ECE 476/676 - Homework #12

WiFi - Due Monday, May 5th

WiFi Weather Station

Use a BME280 sensor along with a CdS light sensor to build a weather station you can monitor over a WiFi network. Display in real time on a WiFi screen

- Temperature
- Humidity (optional)
- Pressure
- Light level

Also allow the user to set the color of a NeoPixel over the WiFi network.

WiFi Transmit

1) Hardware: Specify the hardware for connecting sensors to your Pico chip

2) Calibration: Determine a calibration function for your light sensor. The resistance - lux relationship is of the form

$$R = a \cdot \left(\frac{1}{lux} \right)^b$$

where (a, b) are constants. You can find 'a' and 'b' using a two-point calibration for the light sensor

- Measure light level in the room using your cell phone and a light sensor app
- Measure the resistance at two different light levels (lights on / lights off, inside / outside)
- Determine (a, b) using two equations and two unknowns.

3) Software: Give the Python code for reading the sensors and seeing their values on your cell phone over a WiFi link

- Temperature
- Humidity (optional)
- Pressure
- Light level

4) Testing: Collect data to verify you can read temperature / pressure / light remotely over a WiFi link

WiFi Receive

5) Software: Give the Python code to allow you to drive the NeoPixel using your cell phone and a WiFi link

6) Testing: Collect data to verify you can control the NeoPixel with your cell phone and a WiFi link

7) Demo. In-person or on video.