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WhatsApp Group Chat Analysis Using Python

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Abstract: WhatsApp group chats generate vast amounts of unstructured data, offering insights into communication patterns, sentiment trends, and user behavior. This paper presents a Python-based analytical framework for processing and visualizing WhatsApp group chat data, tailored for government organizations. The system employs Natural Language Processing (NLP) and machine learning techniques to perform sentiment analysis, topic modeling, language detection, and emoji analysis. Leveraging libraries such as pandas, matplotlib, seaborn, and Streamlit, the tool provides an interactive web interface for real-time insights. Key outcomes include identifying active participants, sentiment distribution, and multilingual support. The system addresses challenges like data privacy, scalability, and multilingual variability, offering a resource-efficient solution for large datasets. Performance evaluation highlights high accuracy in sentiment classification (F1-score: 0.89) and efficient processing of 50,000+ messages. This work enhances transparency in governance by enabling data-driven decision-making.

Keywords: Group Chat Data, Pandas, Seaborn, Matplotlib, Regex, Counter, WordCloud, StopWords, Sentiment, Language detection, Emoji, NLTK, Streamlit, etc



