PROJECT: SPEECH TO TEXT & TEXT TO SPEECH

This project provides a user-friendly application that allows users to convert text to speech and speech to text using Python. It leverages the gTTS (Google Text-to-Speech) library for generating speech from text and the speech_recognition library for transcribing spoken words into text. The application features a graphical user interface (GUI) built with tkinter, making it accessible for users without programming experience.

Project Overview:

Key Features

Text to Speech Conversion: Users can input text and select a language accent to generate speech. The application saves the generated speech as an MP3 file, which can be played back immediately.

Speech to Text Conversion: Users can record their voice through a microphone for a specified duration. The application captures the audio and converts it into text using Google's speech recognition service.

Language Support: The application supports multiple languages for text-to-speech conversion, allowing users to select their preferred language accent.

User-Friendly Interface: The GUI is designed to be intuitive, with clear input fields and buttons for each functionality, making it easy for users to interact with the application.

How It Works

1. **Text Input**: The user enters the text they wish to convert into speech and selects the desired language accent.
2. **Speech Generation**: Upon clicking the "Convert Text to Speech" button, the application generates the speech and plays it back.
3. **Voice Recording**: For speech-to-text conversion, the user specifies a duration for recording their voice. After clicking the "Convert Speech to Text" button, the application listens to the microphone input and processes the audio.
4. **Output Display**: The recognized text from the audio input is displayed to the user in a message box.

Libraries Used

gTTS: This library is used for converting text into spoken words using Google's Text-to-Speech API. It supports various languages and accents.

SpeechRecognition: This library provides easy access to various speech recognition APIs, including Google Web Speech API, enabling the conversion of spoken language into text.

tkinter: This is a standard GUI toolkit for Python, used to create the application's graphical interface. It allows for the creation of windows, buttons, text fields, and other interface elements.

Installation Requirements

To run this application, users need to have Python installed on their systems along with the required libraries. The installation can be done easily using pip, which is Python's package installer.

Usage Instructions

1. **Run the Application**: Start the application by executing the Python script.
2. **Input Text**: Enter the text you want to convert to speech in the designated text area.
3. **Select Language**: Provide the language code (e.g., 'en' for English) in the accent input field.
4. **Generate Speech**: Click on the "Convert Text to Speech" button to create and play the audio.
5. **Record Speech**: For converting speech to text, enter the desired recording duration and click the "Convert Speech to Text" button, then speak into the microphone.
6. **View Output**: The recognized text will be displayed in a message box.

Supported Languages:

The application supports a variety of languages for text-to-speech conversion. Users can view the list of supported languages and their corresponding codes by using the "List languages" feature in the application.

Conclusion:

This Python project offers a user-friendly application for converting text to speech and speech to text, utilizing the gTTS and speech_recognition libraries within a tkinter GUI. Its key features include:

- **Ease of Use**: Simple interface for quick text input and speech generation.
- **Language Support**: Multiple language options for text-to-speech conversion.
- **Open Source**: Licensed under the MIT License, allowing for community contributions and enhancements.

Overall, this project provides a valuable tool for users needing efficient text and speech conversion, making it suitable for both personal and professional applications.