GENERATIVE AI RECOMMENDER SYSTEM IN E-COMMERCE

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Project Objectives

1) To explore various Generative AI in recommendation system

2) To design and implement the selected Generative AI

3) To evaluate the algorithm through user testing or performance evaluation

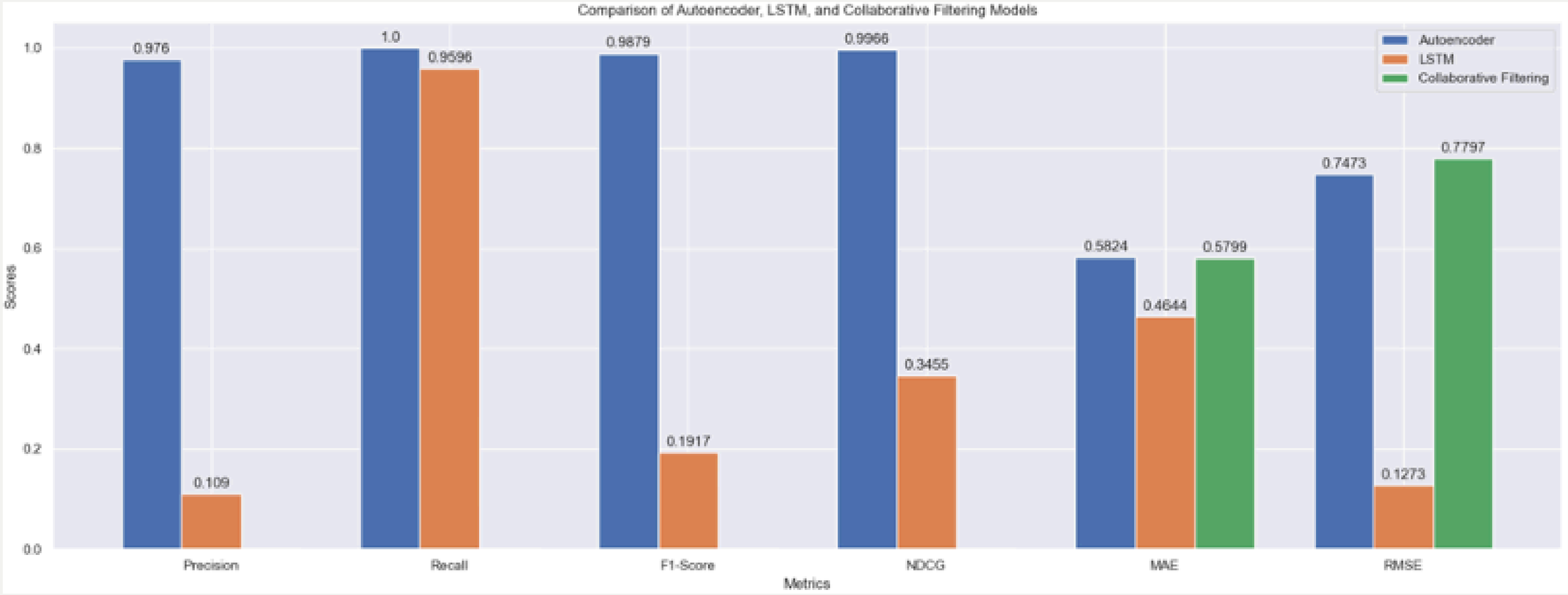
Project Findings

Successfully trained generative AI models which are Autoencoder and LSTM, result achieved better performance compared to using traditional method in recommendation system. Evaluate using MAE, RMSE, Similarity Score, Precision, Recall, F1-Score & NDCG.

Brief Comparison among generative models

Feature	LSTM	Autoencoder
Purpose	Sequence prediction and generation	Data compression and reconstruction
Use Case in Recommendation	Predicting next items in a sequence (e.g., next movie)	Learning latent representations of user-item interactions
Data Handling	Works well with sequential data	Works well with high-dimensional data
Model Structure	Recurrent Neural Network (RNN)	Encoder-Decoder network
Input Type	Time series or sequence data	High-dimensional vectors
Training Complexity	Moderate to High (due to sequential nature)	Moderate (depending on depth and size)
Output	Next item or sequence of items	Reconstructed input or latent features

Evaluation Metrics Result



Model	Collaborative Filtering (SVD)	Autoencoder (AE)	Long short-term memory (LSTM)
MAE	0.5799	0.5824	0.4644
RMSE	0.7797	0.7473	0.1273
Precision	-	0.976	0.109
Recall	-	1.0	0.9596
F1-Score	-	0.9879	0.1917
NDCG	-	0.9906	0.3455

Conclusion & Future Work

The recommendation system's implementation has improved significantly by using selected generative AI compared to traditional method. Result obtained also highly impressive by using few of evaluation metrics and the implementation of user interface prototype are done using streamlit. Upcoming projects will concentrate on integrating real-time data, investigating more AI methods, such as GANs and VAEs. Priorities include improving the user interface, taking user comments, and making sure that security and scalability are met. The system will be further refined through robust implementation, collaborative research, and cross-domain suggestions.

Project Demonstration

How to use Product Recommendation System

Open terminal

Write : streamlit run /Users/anisnabila/Developer/FYP/FYP_code/testvae.py

Prompt desired USER ID = 1-32

Sytem will show previous purchase for user ID and the TOP Recommendation