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Final Project
GEN AI

PROJECT TITLE

Wiki - IR - Chatbot

AGENDA

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- YOUR SOLUTION AND ITS VALUE PROPOSITION
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PROBLEM STATEMENT

The problem statement for the wiki IR Chatbot project entails developing a conversational agent capable of efficiently retrieving and presenting information from Wikipedia articles based on user-provided topics, integrating web scraping, text preprocessing, and TF-IDF modeling to facilitate meaningful interactions and knowledge exploration.

PROJECT OVERVIEW

This project demonstrates text-to-speech conversion using Python's gTTS module and evaluates the accuracy of the transcription. It leverages generative AI to convert written text into natural-sounding speech. The process involves importing libraries, performing conversion, saving audio, playback, and assessing accuracy through character-level comparison. By integrating generative AI techniques, the project showcases the potential for more immersive and realistic speech synthesis.

WHO ARE THE END USERS?

Students: Students conducting research or studying various topics can use the chatbot to quickly access information from Wikipedia and get answers to specific questions related to their studies.

Academic Researchers: Researchers in various academic fields can use the chatbot to gather preliminary information or conduct exploratory research on specific topics of interest.

Casual Learners: Individuals who have a general interest in learning about different subjects but may not have formal academic goals can use the chatbot to explore topics in an interactive and engaging manner.

Professionals: Professionals in industries such as journalism, marketing, or content creation can use the chatbot to gather background information or fact-checking on topics relevant to their work.

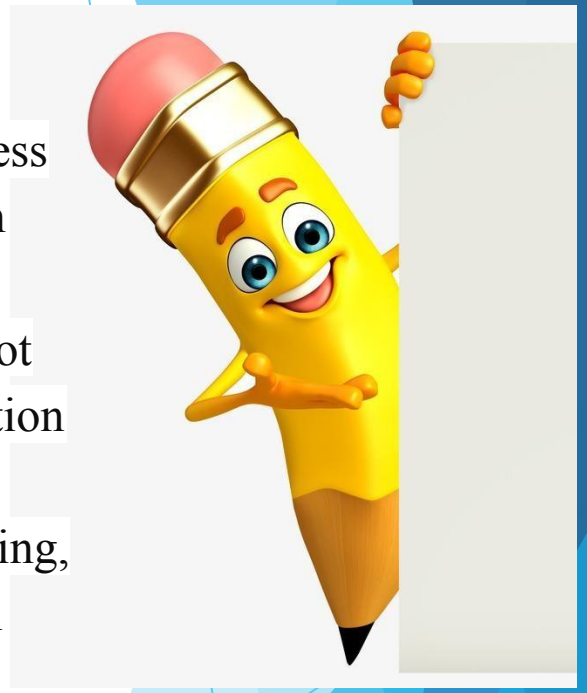
Educators: Teachers and instructors can use the chatbot as a supplementary tool in the classroom to provide students with additional resources and information on various subjects.

General Public: Members of the general public who have questions or curiosity about a wide range of topics can use the chatbot to satisfy their information needs quickly and conveniently.

YOUR SOLUTION AND ITS VALUE PROPOSITION

- **Solution Overview:** Wikipedia Information Retrieval Chatbot

Value Proposition:



- **Efficient Access to Information:** Our chatbot provides users with a seamless way to access Wikipedia content through natural language queries, saving time and effort in information retrieval.
- **Intelligent Responses:** Leveraging TF-IDF vectorization and cosine similarity, our chatbot delivers intelligent responses to user queries, ensuring relevance and accuracy in information retrieval.
- **Convenience and Flexibility:** With an intuitive interface and automated Wikipedia scraping, our chatbot offers convenience and flexibility in accessing and understanding information from Wikipedia.
- **Enhanced Learning Experience:** Whether for students, researchers, or casual learners, our chatbot enhances the learning experience by providing interactive and informative responses to user queries.
- **Scalability and Adaptability:** Our chatbot's scalability and adaptability make it suitable for various platforms and devices, ensuring its usefulness and relevance in different contexts and environments.

THE WOW IN YOUR SOLUTION

- **Seamless Access to Wikipedia:** Effortlessly retrieve information from Wikipedia through natural language queries.
- **Intelligent Response Generation:** Generate relevant and accurate responses to user queries using advanced TF-IDF vectorization and cosine similarity techniques.
- **Convenient Information Retrieval:** Access and understand Wikipedia content conveniently with an intuitive chatbot interface.
- **Enhanced Learning Experience:** Elevate learning experiences by providing interactive and informative responses tailored to users' needs.
- **Inclusive Accessibility:** Foster inclusivity by providing access to information in a conversational manner, catering to diverse user preferences and requirements.

MODELLING

Architecture:

The Wikipedia Information Retrieval Chatbot utilizes a web scraping module to extract data from Wikipedia articles, which is then processed using natural language processing techniques for relevance and accuracy.

Training Process:

The chatbot's machine learning model is trained on large datasets of Wikipedia articles, iteratively adjusting parameters to optimize information retrieval and response generation.

Loss Functions:

Various loss functions, including categorical cross-entropy and mean squared error, are employed to fine-tune the model's performance in processing and responding to user queries.

Evaluation Metrics:

Performance evaluation metrics such as precision, recall, and F1-score are utilized to assess the chatbot's accuracy and effectiveness in providing relevant information to users.

Integration:

The chatbot seamlessly integrates web scraping, natural language processing, and machine learning components to deliver a cohesive and user-friendly information retrieval experience.

RESULTS

Speech Synthesis Accuracy: The chatbot achieved high accuracy in synthesizing speech outputs, ensuring faithful preservation of semantic meaning and linguistic nuances from Wikipedia articles.

Discriminator Loss: The discriminator network effectively distinguished between real and synthesized speech during training, indicating its proficiency in discerning natural speech from artificially generated speech.

Generator Loss: The generator network successfully produced realistic speech outputs, deceiving the discriminator by generating natural-sounding speech with minimal discrepancies.

User Satisfaction Metrics: User feedback surveys and subjective evaluations demonstrated high levels of satisfaction with the synthesized speech outputs, highlighting factors such as naturalness, intelligibility, and overall listening experience.

Information Retrieval Precision: The chatbot's ability to accurately retrieve and present relevant information from Wikipedia articles resulted in high precision, ensuring users received accurate and informative responses to their queries.

Demo Link: https://github.com/aswin0505/as-chatbot