Report: Topic-based Post-Recommendation System

Introduction:

The primary goal of this project is to meticulously design and implement a highly functional topic-based post recommendation system leveraging the capabilities of state-of-the-art Generative AI. This report offers a comprehensive overview of the methodology employed, encompassing user and post profiling, coupled with the evaluation metrics utilized to gauge the system's performance accurately.

Methodology:

2.1 User and Post Profiling:

In order to gain valuable insights into user preferences, an intricate process of tokenization and analysis was carried out on user posts, harnessing the power of cutting-edge Generative AI models. The same models were then employed for post profiling, delving into the intricate details of the topics embedded within each post. The extracted user and post topics formed the basis for the creation of user-topic and post-topic matrices.

Recommendation Engine:

3.1 User-Post Matrix Creation:

The creation of user-topic and post-topic matrices was a pivotal step in the recommendation engine's architecture. These matrices, rooted in the identified topics during profiling, facilitated the use of cosine similarity to measure the likeness between user and post topics. The subsequent extraction of top recommendations was executed by selecting posts exhibiting the highest similarity to each user.

Evaluation Metrics:

To measure the system's accuracy and relevance, precision, recall, and F1 score were adopted as robust evaluation metrics. The ground truth data was meticulously defined, allowing for a thorough comparison against the system's predictions and thereby facilitating the precise calculation of these metrics.

Results:

The evaluation metrics yielded promising results, underscoring the system's efficacy in furnishing accurate and pertinent recommendations. While the current iteration showcases commendable performance, avenues for further enhancements and optimizations were identified, laying the groundwork for future iterations to push the boundaries of system effectiveness.

Code and Resources:

A comprehensive suite of code has been developed for this task, encompassing intricate aspects such as user and post profiling, the recommendation engine, and the implementation of evaluation metrics. Key libraries such as scikit-learn, NumPy, and the Generative AI model library played pivotal roles in realizing the system's robust functionality.

Demo:

A succinct yet insightful screen recording has been thoughtfully included to provide a visual demonstration of the Topic-based Post Recommendation System. The demo encapsulates the system's seamless processing of posts, adept user profiling, and the generation of recommendations, offering a firsthand experience of its capabilities.

Conclusion:

In conclusion, the developed system stands as a testament to the transformative potential of Generative AI in crafting a highly effective topic-based post recommendation system. The report concludes with reflective insights into the system's performance, paving the way for future enhancements that promise to elevate its capabilities to new heights.