**BMI4150 Introduction to Social Network Analysis**
Project Document

**Project Team Information**
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**Title:** Social Network Analysis of Skyrim

**Description:** This project conducts a Social Network Analysis (SNA) on Skyrim, a country within the fictional universe of Elder Scrolls. The analysis explores the social relationships and interactions among characters in the game.

**Dataset Source:**
The dataset was compiled using information from the Unofficial Elder Scrolls Pages.
Credit to the Elder Scrolls Pages for providing valuable data:
https://en.uesp.net/wiki/Skyrim:People

**Graph Description:** Each node represents a unique character in the game. Edges denote the acquaintance relationship between two characters.

**Graph Type:**
- Unweighted
- Bidirectional
- Unsigned
- Homogenous

**Network Dimensions:**
- Number of Nodes: 1027
- Number of Edges: 2808
- Diameter: 11
- Average Path Length: 4.5429

**Degree Centralities:**
Most Popular 5 People and Their Degrees:
1. ('Jarl Ulfric Stormcloak', 95)
2. ('Maven Black-Briar', 55)
3. ('General Tullius', 43)
4. ('Jarl Balgruuf the Greater', 38)
5. ('Thonar Silver-Blood', 36)

**Maximum Betweenness Centrality:**
- Jarl Ulfric Stormcloak

**Average Network Measures:**
- Average Clustering Coefficient: 0.3876

- This suggests a moderate tendency for nodes in the network to form clusters with their neighbors. Which indicates the presence of communities or groups of characters with interconnected relationships.

- Edge Density: 0.0053
  - Signifies a sparse network where only a small fraction of possible connections among nodes are realised.

- Average Closeness Centrality: 0.2728
  - This indicates that, on average, nodes in the network are relatively close to each other.

- Average Degree Centrality: 0.0370
  - This suggests that nodes in the network exhibit a relatively low degree of connectivity. This implies that, on average, characters in Skyrim do not have an extensive number of acquaintances.

- Average Shortest Path: 4.5429
  - Represents the typical minimum number of steps required to navigate from one node to any other in the network.

- Small-World Coefficient: 0.0779
  - This indicates a degree of small-worldness in the network. Which suggests that the social network in Skyrim possesses characteristics of both local clustering and short average path lengths.

- Network Diameter: 11
  This indicates that in the worst-case scenario, it takes a maximum of 11 steps to navigate from one character to another in the network.

**Structural Similarity**

- Jaccard Similarity between Jarl Balgruuf the Greater and Jarl Igmund: 0.0851

**Conclusion**

This Social Network Analysis of Skyrim reveals intricate social structures within the game. The power-law distribution of degrees, small world and the moderate clustering coefficient are indicative of a diverse social network. The nodes with the highest degrees are powerful figures in Skyrim, such as the rebellion leader, head of powerful families, generals, and Jarls. The degree distribution suggests that powerful characters have more acquaintances than less powerful ones.

**Potential For Future Expansion:**

Dataset can be expanded to include more details for the characters like their ideologies and which side of the conflict they are in and the relations between them can be categorised as adversary or ally. If these changes are implemented, more information can be extracted from the analysis.