Ian and Thomas
Learning Module #1
Arduino

Final Report:
Ian Behn and Thomas Polito

- In the timespan given for this brief project, Ian and Thomas went over a small plethora of just a handful of the things one can do with an Arduino, thanks to the kit that had been supplied to them

- But first, they had to learn the wiring component of the Arduino, which admittedly took some time. Once that had been accomplished, they experimented around with a handful of the components contained within the kits given. Such as LEDs, RGB LEDs, buttons, Ultrasonic sensors, and beepers.

- There were a variety of problems that were encountered throughout this module, though most of these issues were more or less negligible. The first issue encountered was certain pins in Ian's Arduino giving less power than that of Thomas'. This caused some of Ian's LEDs to be much dimmer than one particular LED which was at normal brightness. This issue was later resolved by changing the voltage output in the digitalWrite() from HIGH (which is a constant for 5 volts) to 3, which made the normal light slightly dimmer, to a point that was barely noticeable, and made the other lights as bright as they should have been. This seemingly same problem came up again at the end of the module, but without a resolution. Another issue was with the ultrasonic sensors, the premade Arduino code was written for the HC-SR03 model, while they were using the HC-SR04 model. The glaring difference between these two models, being the different pins, made the premade code incompatible with the HC-SR04. So, to resolve this issue an hour or so of research revealed that by modifying the code to use two instead of one pins, the HC-SR04 would work with it.

- A suggestion to others who may do this activity, definitely sign out the Arduino kit. It is a good way to mess around with and learn the Arduino's bits, such as what pin does what, what means what, and etc. On top of that, one may also just find it fun to mess around with, especially when there is time to kill in a study hall or something, but do be careful as the box containing the kit is, of course, not indestructible.

- To summarize the experience with this module;
  - Got the kit and didn't fully understand the wiring
  - Messed around with the kit and eventually kind of understood the wiring
  - Messed around with the LED lights and modified the premade code just to see what will happen
  - Made alternating two lights in free time and then made three alternating lights in class
  - Start to mess around with the ultrasonic sensors
  - Try hooking them up to the premade code, unknowing it was for a different model entirely
  - It doesn't work, unsurprisingly
  - Research how to connect the sensor, what the serial port is and how it works, and how to modify the code so that the HC-SR04 sensor would be compatible

- Get it to work in free time and unable to replicate it in class
- Replicate it in class
- Get it to sense stuff, relatively finicky but seems fine the day after
- Hook it up so certain lights turn on determined on the distance of an object from the sensor
- Mess around with RGB LED light and learn how to make it what color
- Hook it up to the ultrasonic sensor so that only one light is necessary to change colors based on distances rather than using three differently colored lights
- Attached a beeper/buzzer so that when the light is red, which is the color it is when the object is too close to the sensor, the beeper/buzzer will go off and make an annoying noise
- End of module 1

Resource Page:

Videos**:**

- How to use sensors with Arduino
- You can learn Arduino in 15 minutes.
- ULTRASONIC DISTANCE SENSOR HC-SR04 - Arduino tutorial #7
- Tutorial 07: digitalRead() and the Serial Port: Arduino Course for Absolute Beginners (ReM)
- Tutorial 08: analogRead() and the Serial Port: Arduino Course for Absolute Beginners (ReM)
- Tutorial 09: How to read voltages with analogRead(): Arduino Course for Absolute Beginn…
- Ultrasonic Sensor HC-SR04 and Arduino Tutorial
- HC-SR04 Ultrasonic Distance Sensor and Arduino (Lesson #9)

Arduino Tutorials**:**

Ultrasonic Sensor Tutorial
Blink Tutorial
Fade Tutorial

Log:
Day 1:
August 29, 2024
Ian and Thomas present

Made the LED lights blink and experimented with resistors to make the light dimmer or brighter. Experimented with other stuff in the code.

Day 2:
August 30, 2024
Ian and Thomas present

Made the light fade and discussed which sensors to use

Day 3:
September 3, 2024
Ian and Thomas present

Made the traffic light doohickey mechanism as requested

Day 4:
September 4
Ian and Thomas present

Played around with the fancy LED with the 4 little prongy thingies that can be RGB and stuff as well as trying different resistors (220-10k) and analog vs digital. The second two lights for Ian were dim so he was trying to figure that out. It turned out that there wasn't enough power for all lights to have the maximum amount of voltage so he tried to put all three of them at a lower power and it worked. Also used the ultrasonic sensor a little bit

Half Day & Day 5:
September 5-6
Ian got the sensor to sense something but it was not the correct length. Thomas got it to work and display the correct length yesterday but could not do that today. Gonna try the doohickey doodad on a different computer tomorrow maybe? Used the ultrasonic sensor to make the lights do a little thing where they turn on when you get close enough at certain points. Not only did a light turn on when you got close, there were three different lights and depending on how close you were to the sensor, a different light would turn on

Day 6:
September 9
Used an LED that can change colors instead of using three different LEDs. Also connected a little speaker that beeps when something gets too close. The original plan was to use a little screen but there was not enough time to figure it out.