

Language Learning Prototype: Etymology-Powered Assistant

Utility of the Prototype

This Streamlit-based prototype helps users learn a new language by leveraging **etymology and morphological similarities** across multiple known languages which is one of the best LLM's advantages. It provides:

- **Personalized lessons** using AI-generated content tailored to the user's background using the user's level and cache memory for the words he/she learned previously in the app.
- **Interactive chat-based learning and interface** that understand types of commands like “new lesson,” “more examples,” and “add to vocab” and apply user's command base on that.
- **Semantic Family Tree**: Generates a **conceptual map of related words** based on the user's input, helping them understand lexical families across languages.
- A **vocabulary bank** where users can collect and review learned words, broken down by root, prefix, suffix, and translations.

Main Design Decisions

- **Cohere LLM integration**: Used to generate vocabulary breakdowns, semantic relations, and dynamically detect the user's intent (e.g., new lesson vs. general question).
- **Etymology-first approach**: Every word is taught via its historical roots, affixes, and equivalent forms in the user's known languages.
- **Session state caching**: Chat history (history_chat), taught words (df_memory), and saved vocabulary (vocab_bank) are stored persistently using st.session_state.
- **User personalisation**: The interface includes sidebar settings for known languages, target language, and CEFR-level (A1–C2) to adjust difficulty.
- **Modular design**: Each functionality (chat, vocab, tree, breakdown) lives in a tab, keeping the UI clean and focused.

Main Difficulties Found

- **LLM formatting consistency**: Ensuring JSON responses from the model remain valid for parsing.
- **Prompt engineering**: Designing system prompts that reliably yield structured and pedagogically sound output.
- **Session state synchronization**: Managing chat history, memory, and vocab across user actions without reset.