Project Title:

"Social Network Analysis of Influencers: Leveraging AI to Identify Key Players and Predict Influence Dynamics"

Project Overview:

This group project will explore the role of influencers in social networks by conducting a social network analysis (SNA) to identify key influencers, their connections, and the dynamics of their influence. The project will incorporate AI techniques to enhance the analysis, such as predicting the future influence of influencers and recommending strategies for targeted engagement.

Tasks:

1. **Data Collection:**
    - Gather data from various social media platforms (such as Instagram, Twitter, or YouTube) to analyze influencer activity. This could include follower count, engagement rates (likes, comments, shares), and the content of posts.
    - Use social media APIs (such as Twitter API, Instagram Graph API, etc.) or public datasets available for influencer data.
2. **Social Network Construction:**
    - Construct a social network graph where influencers are nodes and interactions (e.g., mentions, follows, collaborations) between them are edges.
    - Represent influencers with attributes such as follower count, engagement rate, and topics of influence.
3. **Social Network Analysis:**
    - Perform various SNA techniques to identify key influencers within the network (e.g., using centrality measures like degree centrality, betweenness centrality, and closeness centrality).
    - Investigate community structures within the influencer network (i.e., clustering influencers into different groups based on their interactions).
4. **Influence Prediction with AI:**

- Use machine learning models (such as regression, decision trees, or neural networks) to predict the future influence of influencers based on historical data.
- Develop a model to recommend strategies for boosting an influencer's engagement (e.g., optimal posting times, best types of content to post).
- Experiment with AI techniques such as Natural Language Processing (NLP) to analyze the text content of influencers' posts to understand sentiment, topics, or engagement drivers.

5. **Visualization:**
    - Create visualizations of the social network, highlighting key influencers, communities, and interactions. Use network graphs (e.g., using libraries like NetworkX, Gephi, or Plotly).
    - Visualize AI predictions, such as the predicted future influence or engagement trends.
6. **Reporting and Presentation:**
    - Summarize the findings, including key influencers, their impact, and how AI can predict or enhance social influence.
    - Present the results with interactive graphs, predictive models, and strategic recommendations for influencers and brands. Can use Streamlit/Dash.
7. **Challenges and Future Work:**
    - Discuss challenges faced during the project, such as data quality, scalability, or AI model limitations.
    - Suggest possible future improvements, such as real-time analysis or deeper NLP models for sentiment analysis of influencer content.