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LANGUAGE LEARNING WEB APPLICATION

Sushma S[1], Saranyasree R[2],Safrin Farjana M[3],Vishnupriya N[4]

[1234] Sri Shakthi Institute Of Engineering & Technology,(Anna University Affiliated),Coimbatore, Tamil Nadu, India

ABSTRACT :

This project involves developing an AI-powered language learning web applicatoin that helps users improve their speaking, listening, reading, and grammar skills. It uses speech recognition, NLP, and adaptive learning to provide personalized lessons, real-time feedback, and progress tracking. Gamification and spaced repetition techniques are used to enhance engagement and retention, making language learning more effective and enjoyable.

KEYWORDS : Grammer Practice, Vocabulary Builder, Speech Recognition, Language Learning

INTRODUCTION

The Language Learning Web Application is designed to help users develop proficiency in a new language through interactive, AI-powered tools. The app combines modern technology such as speech recognition, real-time feedback, and adaptive learning paths to create a personalized and engaging experience. It focuses on improving listening, speaking, reading, and writing skills, making language acquisition more effective and accessible for learners of all levels.

METHODOLOGY

The proposed system consists of four main modules:
Speech Recognition Module:
Utilizes pre-trained models such as Google Speech-to-Text or Whisper (OpenAI) to convert spoken input into text with high accuracy. This helps users practice pronunciation and speaking skills.
Grammar and Vocabulary Correction:
Leverages transformer-based models (e.g., BERT or prithivida/grammar_error_correcter_v1) and spaCy for detecting and correcting grammatical errors and suggesting better vocabulary choices in real-time.
Adaptive Learning Engine:
Implements a feedback loop based on user performance. Machine learning algorithms adjust the difficulty level and suggest personalized lessons or quizzes to enhance retention and learning efficiency.
Frontend Interface:
Built with Streamlit or Flutter, the UI allows users to interact with the system through voice or text input, view corrections, access exercises, and track progress. It supports real-time feedback and multilingual support.

3.MODELING AND ANALYSIS

The Language Learning Web Application is modeled as a modular system, integrating speech, text, and grammar technologies to enhance language acquisition. The system workflow is designed around real-time input analysis and feedback loops to personalize the learning experience. The core modules and their roles are as follows:

Input Modeling:

- Accepts both voice and text input from the user.
- Voice input is processed using Automatic Speech Recognition (ASR) systems like Whisper or Google Speech-to-Text.
- Text input is accepted directly through the user interface.

Natural Language Processing (NLP) Pipeline:

- Tokenization and POS Tagging: Using spaCy to break down sentences and analyze grammar structure.
- Grammar and Spell Correction: Transformer-based models and SymSpell are used to correct errors and enhance the text.

Feedback and Adaptation Module:

- User performance is tracked based on correct and incorrect submissions.
- A scoring system is used to evaluate proficiency in areas like vocabulary, grammar, and pronunciation.
- The app recommends exercises and adjusts difficulty using a basic rule-based or machine learning model.

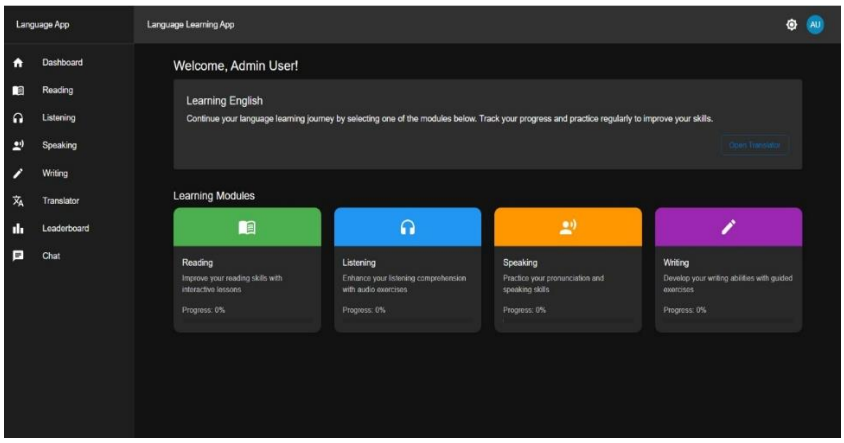
Interface and User Interaction:

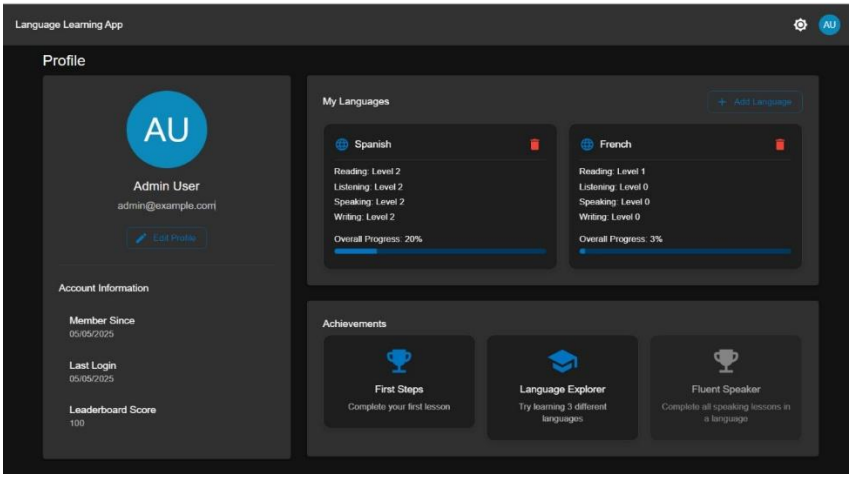
- Developed using Streamlit or Flutter.
- Supports image uploads (for OCR), speech input, and real-time feedback display.
- Allows users to download corrected texts or track learning history.

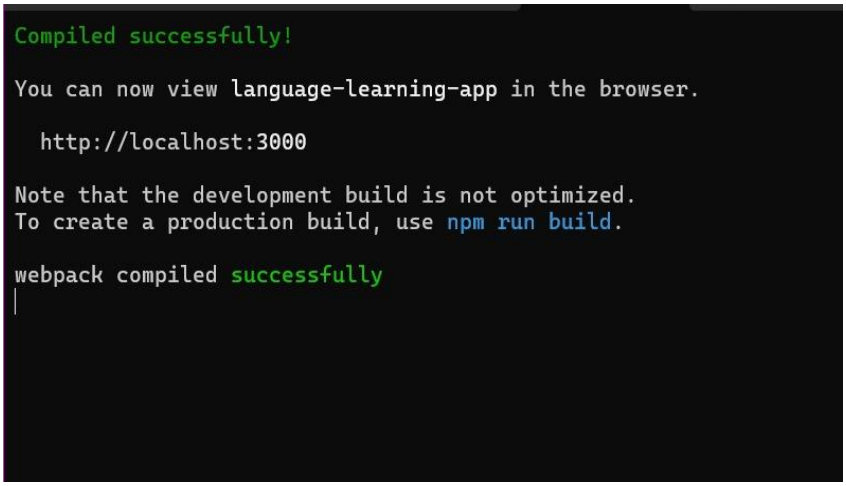
System Analysis:

- Efficiency: Real-time processing of voice and text ensures fast feedback.
- Accuracy: Pretrained NLP models enhance the precision of corrections.
- Scalability: Modular design supports easy integration of additional languages or learning modules.
- User-Centric Design: Personalized feedback loop makes the app suitable for learners of varying proficiency levels.

RESULT AND DISCUSSION SCREENSHOTS:







CONCLUSION

The Language Learning Web Application is a user-friendly and interactive platform designed to help users learn new languages effectively. It combines modern technologies like React, Flask, and MongoDB to deliver lessons, exercises, progress tracking, and features like text-to-speech and chat support. The app provides a smooth learning experience through its well-structured design and responsive interface. With its scalable architecture, it is also ready for future improvements such as speech recognition and AI-based learning suggestions, making it a valuable tool for learners of all levels.

REFERENCES :

1. Vaswani et al., "Attention Is All You Need," NeurIPS, 2017.
2. Radford et al., "Language Models are Unsupervised Multitask Learners," OpenAI, 2019.
3. Baevski et al., "wav2vec 2.0: A Framework for Self-Supervised Learning of Speech Representations," arXiv, 2020.
4. Vasquez & Petrenko, "Mobile Language Learning: A Practical Guide to Implementation," JETS, 2020.
5. Hochreiter & Schmidhuber, "Long Short-Term Memory," Neural Computation, 1997.
6. Google Developers, "Speech-to-Text API Documentation," 2023.
7. UX Design Institute, "Best Practices in UI/UX for Educational Apps," 2022.