Ms.Suaad Project

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Content

Project Overview:
Teacher Suaad is an AI-driven voice assistant designed to support young learners by recognizing individual children's voices, greeting them, providing interactive and educational activities, and assisting teachers by engaging children in learning experiences that are both engaging and culturally relevant. The assistant aims to foster a welcoming educational environment for children while supporting teachers in early childhood education settings.

problem statement
Studies indicate that approximately 45% of kindergarten teachers worldwide experience high levels of psychological stress due to excessive workloads and the emotional demands of managing classrooms of young children. Teacher Suad is designed to alleviate this burden by offering an interactive and intelligent assistant that can provide learning support, engaging activities, and emotional warmth for ..children, thereby allowing teachers to focus more on direct educational tasks

Objectives

Engaging Educational Content: Offer activities that teach letters, numbers, colors, .and animals in an interactive format
Improved Emotional Experience: Provide warm, welcoming messages and .interactions to help children feel more comfortable and engaged in the classroom
Teacher Support: Reduce the burden on teachers by assisting with routine .greetings and learning activities

Technical Overview

IBM Watson Assistant: For creating conversational AI, capable of managing .greetings, responses, and personalised activities

IBM Watson Studio: To integrate and customise the ALLaM model for child .interaction and engagement

Flutter: For developing the front-end user interface and integrating with .backend systems AND to convert Text-to-Speech (TTS) and speech-to-text

Implementation :

API Integration :

The app uses a dedicated API to access the AI model, which helps analyse user inputs and provide appropriate responses. The API communication is implemented using the `http` package in Flutter

Chat functionality :

The chat interface relies on the `dash_chat_2` library, allowing both text and voice interaction.

The app sends user queries to the model and receives responses to create an interactive chat experience

Text-to-Speech (TTS):

This feature utilises the `flutter_tts` library to convert the model-generated text .into audio that is played back to the user

The voice is configured to be gentle and teacher-like to suit the target users, with .custom settings for speed and tone

Challenges :

1. Handling Incomplete or Incorrect Responses: Initially, the responses from the API were incomplete or unclear. To resolve this, you added prompt engineering inside the code and implemented a method to format the messages with specific markers (`</s><s> [INST]` for odd-index messages and `[/INST]` for even-index ones).
2. Access Token Management: You faced issues with using the access token correctly after receiving it from the API. By implementing a `TokenHelper` class with a function to refresh the access token, you ensured that the token was retrieved and used efficiently for subsequent API calls.
3. Message Formatting and Data Handling: Properly formatting and concatenating the API responses with the existing data (like `main_prompt`) was a challenge. The solution involved creating a function that formats messages dynamically based on their index and appends them to the main prompt.

Future improvements :

Enhanced Voice Recognition:

- To improve the accuracy of voice recognition, particularly for children, the app will incorporate advanced speech-to-text technologies. This will enable better recognition of diverse accents, pronunciation variations, and background noise typical in children's speech.

Interactive Gamification:

- The app will introduce interactive game elements, such as achievement badges, rewards, and educational challenges, to increase user engagement. These gamified features will motivate users to complete tasks and milestones while learning.

Expanded Knowledge Base & UI Improvements:

- The app's educational content will be continuously expanded based on user feedback and preferences. By integrating more diverse topics, the app will better cater to the needs and interests of the users, ensuring that the knowledge base remains relevant and up-to-date. Along with this, the user interface will be enhanced to ensure a more engaging and intuitive experience, improving overall user interaction and satisfaction.

Conclusion :

As digital education becomes increasingly important in Saudi Arabia's Vision 2030, **Teacher Suaad** aligns with the nation's goals of improving the quality of education and fostering technological innovation. By integrating AI-driven solutions in the classroom, the project .supports the development of a modern, digital learning environment for the next generation

Teacher Suaad is an AI-driven voice assistant designed to enhance early childhood education by offering personalised support for young learners and assisting teachers. It recognizes individual children's voices, provides engaging educational activities, and creates a welcoming environment with warm, interactive messages. The assistant supports activities focused on teaching letters, numbers, colours, and animals, making learning both fun and .educational

The project aims to address the high levels of stress experienced by kindergarten teachers by reducing their workload through intelligent support in routine greetings and educational activities. By doing so, Teacher Suaad allows teachers to focus more on direct teaching. This solution has the potential to significantly improve the educational experience for children and .teachers, particularly in Arabic-speaking regions