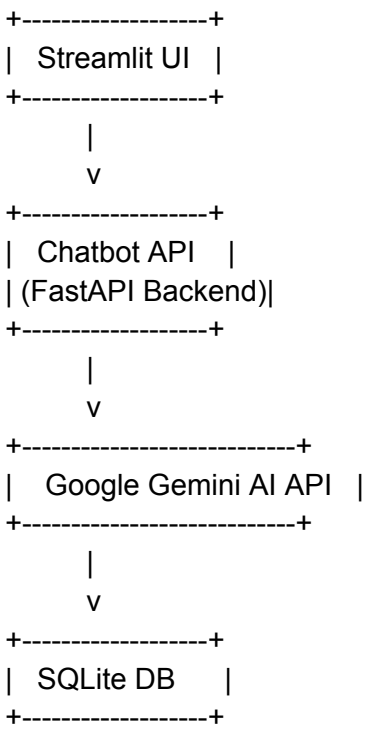
AI-Powered Language Learning Chatbot - Detailed Documentation

1. Introduction

The AI-Powered Language Learning Chatbot is an interactive tool designed to help users practice and improve their language skills. By engaging users in real-world conversational scenarios, the chatbot detects grammatical mistakes, provides corrections, and explains errors in a friendly and educational manner.

2. System Architecture

2.1 Architecture Diagram



2.2 Explanation of Components

- **Streamlit UI**: The front-end interface where users interact with the chatbot.
- **Chatbot API**: Uses LangChain and Google Gemini AI to process user input, detect mistakes, and generate corrected responses.

- **Google Gemini AI**: Handles natural language understanding and generation, providing feedback on grammatical mistakes.
- **SQLite Database**: Stores user mistakes for review and future improvement.

3. Requirements

3.1 Software Requirements

- Python 3.10+
- Streamlit
- LangChain
- SQLite3
- dotenv
- Google Gemini AI API Key

3.2 Installation and Setup

Step 1: Clone the Repository

git clone https://github.com/dveersingh/AI_language_chatbot.git
cd AI_language_chatbot

Step 2: Install Dependencies

pip install -r requirements.txt

Step 3: Configure API Key

For Local Setup

Create a `.env` file in the root directory and add your API key:

GOOGLE_API_KEY=your_actual_api_key

1.

Alternatively, set the environment variable manually:

export GOOGLE_API_KEY=your_actual_api_key

Or on Windows (PowerShell):

$env:GOOGLE_API_KEY="your_actual_api_key"

2.

For Streamlit Community Cloud Deployment

Create a `secrets.toml` file inside the `.streamlit` directory:

[general]
GOOGLE_API_KEY = "your_actual_api_key"

1.

Alternatively, go to **App Settings** → **Advanced Settings** → **Secrets** in Streamlit Cloud and add:

GOOGLE_API_KEY = your_actual_api_key

2.
3. Click **Save**.

Step 4: Run the Chatbot

streamlit run app.py

4. Features

- **Scenario-based learning**: Provides real-world situations to improve conversational skills.
- **Grammar correction**: Detects and explains grammatical errors in user responses.
- **Mistake tracking**: Stores user mistakes for future reference and learning.
- **Multi-language support**: Supports multiple languages for learners of different backgrounds.
- **Interactive learning**: Engages users in an AI-driven conversation to simulate real-world interactions.

5. Deployment Guide (Streamlit Cloud)

1. Push your project to GitHub.

2. Go to Streamlit Community Cloud.
3. Click on **New App** → Select your GitHub repository.
4. Under **Advanced Settings**, add the required API key under **Secrets**.
5. Click **Deploy**.
6. Your chatbot is now live!

6. Future Improvements

- **User Authentication**: Implement user accounts for personalized learning progress.
- **Speech Recognition**: Enable users to practice spoken language skills.
- **Adaptive Learning**: Adjust difficulty based on user performance.
- **Additional Language Support**: Expand the range of supported languages.

7. Conclusion

The AI-Powered Language Learning Chatbot is a valuable tool for language learners. By integrating advanced AI with interactive learning techniques, it enhances user engagement and accelerates language proficiency.