4/23/2022

SMART AUTOMATED HOME SYSTEM WITH SECURITY

CEIS 101

Jeanine Carhart

Hi,

4/23/2022

My name is Jeanine Carhart

I’m a student in the Cyber Security program at DeVry University.

I plan to get some hands-on work experience after receiving my certificate in the Fall of 2023 while continuing to earn my Bachelor’s Degree in IT

Project: Smart Home Automation and Security System

Week 2.

* Tinkercad Simulation (2)
* Tinkercad Code

Week 3.

* IoT Parts Inventory
* Project Parts Inventory

Week 4.

* Green LED – Door Closed
* Red LED – Door Open
* Yellow LED – Door Open
* Arduino Code
* Serial Monitor

Week 5.

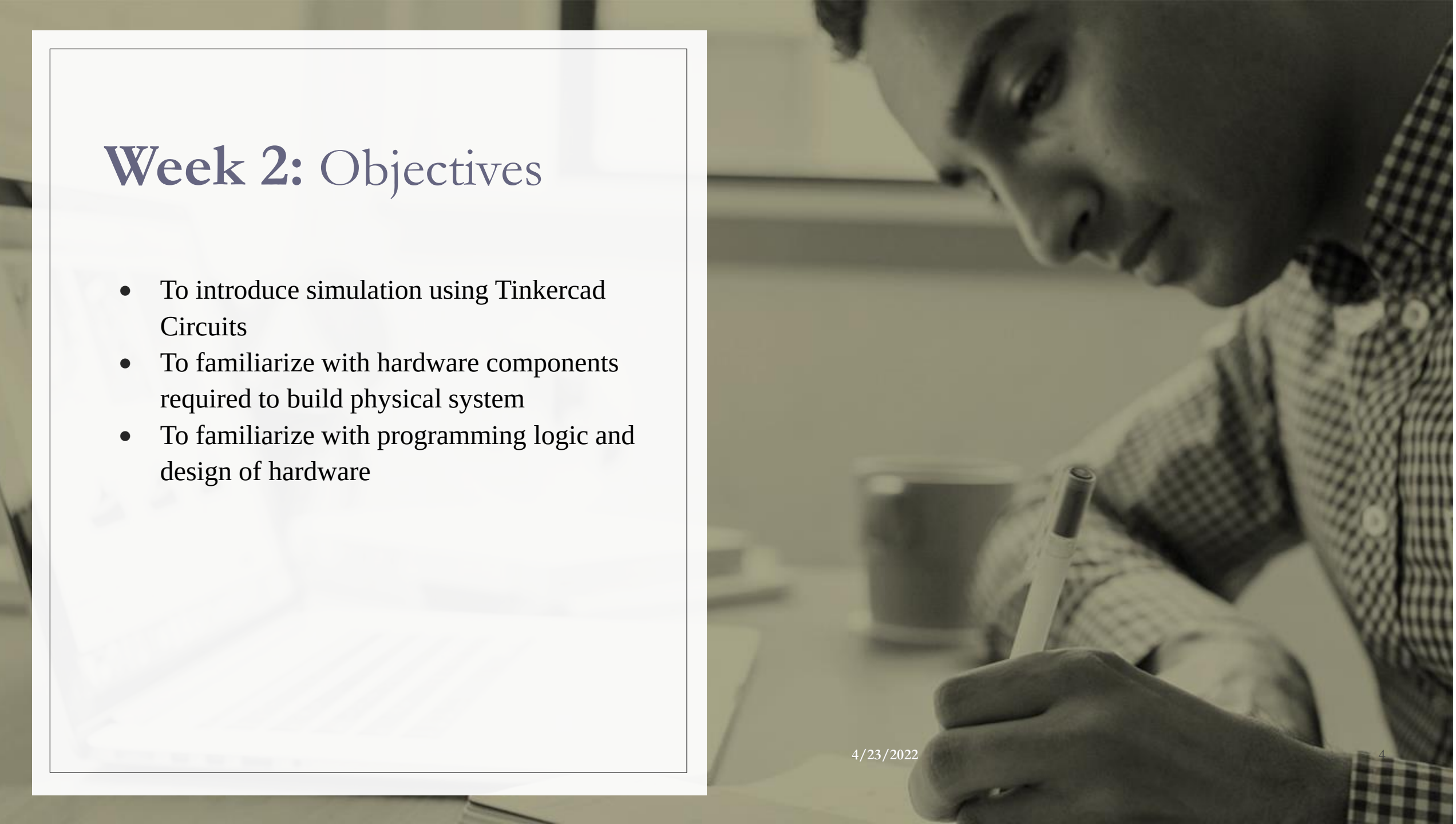
* Circuit with Green LED
* Circuit with Yellow LED
* Circuit with Red LED
* Arduino Code
* Data Plot

Week 6.

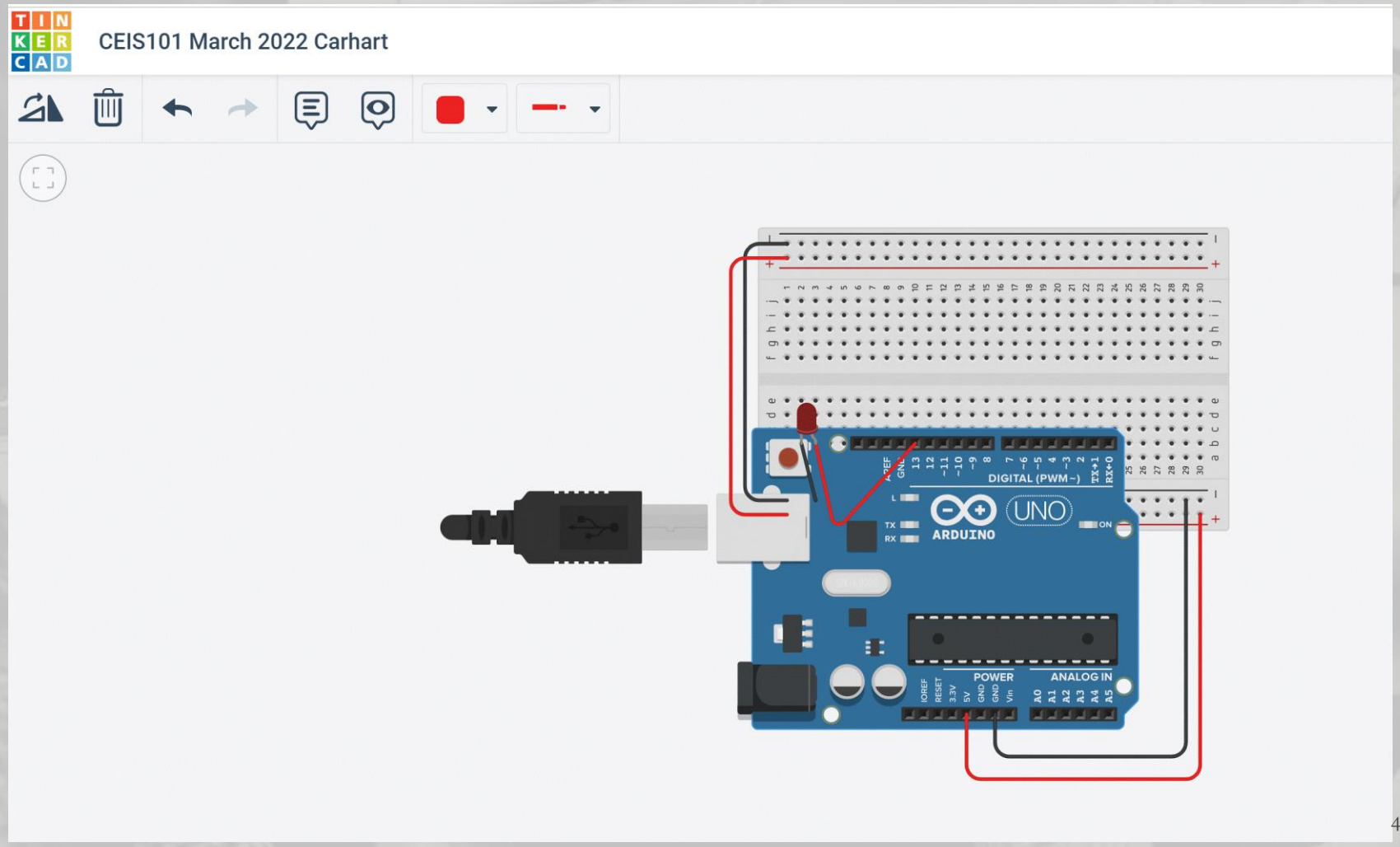
* Automated Light On
* Automated Light Off
* Arduino Code
* Serial Monitor

Week 2: Objectives

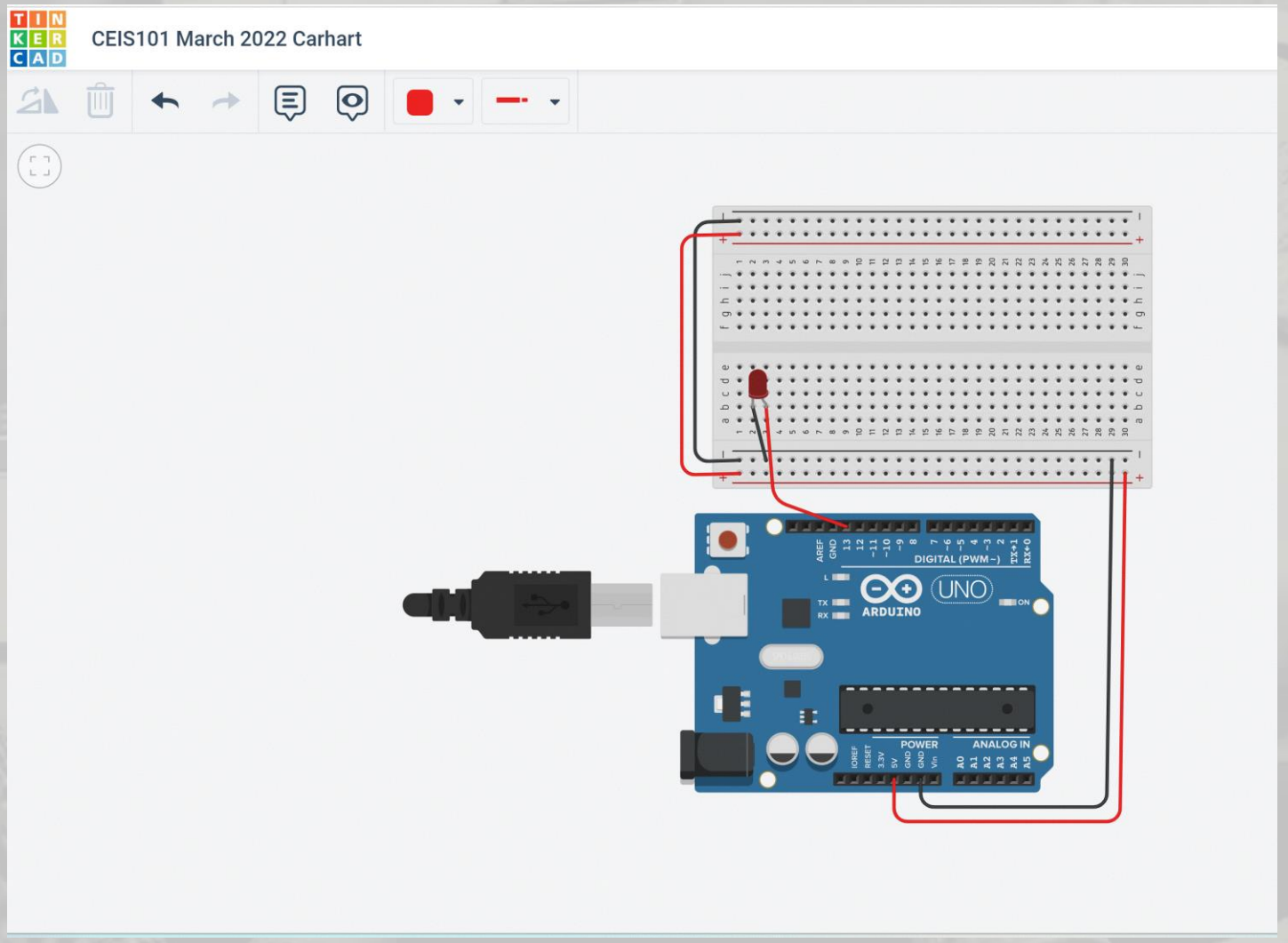
- To introduce simulation using Tinkercad Circuits
- To familiarize with hardware components required to build physical system
- To familiarize with programming logic and design of hardware



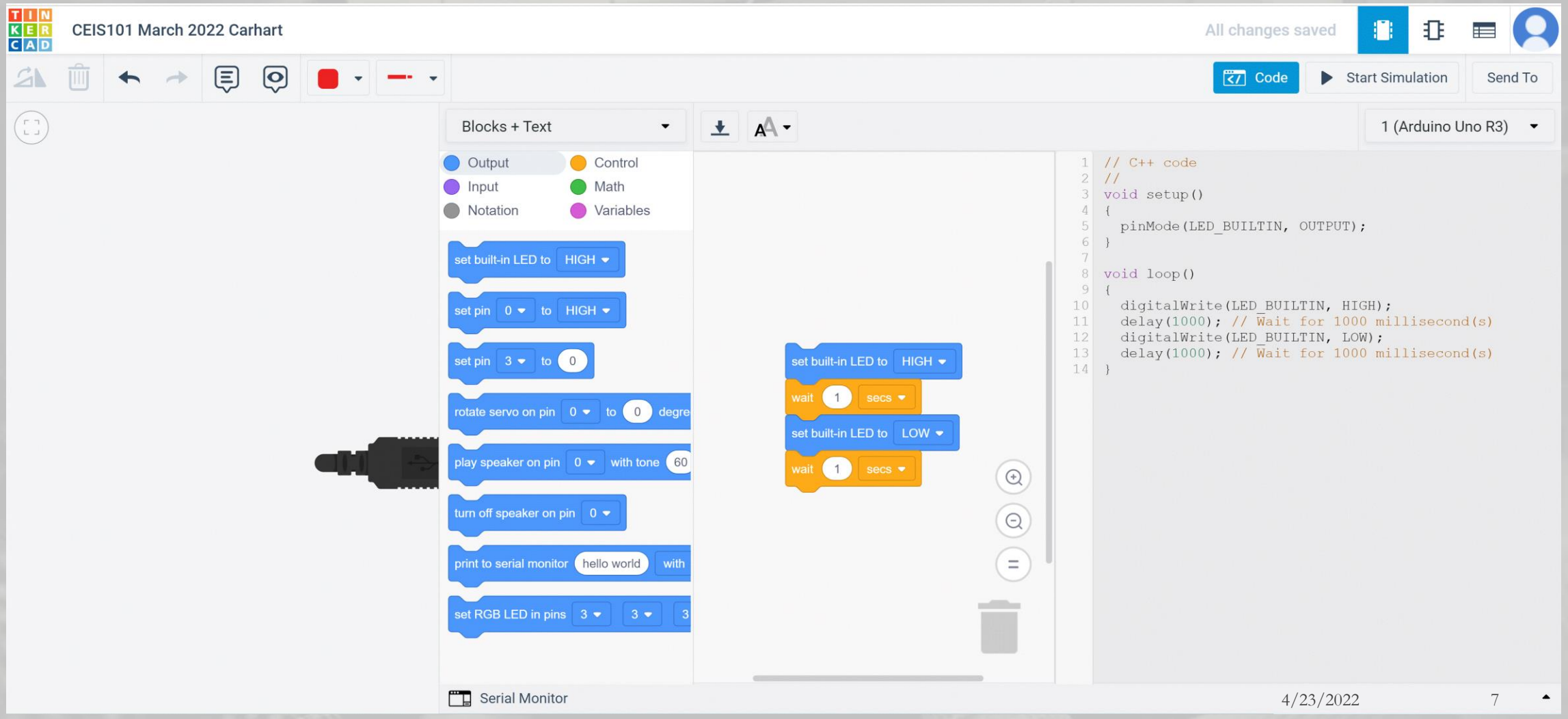
Project 1: Tinkercad Simulation 1



Project 1: Tinkercad Simulation 2



Project 1: Tinkercad Code



Week 3:
Objectives

Objectives

- To familiarize with hardware components for course project
- To learn how to build circuits with LEDs
- To learn how to program LEDs
- To learn how to initialize the Serial Monitor
- To learn how to send messages to the Serial Monitor

Week 3: Inventory

IoT Parts Inventory

Project Parts Inventory

Project 1: Parts Inventory

IoT Kit	Parts Components
UCTRONICS Kit	Arduino Mega 2560
ESP32 (2)	Resistor 10kΩ
Mini Router	Breadboard
Breadboards (3))	LEDs
Digital Multi Meter	Ultrasonic Sensor
Patch Cable	Photoresistor
USB to Micro USB (2)	Wires
LCD Modules (2)	Active Buzzer
	USB Type B Cable

Project 1: IoT Parts Inventory

Project 1: Project Parts Inventory

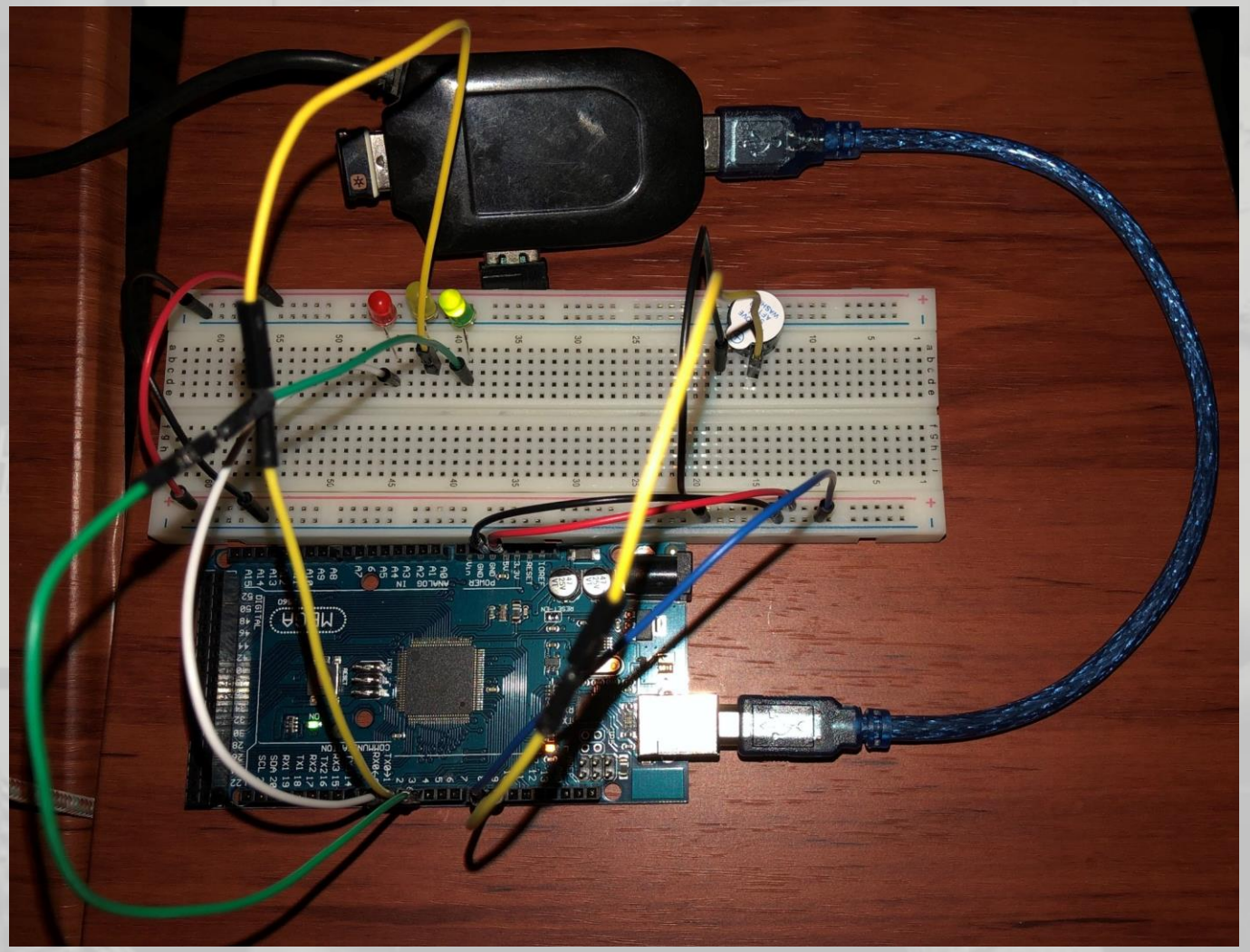
Week 4: Objectives

- To learn how to connect multiple LEDs to the Arduino Mega Board
- To learn how to connect a buzzer to the Arduino Mega Board
- To learn how to use a wire to emulate an open or closed door
- To integrate an alarm into a security system
- To familiarize with conditional programming instructions

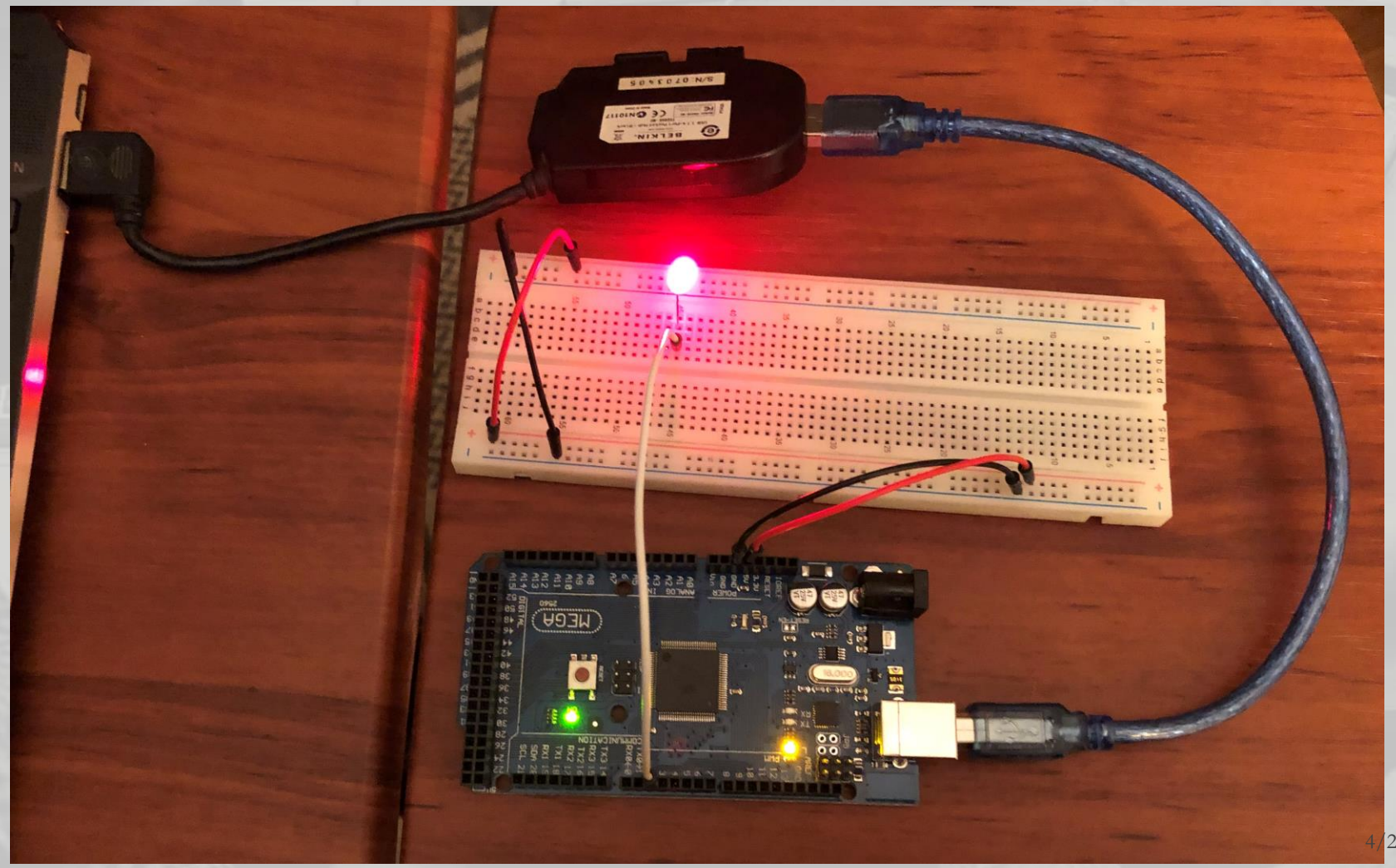
Week 4: Adding the Door Sensor

- Green LED – Door Closed
- Red LED – Door Open
- Yellow LED – Door Open
- Arduino Code
- Serial Monitor

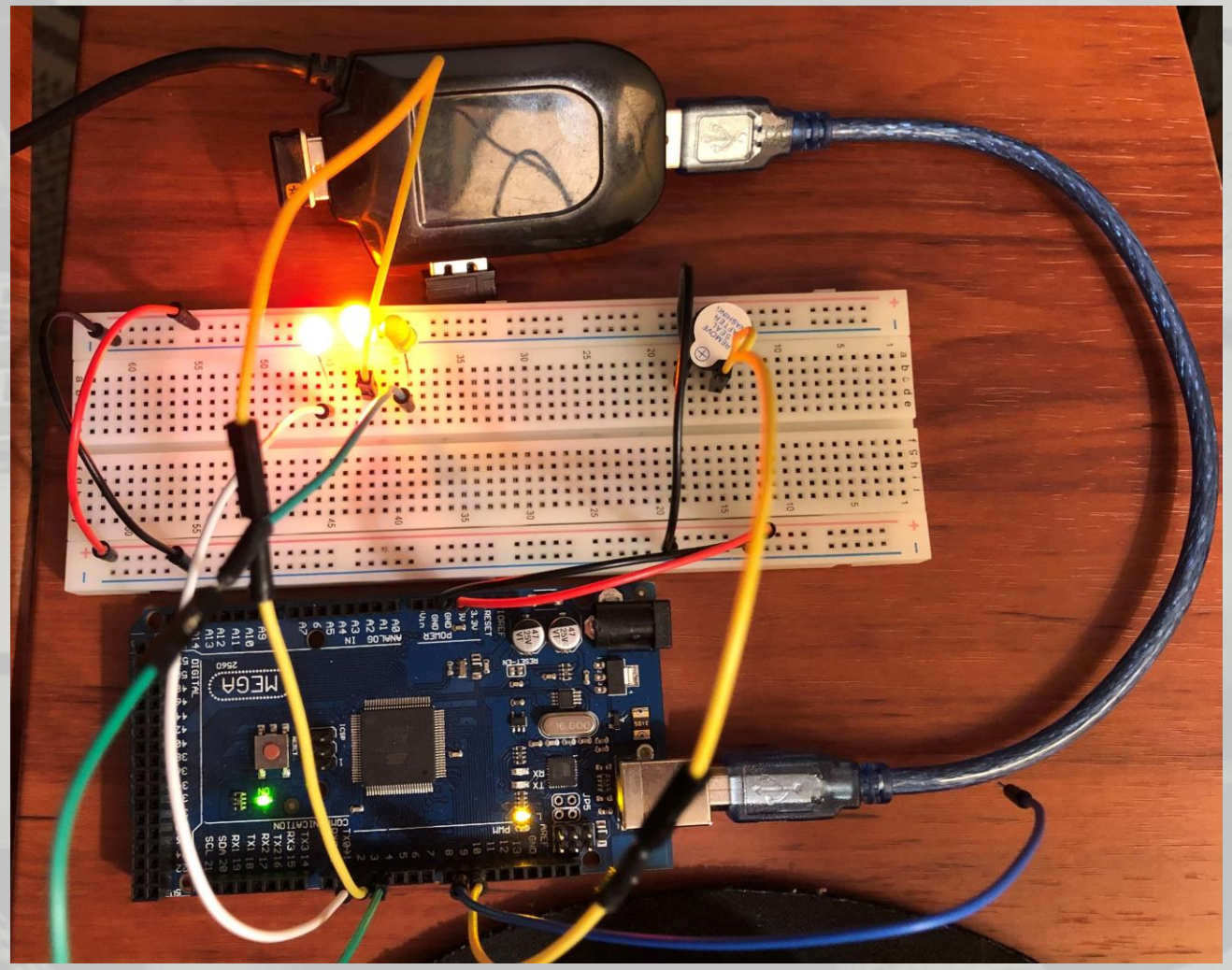
Project 1: Green LED On Door Closed



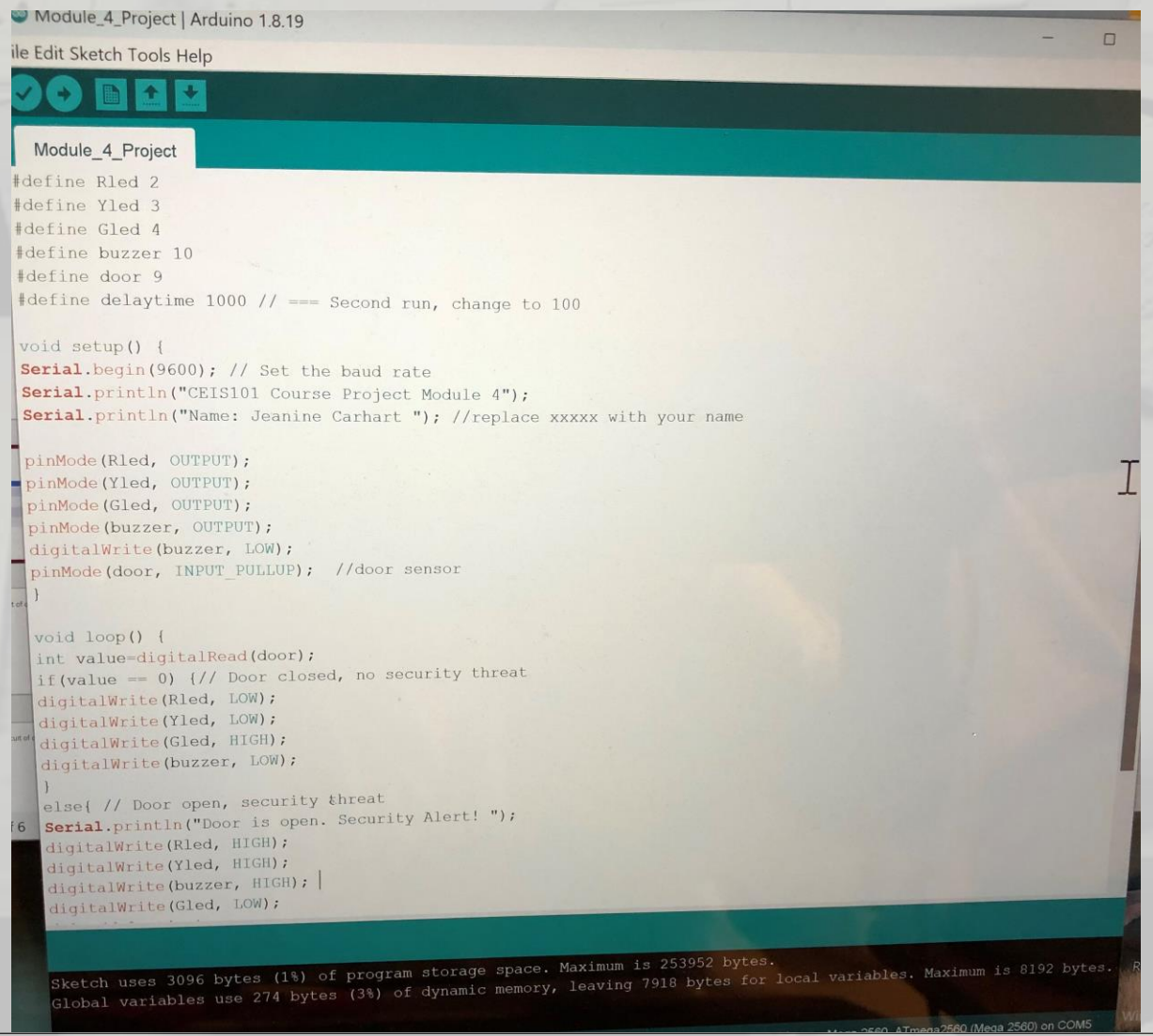
Project 1: Red LED on Door Open



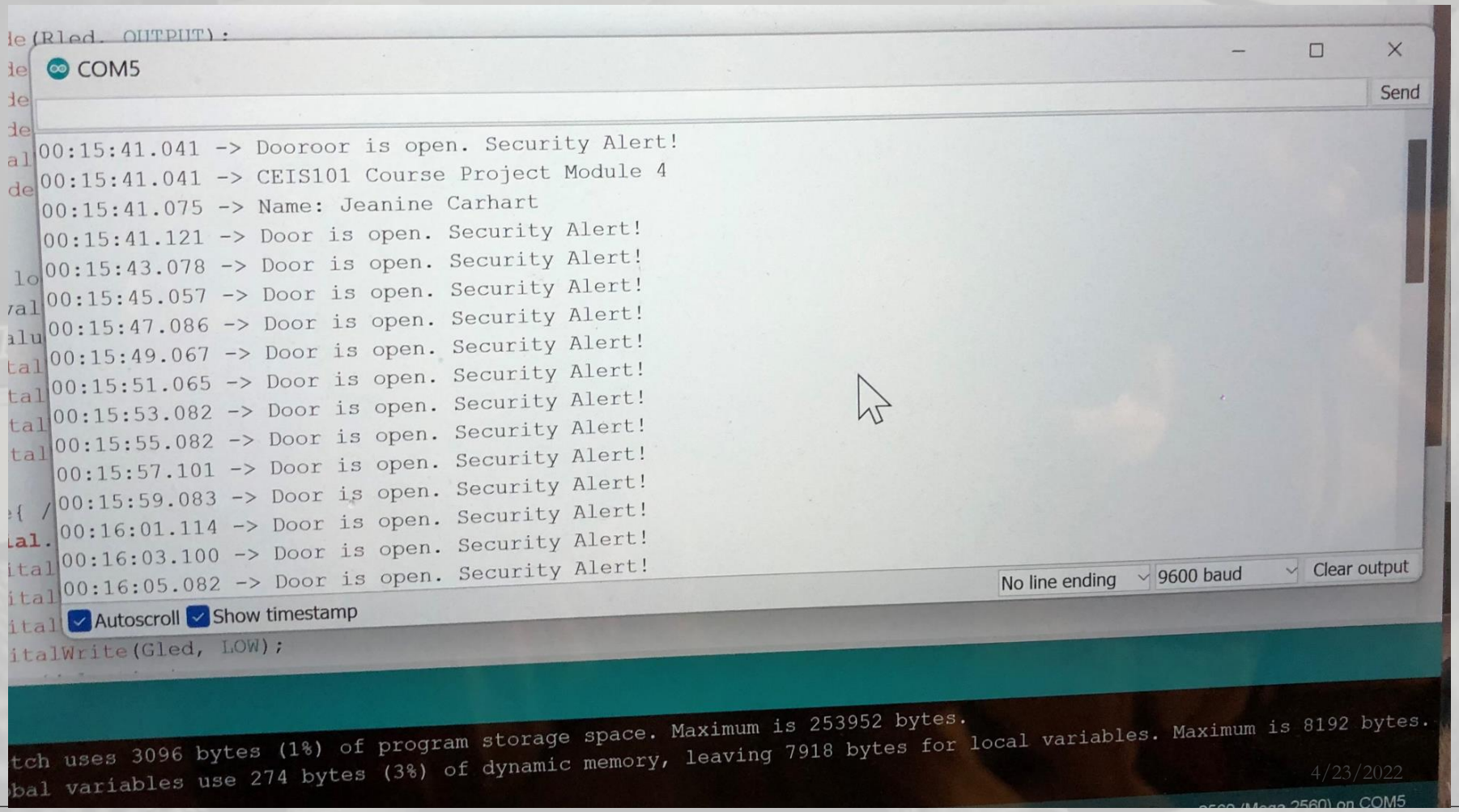
Project 1: Yellow (& Red) LED on Door Open



Project 1: Arduino Code



Project 1: Serial Monitor



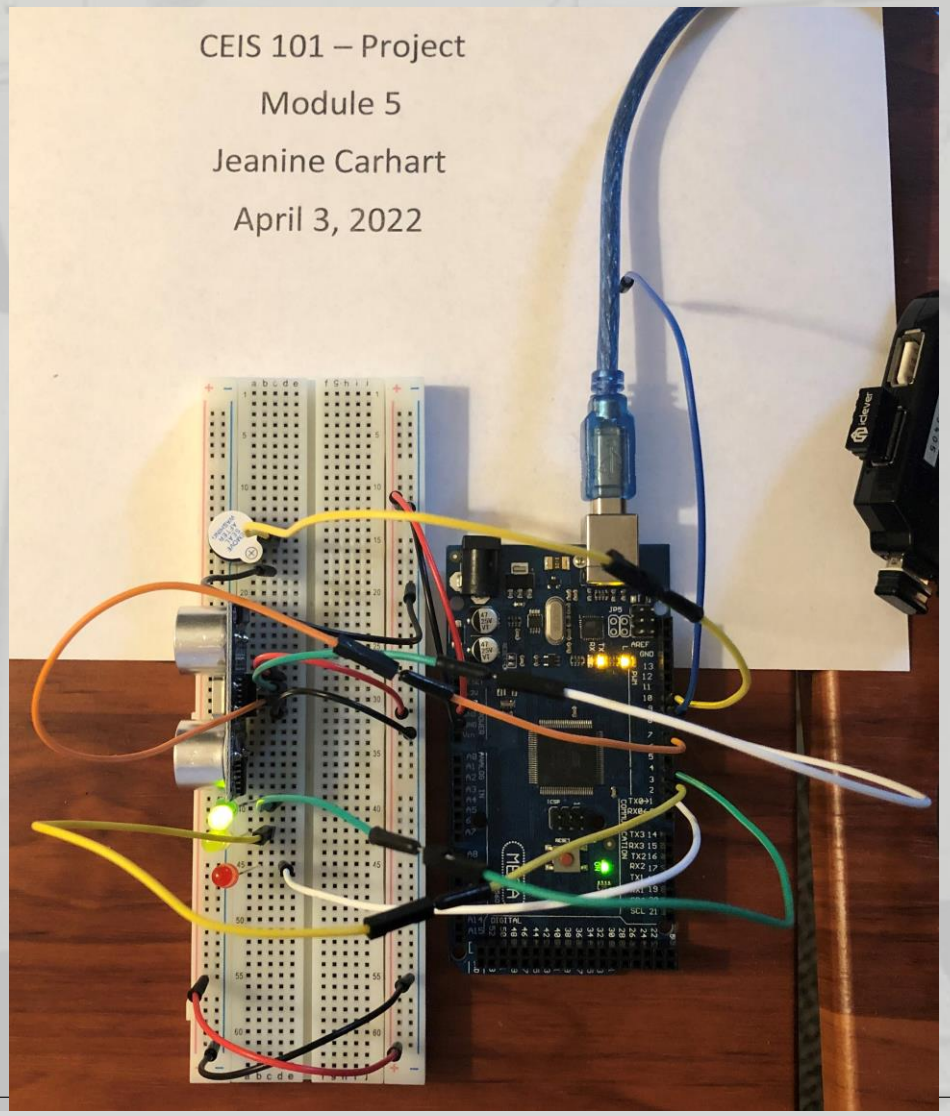
Week 5: Objectives

- To learn how to connect an ultrasonic range finder to the Mega 2560 board
- To learn how to write code that uses an ultrasonic range finder
- To learn how to write code that makes the buzzer produce sounds
- To learn how to display data to the serial plotter
- To practice analyzing data generated by sensors

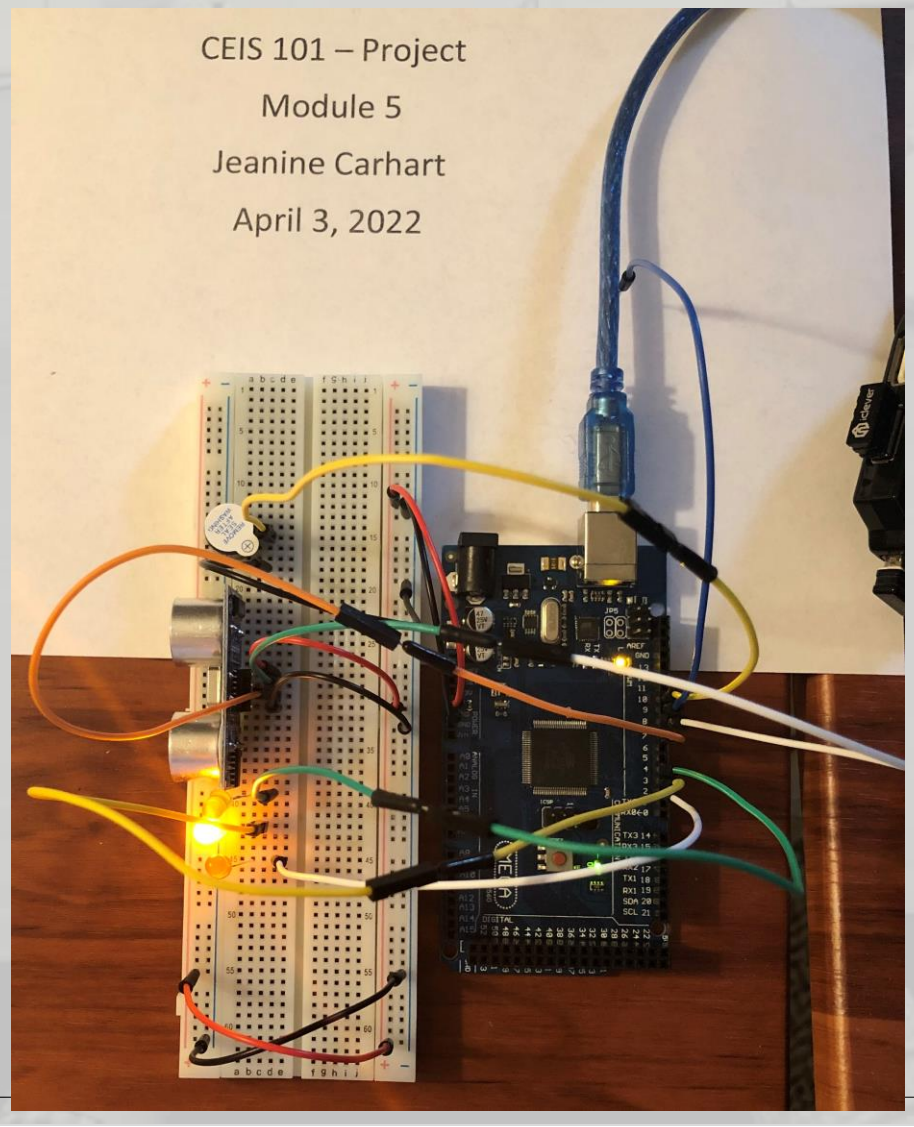
Week 5: Adding the Distance Sensor

- Circuit with Green LED
- Circuit with Yellow LED
- Circuit with Red LED
- Arduino Code
- Data Chart

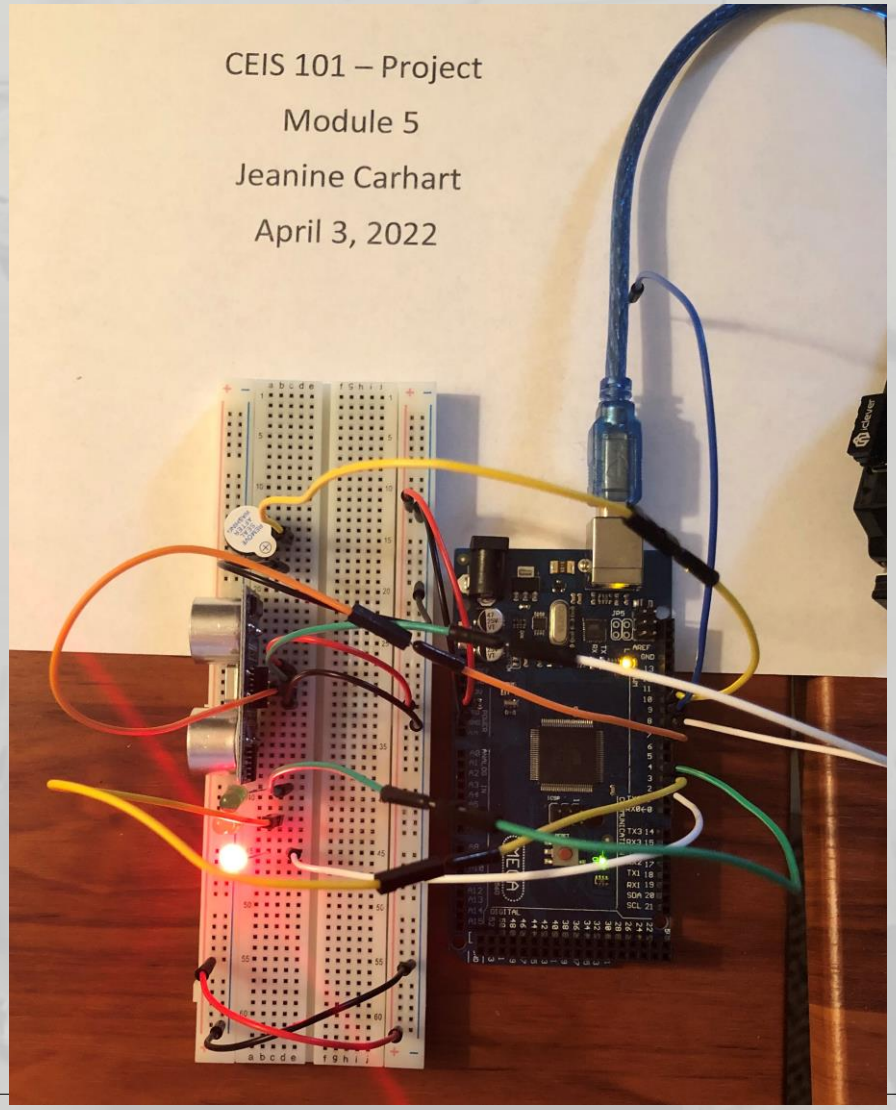
Project 1: Circuit with Green LED



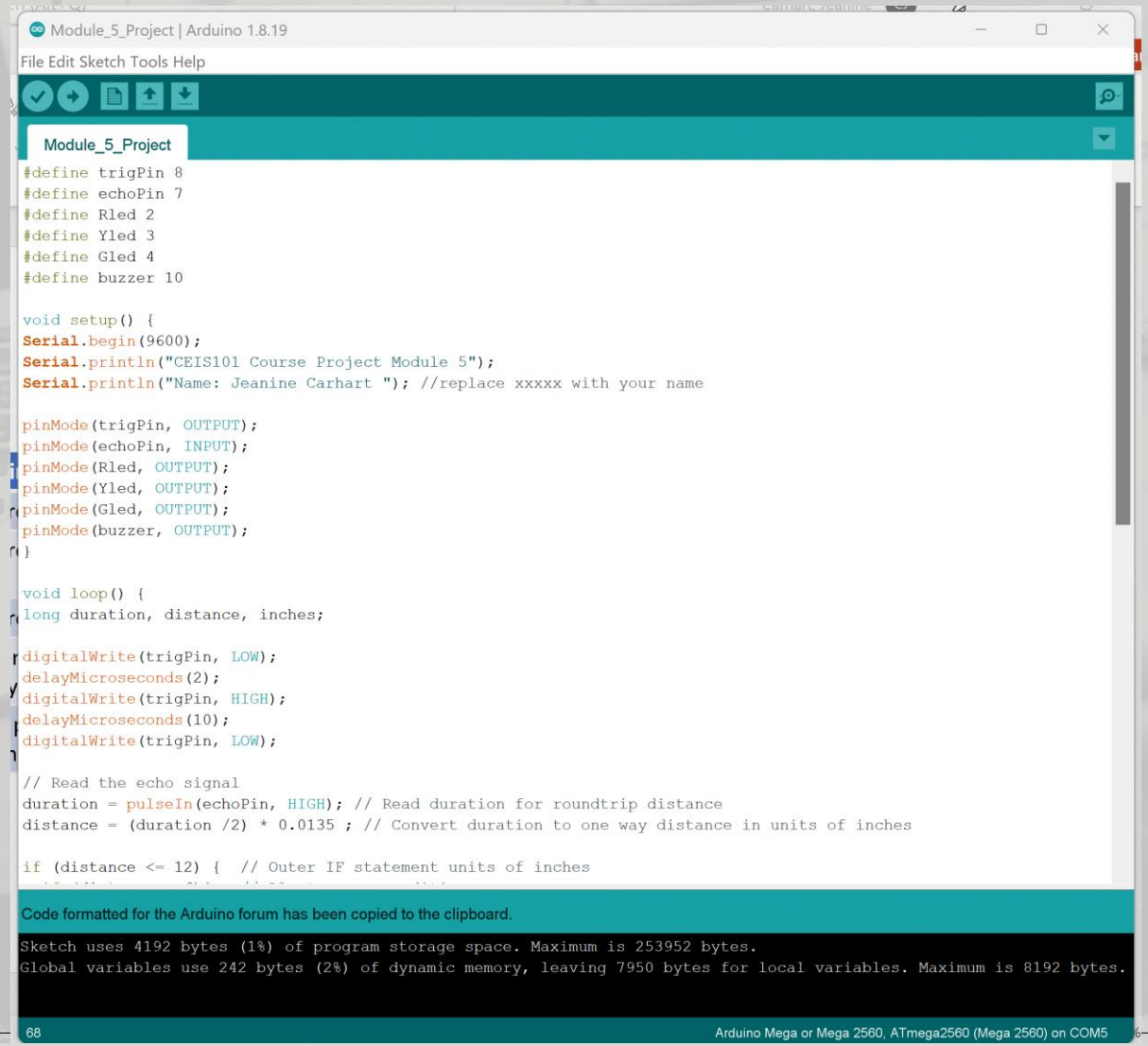
Project 1: Circuit with Yellow LED



Project 1: Circuit with Red LED

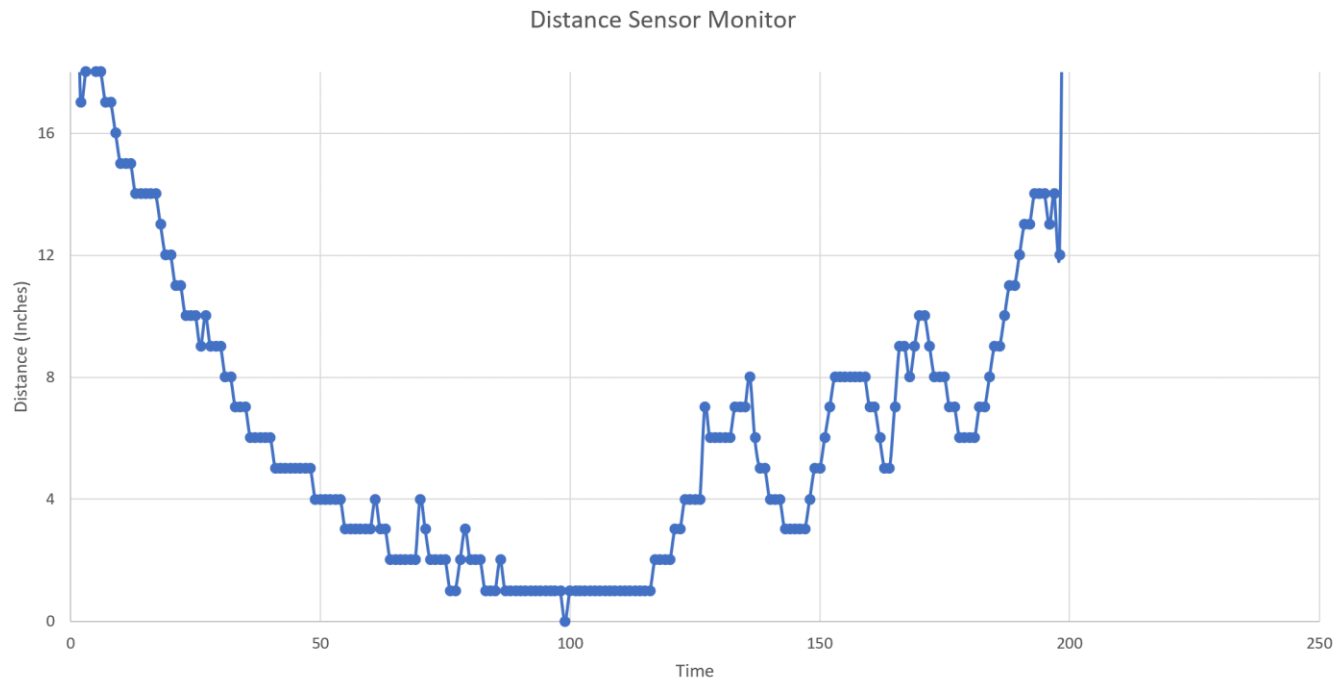


Project 1: Circuit with Arduino Code



Project 1: Data Chart

Data Plot: Distance Sensor Monitor



Week 6: Objectives

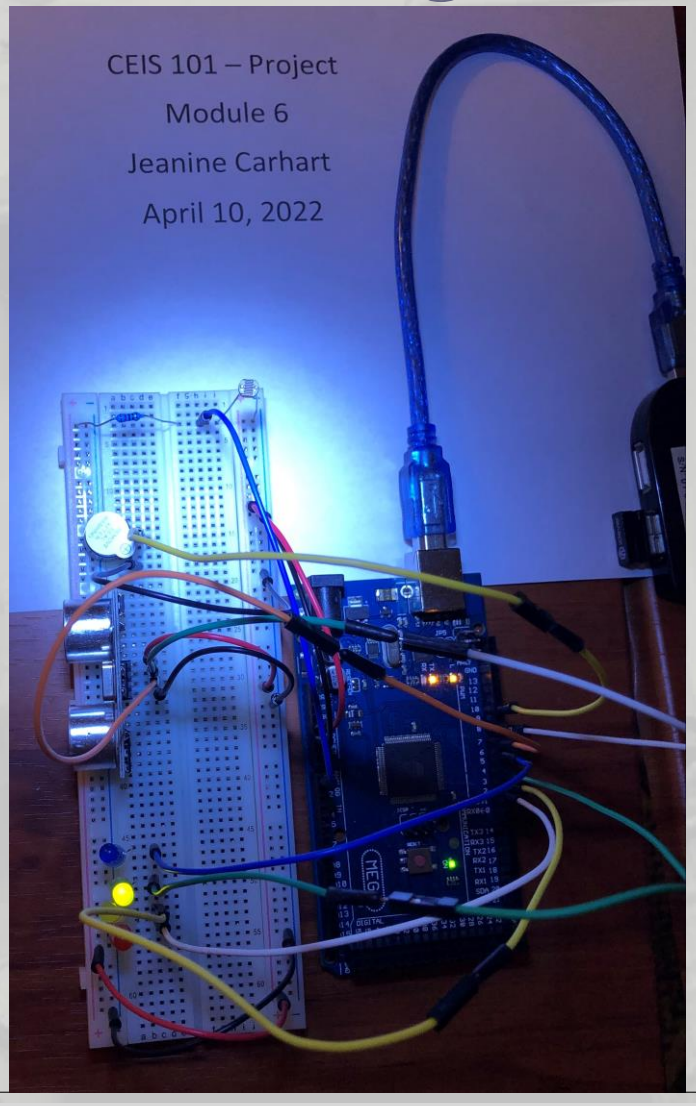
- To learn how to connect a light sensor to the Mega 2560 board
- To learn how to write code that uses a light sensor
- To learn how to write code that turns on light based on the reading from the light sensor

Week 6: Adding Automated Light

- Automated Light On
- Automated Light Off
- Arduino Code
- Serial Monitor

Project 1: Automated Light On

Project 1: Automated Light Off



Project 1: Arduino Code

Module_6_Project | Arduino 1.8.19

File Edit Sketch Tools Help

Module_6_Project

```
#define trigPin 8
#define echoPin 7
#define Rled 2
#define Yled 3
#define Gled 4
#define buzzer 10
#define photocell A0
#define autoLight 6

void setup() {
Serial.begin(9600);
Serial.println("CEIS101 Course Project Module 6");
Serial.println("Name: Jeanine Carhart "); //replace xxxxx with your name

pinMode(trigPin, OUTPUT);
pinMode(echoPin, INPUT);
pinMode(Rled, OUTPUT);
pinMode(Yled, OUTPUT);
pinMode(Gled, OUTPUT);
pinMode(buzzer, OUTPUT);
pinMode(autoLight, OUTPUT);
}

void loop() {
//=== Automated Light ===
int value=analogRead(photocell); // Read the value from the light sensor to determine condition

//Serial.println(value); uncomment this line and open serial plotter to see the effect of light

if (value > 450) {
 digitalWrite(autoLight, HIGH);
 Serial.println("The automated light is ON");
}
else {
digitalWrite(autoLight, LOW);
}
```

```
Sketch uses 4122 bytes (1%) of program storage space. Maximum is 253952 bytes.
Global variables use 294 bytes (3%) of dynamic memory, leaving 7898 bytes for local variables. M
```

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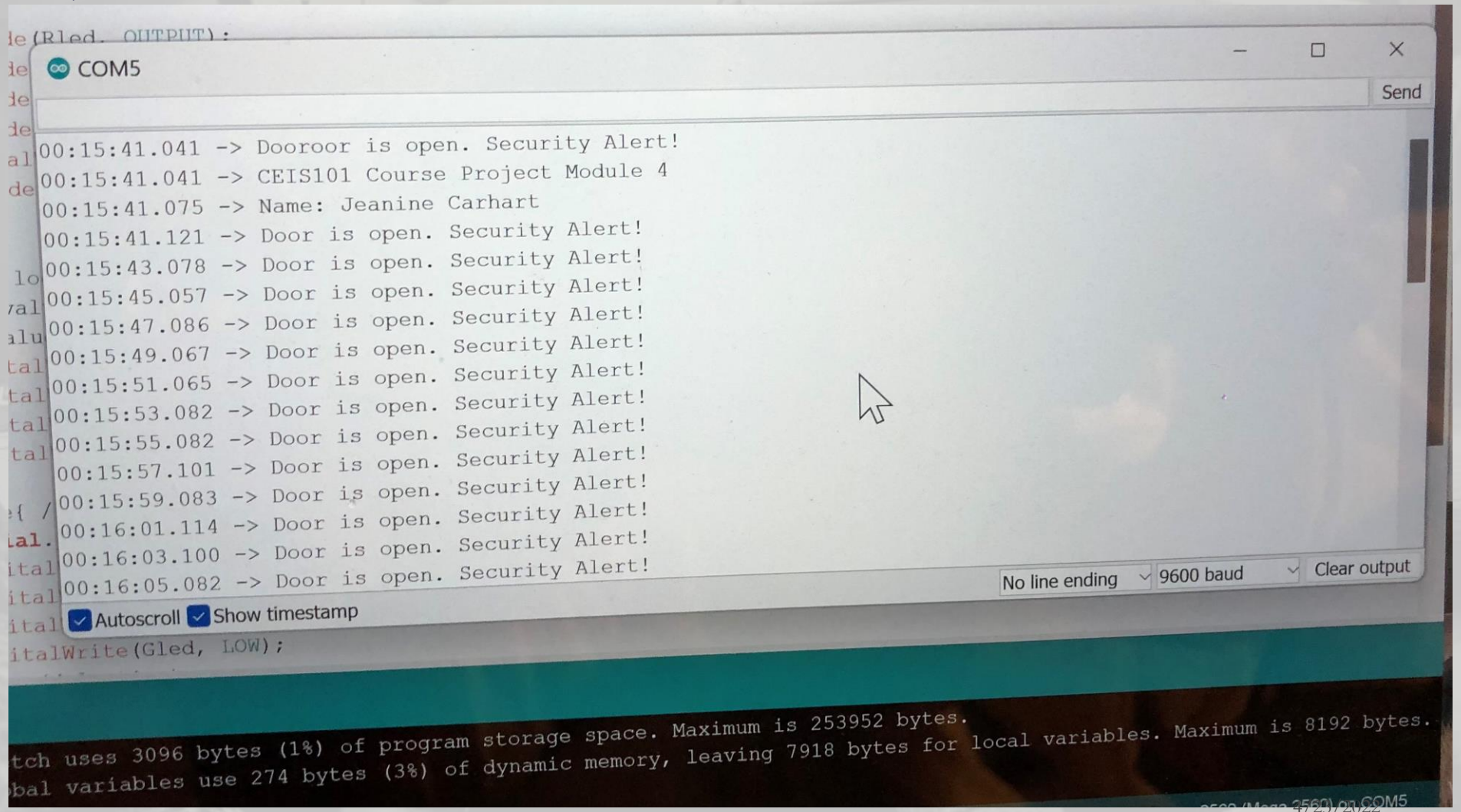
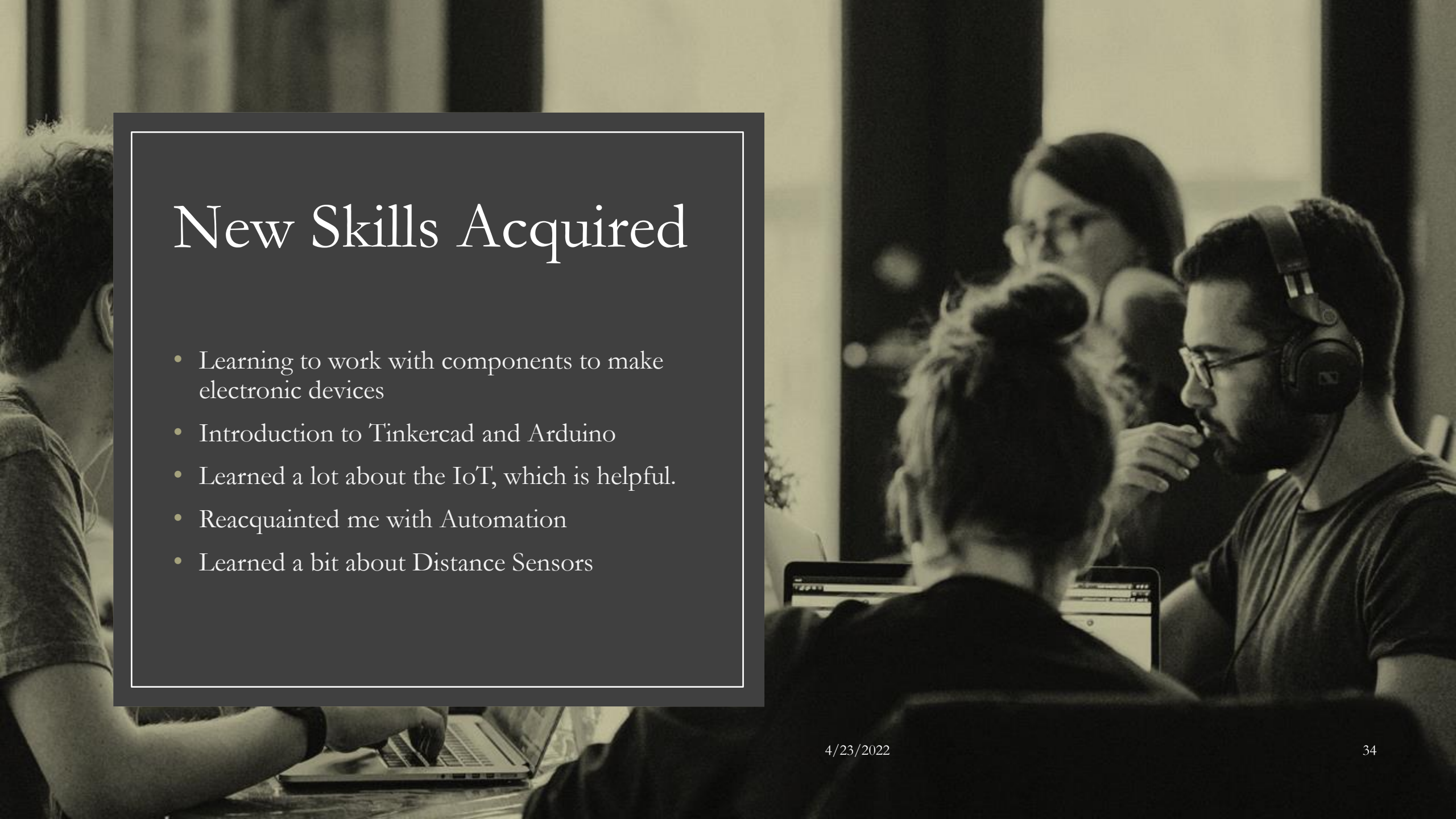
Project 1: Serial Monitor



Project Challenges

- Module 3 – Arduino IDE and Chrome didn't want to work together. Uninstalling and re-installing version 1.8.19 finally got it running.
- The yellow light blinked continuously when it wasn't supposed to and the red light wouldn't light up at all for several hours.
- No resolution from the Huddle or from consultation with a couple professors. Listening to the class recording brought up a point that I decided to try, so I shut down Arduino and restarted, loaded the code and it finally came on!
- No other real issues that I couldn't handle.



New Skills Acquired

- Learning to work with components to make electronic devices
- Introduction to Tinkercad and Arduino
- Learned a lot about the IoT, which is helpful.
- Reacquainted me with Automation
- Learned a bit about Distance Sensors

Project Summary

- This class was so enjoyable! I'd never heard of Tinkercad or Arduino, so working with it was a treat. I'll be using both to create something soon.
- It was nice to discover that I actually liked working with circuit boards and wires to see if I could make a device work.
- Doing a bit of coding was a good way to prep us for our next class, Python.

THANK YOU!

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