ECE 476/676 - Homework #9

Pressure, Acceleration, I2C Communications - Due Monday, November 10th

Program, test, and demonstrate an embedded system which uses

- A GY-521 accelerometer, or
- A BME280 temperature / pressure sensor, and
- The LCD display on your Pico board

Some suggestions are:

- How High Can You Jump? Press button GP15 to start recording your acceleration for two seconds. After pressing GP15, wait 5 seconds then beep. At that point, jump as high as you can. The Pico then measures the acceleration for two seconds, computes how long you were in the air (acceleration is zero) and displays how high you jumped.
- Magic 8-Ball. Press GP15 to start. Ask your Pico a life-changing question. Shake the accelerometer three times then flip it over to see your answer. The magic 8-ball then reveals the answer on the LCD display.
- Pillow vs. Carpet vs. Tile. Determie the maximum acceleration experineced when you drop your accelerometer on a pillow / carpeted floor / tile floor. After pressing GP15, wait 5 seconds then beep. YOu then start collecting acceleration data for two seconds. During those two seconds, drop the accelerometer onto the pillow / carpet / tile. The resulting maximum acceleration experienced is then displayed on the LCD display.
- Temperature Profile: Measure the temperature and pressure of your refrigerator, freezer, or bedroom over one hour. Display the data on your LCD display over this time.
- Other

1) Requirements

- Specify what your program is going to do
- Give specific numbers so you have something to design to and something to test against

2) Python Code

- Give the resulting Python program

3) Validation

- Collect data to validate your sensor is working
- Collect data to validate that your code meets your requirements
- Each requirement should have data showing it was met

4) Results

- Demonstrate your working program
- Graphs showing acceleration / temperature / pressure vs time
- Recorded video also works