# Project 6

Temperature alert system with Bluetooth readouts

CptS 466

Kevin Evans

## Requirements

### Overview

For this project, we will implement a system that samples the air temperature and reports the temperature to a client over Bluetooth. The system also will output audio and display an LED depending on the temperature.

### Functional Description

The deliverable will be a system that senses the ambient air temperature. It will set the LED color and control a speaker depending on the temperature: red (400 Hz) for temperatures over 50 C, yellow (200 Hz) for temperatures between 35 and 50 C, and green (100 Hz) for temperatures under 35 C.

### Design Document

The SysTick interrupt will trigger a sample of the TMP36 temperature sensor, which is sent to the ADC and converted to a temperature in Celsius. The user will connect to the Bluetooth module to see the current temperature sampled at 400 Hz. Depending on the temperature, the color of on-board RGB LED will change and an audio tone is heard, specified by the temperatures in the functional description.

Diagram

Description automatically generated

Figure 1: The dataflow diagram of the system.

## Discussion

There are several limitations of the system. First, the fidelity of the audio is poor due to using only a 4-bit DAC. Sometimes the audio has noise and does not sound like a pure tone.