Offline Chat-Reply Recommendation System using Transformers

Problem Statement

Predict the next reply of User A based on previous conversation with User B.

Objective

Build an offline Transformer-based chat recommendation system.

Dataset

Two CSV datasets of two-person conversations with columns: conversation_id, user, timestamp, message.

Methodology

Merge conversations, tokenize with GPT-2 tokenizer, fine-tune GPT-2 model, and generate context-aware replies.

Model Choice Justification

GPT-2 chosen for natural language generation capability and offline fine-tuning support.

Implementation Steps

1. Load dataset
2. Merge conversations
3. Tokenize
4. Create Dataset class
5. Fine-tune GPT-2
6. Generate replies
7. Evaluate responses

Evaluation Metrics

BLEU for word overlap, ROUGE for summary similarity, Perplexity for model confidence.

Results & Example

Sample conversation, predicted reply, BLEU & ROUGE scores.

Conclusion

Model generates context-aware replies offline efficiently.

References

HuggingFace Transformers documentation, NLTK & Rouge-score documentation