

AI-Powered Language Learning Chatbot

Overview

Our AI-powered language learning chatbot is designed to help users improve their language skills through interactive conversations, real-time corrections, and mistake tracking. This application provides a personalized learning experience using advanced AI models and a structured conversation approach.

Key Features

- **Interactive Learning:** Users engage in real-life conversational scenarios to practice their target language.
- **AI-Powered Correction:** The chatbot detects and corrects language mistakes, providing explanations.
- **Proficiency-Based Scenes:** Users choose scenarios based on their skill level (Beginner, Intermediate, Advanced).
- **Mistake Tracking:** Stores user errors in a database for review and learning improvement.
- **Streamlit-Based UI:** A simple and engaging web interface for seamless interaction.

Technology Stack

- **Frontend:** Streamlit for user interaction.
- **Backend:** Python with SQLite for data storage.
- **AI Model:** Groq-powered LLM (deepseek-r1-distill-llama-70b) for language correction and response generation. I used it because my openAi api is exhausted.
- **Data Processing:** LangChain for prompt structuring and interaction.

System Architecture

The system follows a modular architecture with the following components:

1. **User Interface (Frontend)**
 - Built using Streamlit to provide an intuitive and simple web-based UI.
 - Users input their language selection, proficiency level, and engage in conversations.
 2. **AI Processing Layer**
 - Groq API (deepseek-r1-distill-llama-70b) is used to generate AI-driven responses and language corrections.
 - LangChain structures the interaction by managing prompts and responses.
 3. **Database (SQLite)**
 - A lightweight SQLite database stores user mistakes and corrections for tracking progress.
 - Schema includes fields for user input, detected mistakes, corrections, and timestamps.
 4. **Backend Logic**
 - Handles user session management to maintain conversation history.
 - Integrates AI model calls for generating responses and corrections.
 - Processes feedback and mistake tracking for review and improvement.
 5. **Error Handling & Review System**
 - The system detects grammatical errors, vocabulary mistakes, and improper sentence structuring.
 - Users can review past mistakes and receive focused feedback on improvement areas.
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Workflow

1. User Setup

- Users enter their target and native languages.
- They select their proficiency level.

2. Scenario Selection

- Users choose a real-life scenario to practice conversation.

3. Interactive Conversation

- The chatbot engages in a dialogue based on the chosen scene.
- AI generates responses in the target language.
- Mistakes are identified, corrected, and stored in the database.

4. Review & Feedback

- Users can review their mistakes with explanations.
 - Personalized feedback helps them focus on improvement areas.
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Database Structure

A SQLite database (language_mistakes.db) stores:

- User Input: The original sentence from the user.
 - Mistake: Detected errors.
 - Correction: The AI's suggested correction.
 - Timestamp: Time of entry for tracking progress.
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Business Value

This chatbot can be integrated into:

- EdTech platforms for personalized language training.
- Corporate training for business communication improvement.
- E-learning apps for interactive language practice.

By leveraging AI-driven feedback, users can enhance their fluency, grammar, and confidence in real-world language usage.

Conclusion

Our AI-powered language learning chatbot provides an innovative, engaging, and effective way to master a new language. With real-time corrections, proficiency-based scenarios, and mistake tracking, it ensures users get personalized feedback and a structured learning experience.