Chat Reply Recommendation System

This project implements a Chat Reply Recommendation System using GPT-2 transformer model and a single dataset. The goal of this system is to predict the next likely response in a conversation, given a user's previous message. It helps simulate realistic chatbot replies or automate conversational responses.

Objectives: To preprocess and clean conversational data for model training. To fine-tune GPT-2 model on a single dataset containing user messages. To generate contextually relevant replies to user inputs. To evaluate the model performance using BLEU score.

Methodology: Data Loading: Load chat dataset using Pandas (Excel/CSV format). **Data Cleaning:** Remove missing values and strip extra spaces. **Conversation Pair Creation:** Pair each user message with the next reply in sequence. **Model Setup:** Load GPT-2 model and tokenizer from Hugging Face Transformers. **Training:** Train model on message-reply pairs using AdamW optimizer. **Evaluation:** Measure model performance using BLEU score. **Prediction:** Generate reply for new user message using the trained model.

Results:
The model was able to learn message-response patterns and generate meaningful replies for simple conversations. The training process successfully completed with a stable loss reduction, and the final BLEU score indicated good linguistic relevance between actual and generated responses.

Conclusion:
This Chat Reply Recommendation System demonstrates how GPT-2 can be fine-tuned on chat data to produce realistic replies. With further improvements and larger datasets, it can be used for chatbots, virtual assistants, or conversational AI systems.

Technology	Purpose
Python	Core programming language
Pandas	Data loading and preprocessing
Transformers (Hugging Face)	Model training and generation
Torch	Model optimization
BLEU Score	Evaluation metric