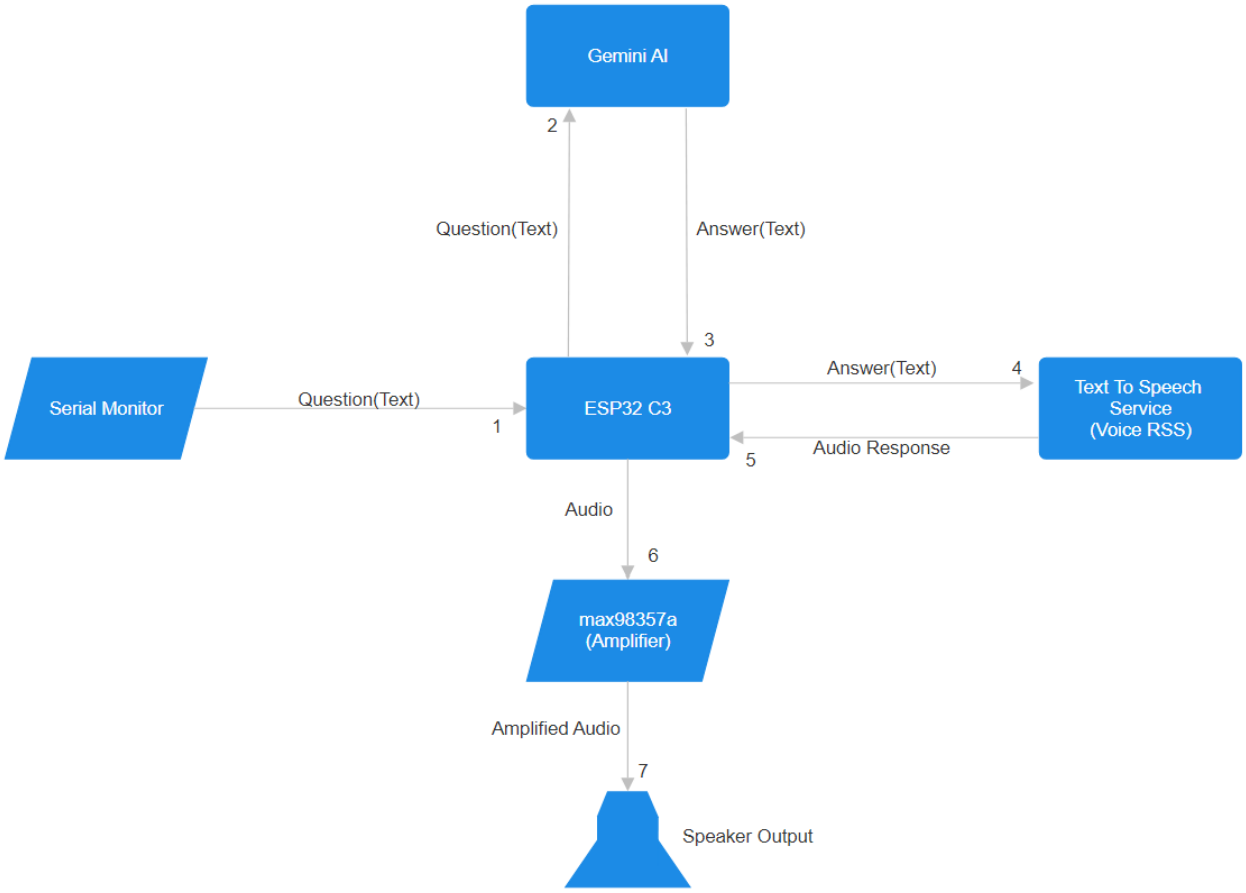
Project Name: Interactive Question-Answering System Using ESP32 with Text-to-Speech Output.

Project Details:

This project demonstrates how to use an ESP32 microcontroller to create an interactive question-answering system. The system leverages Gemini AI's API for generating responses to questions inputted via a serial monitor. The received responses are converted into speech using a text-to-speech (TTS) service, with the audio being played through a MAX98357 amplifier connected to a speaker.

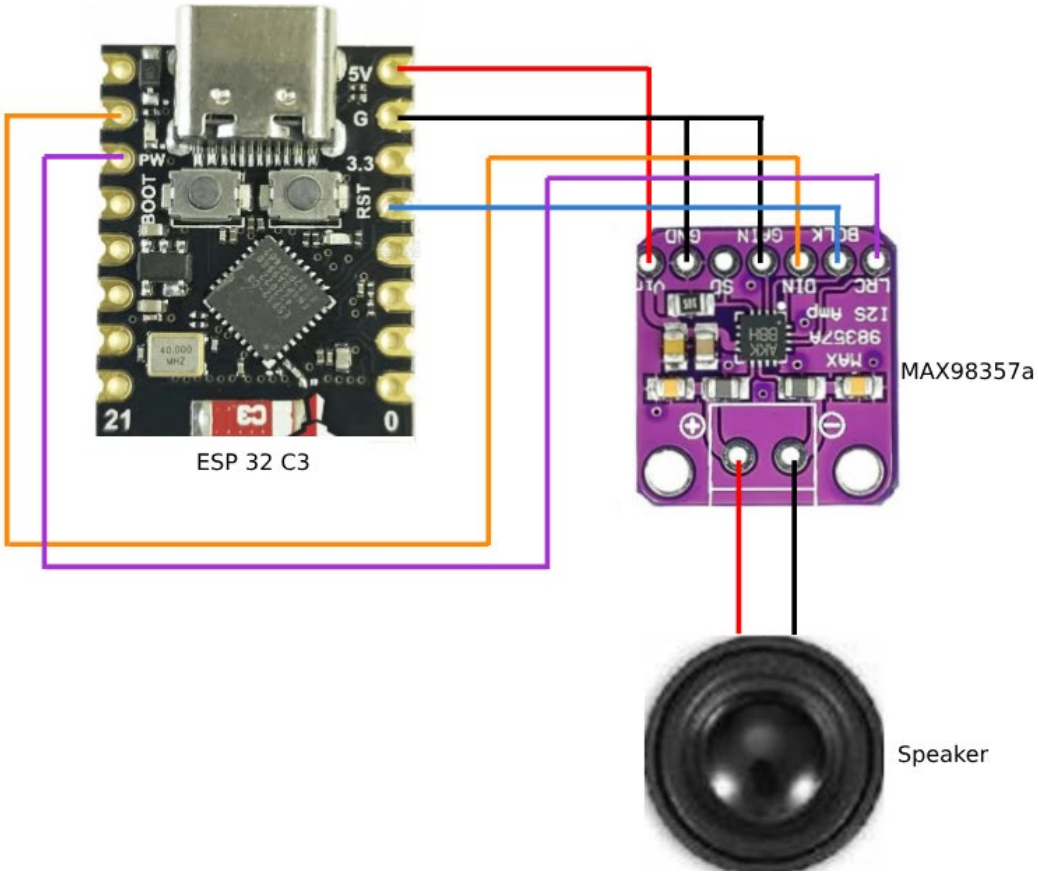
Working Mechanism:



1. Input via Serial Monitor:
    - The user types a question into the ESP32 serial monitor.
    - ESP32 sends the question to the Gemini AI API host server.

2. Processing the Question:
    - The Gemini AI API processes the question and returns a text response.
3. Text-to-Speech Conversion:
    - ESP32 sends the text response to the VoiceRSS API for text-to-speech conversion.
    - The VoiceRSS API returns the audio in MP3 format.
4. Audio Playback:
    - The MP3 file is received by the ESP32 and played using the MAX98357 amplifier.
    - The audio is outputted through a connected speaker.

Circuit Diagram:



Results:

The project successfully demonstrates the integration of multiple services to create a functional interactive system. The following outcomes were observed:

Question Input: The ESP32 accurately transmitted user questions to the Gemini AI API.

Answer Generation: Gemini AI API provided relevant and coherent answers to the questions.

Text-to-Speech Conversion: VoiceRSS effectively converted the text responses into MP3 audio format.

Audio Output: The MAX98357 amplifier played the generated MP3 audio with good clarity through the speaker.