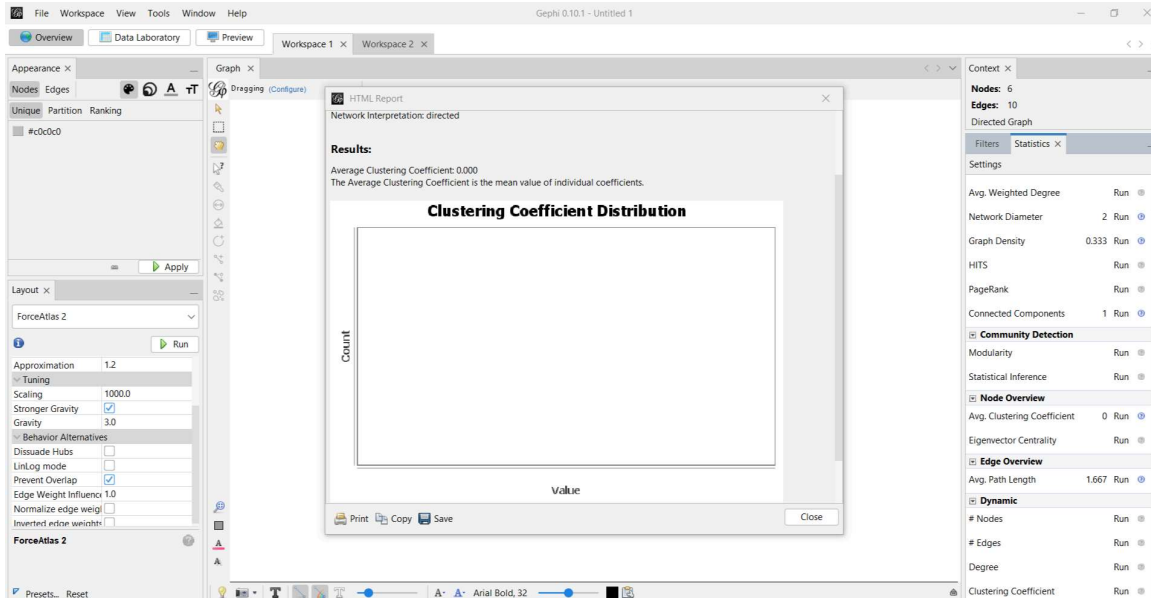Mayssoune Hussein Elmasry   2205251
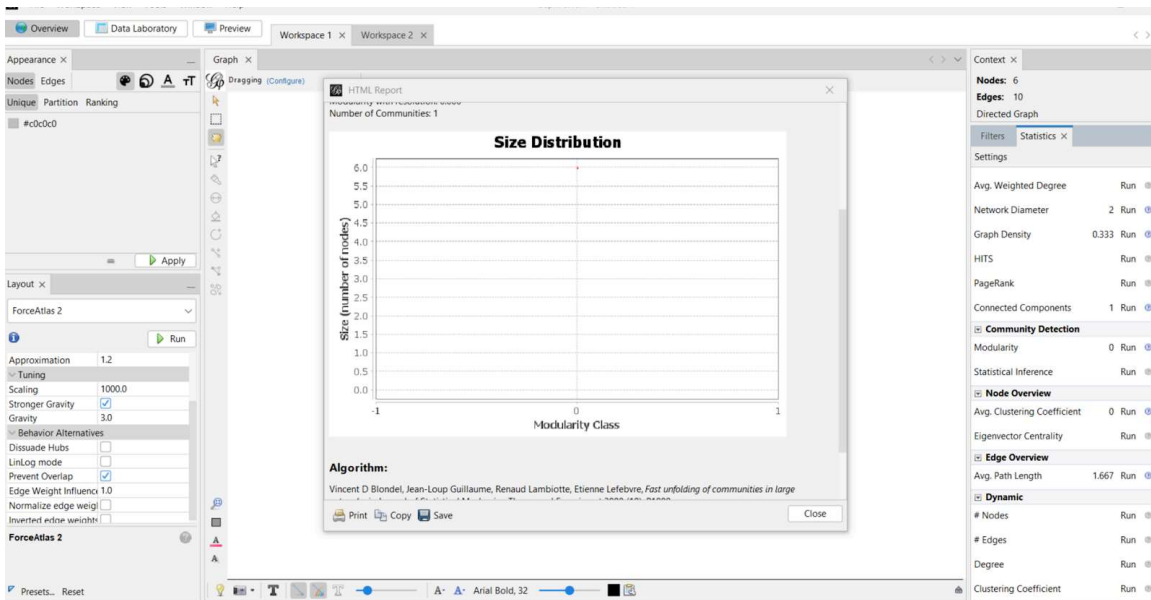
1. Overview of the Two Graphs
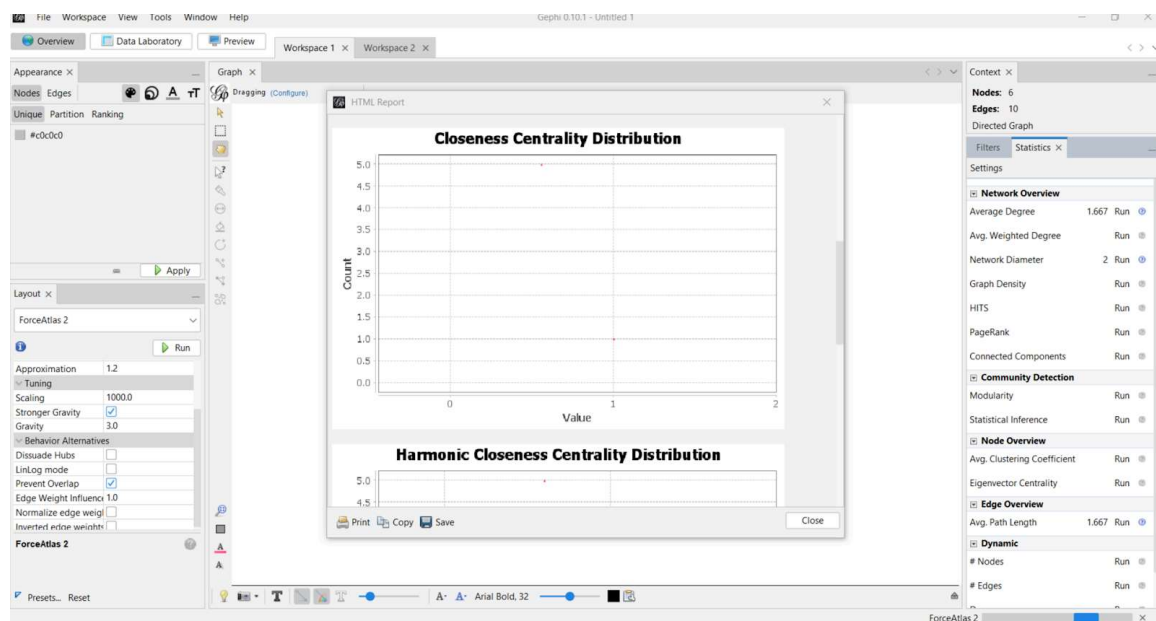
A) 5G Conspiracy Graph

- Nodes: 6

- Edges: 10

- Average degree: 1.67

- Density: 0.333

- Clustering coefficient: 0

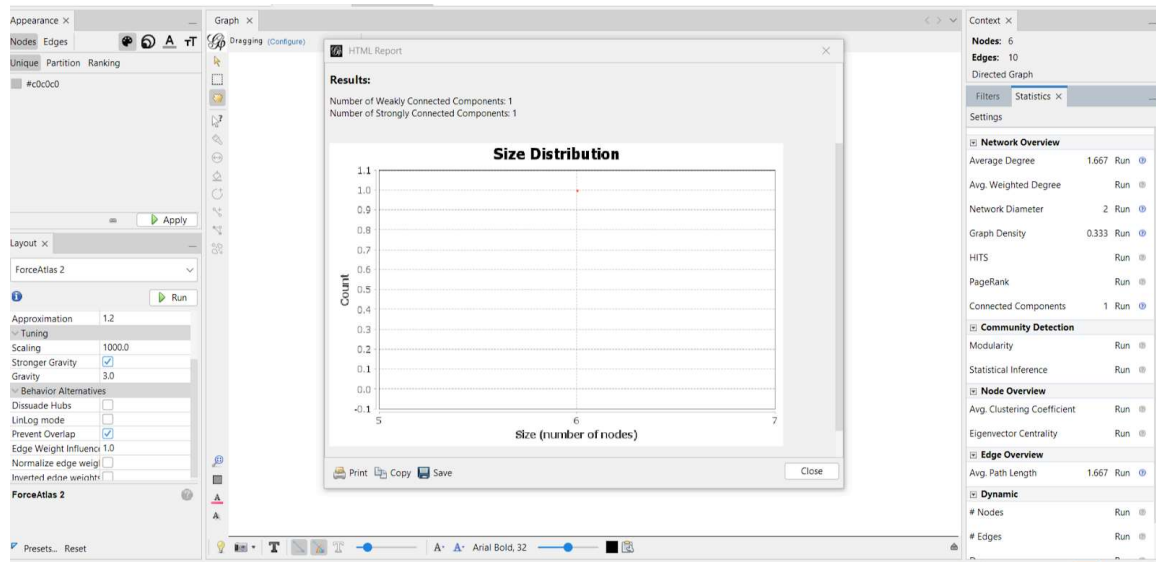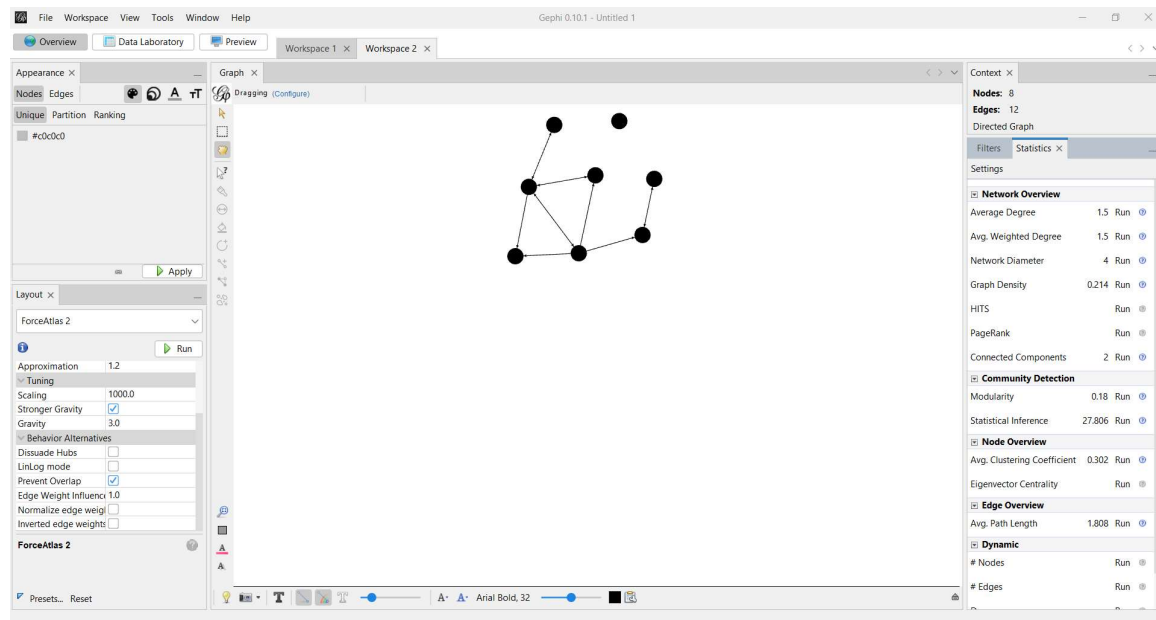- Modularity: 0

- Diameter: 2

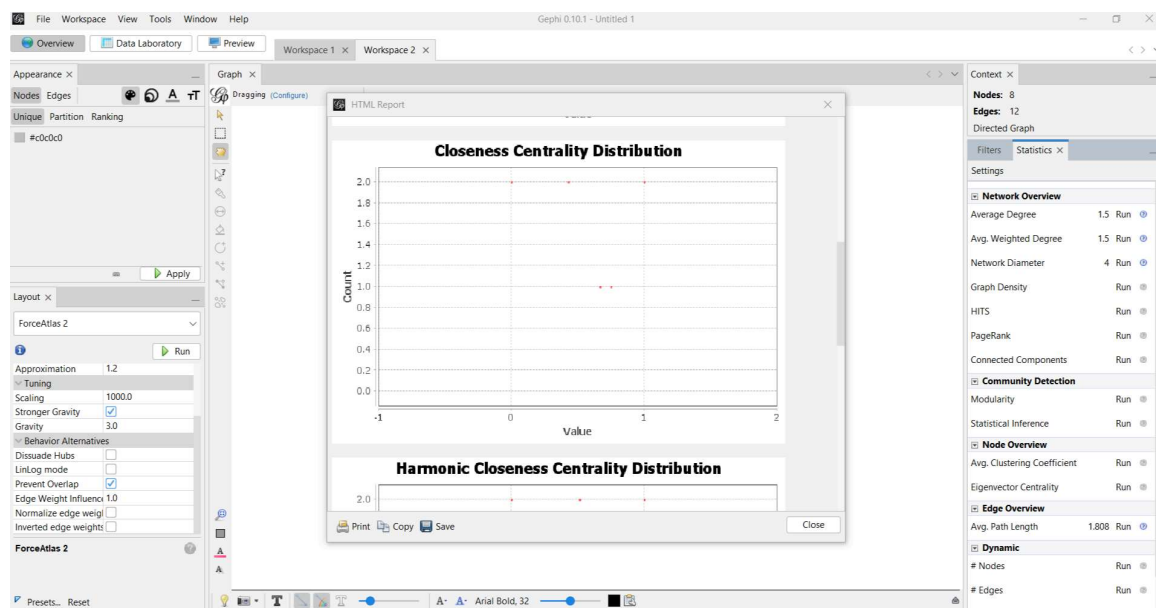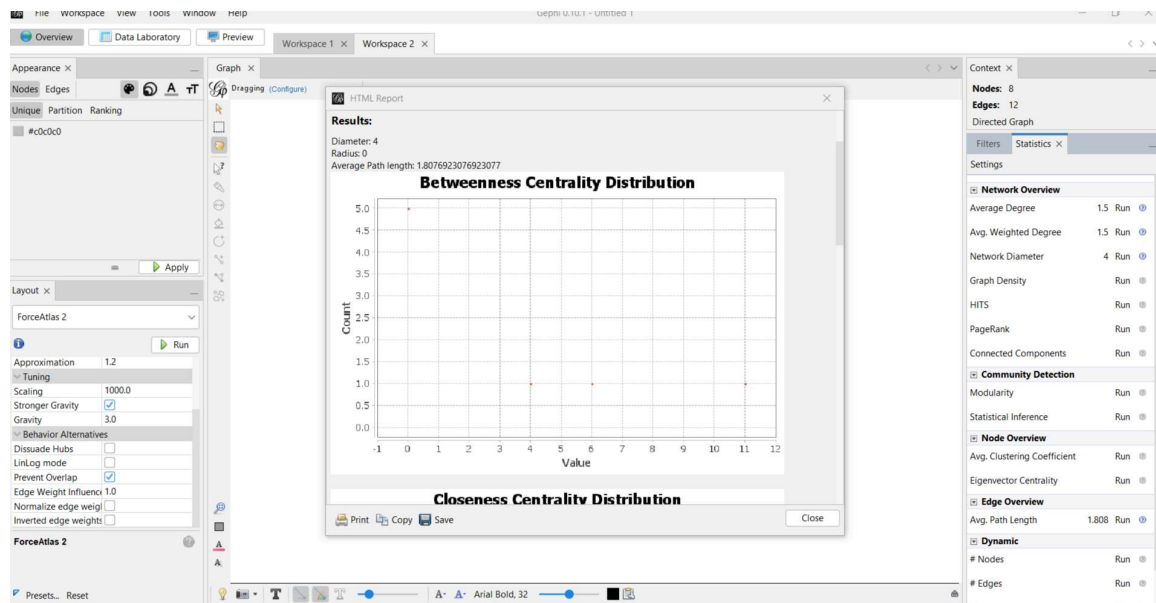- Connected components: 1

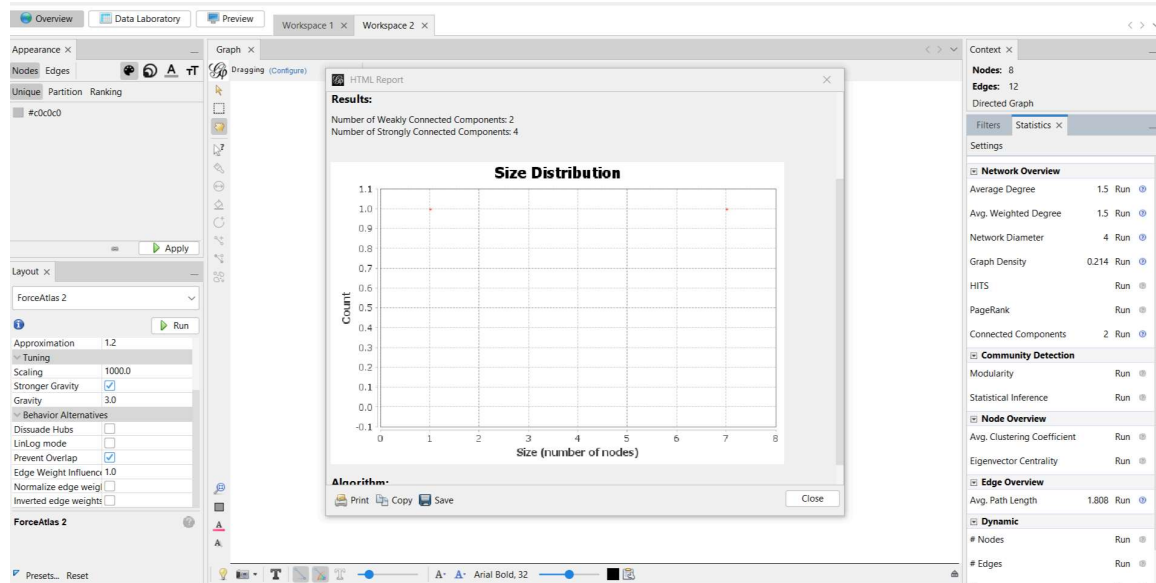## B) Non-Conspiracy Graph

- Nodes: 8

- Edges: 12

- Average degree: 1.5

- Density: 0.214

- Clustering coefficient: 0.302

- Modularity: 0.18

- Diameter: 4

- Connected components: 2

- Average path length: 1.808

2. What the 5G Conspiracy Graph Looks Like

This graph is very centralized. Almost all the nodes connect to one main central node, forming something similar to a star shape.

What this means:

- The central node controls most of the communication.

- Messages can spread very quickly because the diameter is only 2.

- Users around the center do not interact with each other (clustering = 0).

- The network has no communities (modularity = 0), so it is basically one group with one leader.

This structure often appears in coordinated misinformation campaigns.

3. What the Non-Conspiracy Graph Looks Like

The non-conspiracy graph looks more natural and less centralized.

Key observations:

- There are small clusters where users talk to each other (clustering coefficient = 0.302).

- The network is divided into two components.

- The modularity score (0.18) shows some community structure.

- The diameter (4) is larger, meaning messages take more steps to reach everyone.

4. Comparing Both Graphs

Structure:

- 5G graph: One central hub.

- Normal graph: Several small clusters.

Spread of Information:

- 5G graph: Very fast spread.

- Normal graph: Slower spread.

Interaction Between Users:

- 5G graph: Almost no interaction between outer nodes.

- Normal graph: Some natural group interactions.

Communities:

- 5G graph: No communities.

- Normal graph: At least 2 communities.

Connectedness:

- 5G graph: One full component.

- Normal graph: Two components.

5. Security Interpretation

A) 5G Conspiracy Graph (35)

- Highly dependent on the central node.

- Can spread misinformation extremely quickly.

- Easy to detect and disrupt by targeting the main hub.

- Matches suspicious or coordinated activity patterns.

B) Non-Conspiracy Graph (35)

- More natural communication.

- Slower spreading.

- Less suspicious structure.

- Harder to detect issues because the pattern is normal.

6. Conclusion

The 5G conspiracy graph is centralized and behaves like a coordinated misinformation network. The normal graph is more balanced, community-based, and spreads information more slowly. These structural differences help explain why misinformation networks act more aggressively and are easier to detect.