ECE231 Lab Assignment #5
Due: 11:59 pm, Thursday 5/5/22

In this assignment, you will implement an ultrasound range measurement system with audible and visual indications of range using an ATmega328p on a breadboard powered by a battery.

Problem statement: Design and build an embedded system that measures object distance using the HC-SR04 ultrasound device. Indicate object range visibly using the 0.96" OLED display and audibly using a piezo-electric speaker.

Use the following specification:

5.1 Your system shall measure the range (distance) to objects placed >5 cm and <200 cm from the ultrasound sensor.
5.2 The system shall display range in both cm and inches on the OLED display.
5.3 The system shall play an audible tone having a frequency linearly related to object distance. Objects at close distance shall result in higher frequencies than objects at farther distances. You should use your own judgement to determine the range of audble frequencies.
5.4 Power your system using the 9V battery supplied in your kit

What to submit:

- Video demonstrating a functioning system meeting specifications 5.1 - 5.4. Place a piece of paper in the background with your name hand-written on it.
- Copy of your source code

Material for this assigment will be covered in class as follows:
L20 Wednesday 4/20/22 - FTDI & Ulrasound sensor programming
L21 Monday 4/25/22 - OLED display and interrupt programming
L22 Wednesday 4/27/22 - External event triggers
L23 Monday 5/2/22 - in-class Q&A Session for this Lab Assignment.