Ian Wu
Kyle Wong

ECE153B Project Proposal:
Alexa V-1

Overview:

Our goal is to use a MAX78000 microcontroller to create a virtual assistant for adjusting the brightness of a smart bulb, using an ML voice recognition model to recognize specific voice commands.
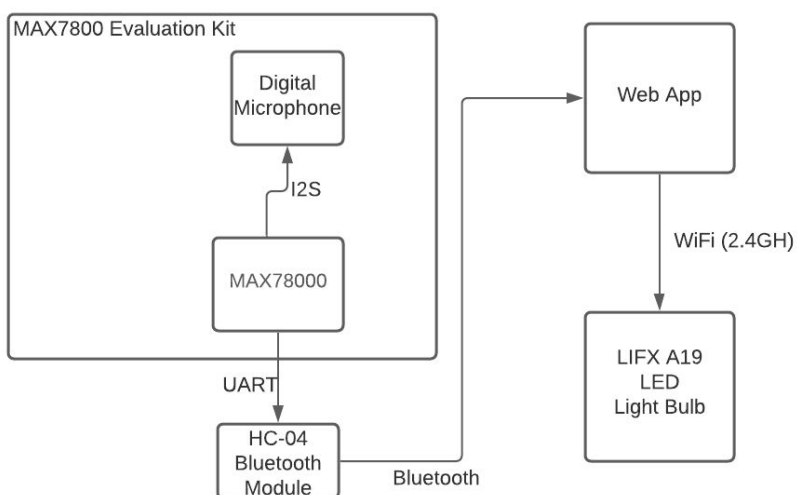
Website:

https://sites.google.com/view/alexav-1/home

Peripherals:

- HC-05 Bluetooth Module
- Digital microphone

Serial interface protocols:

- I2S
  - Digital microphone
- UART
  - HC-05 Bluetooth Module

Block diagram:

Responsibility list:

Ian:
- Configure the board to work with ML scripts
- Establish bluetooth connection with the web app

Kyle:
- Create Python script to capture bluetooth data and interact with smart bulb
- Modify ML model to process voice commands and generate microcontroller interrupts

Software structure:

An ML model running on the microcontroller will generate interrupts, triggering UART communication with HC-05 module. A Python script running on a separate device will accept and parse Bluetooth commands, interfacing with the smart bulb using an HTTP API.

Useful Links:
- Datasheet
  - https://www.mouser.com/pdfDocs/MAX78000EVKIT.pdf
- Article
  - https://www.hackster.io/news/maxim-launches-edge-ai-max78000-soc-with-neural-network-accelerator-risc-v-coprocessor-6781b3e72c0d
- Source code
  - https://github.com/MaximIntegratedAI/MaximAI_Documentation/tree/master/MAX78000_Evaluation_Kit
- Web bluetooth lightbulb
  - https://urish.medium.com/start-building-with-web-bluetooth-and-progressive-web-apps-6534835959a6
- https://www.youtube.com/watch?v=ZyetXihGrM0