CEIS101 COURSE PROJECT SMART HOME AUTOMATION AND SECURITY SYSTEM

Presented by: Deven Williams

INTRODUCTION

This six-part course project fundamentally addresses skills required to integrate hardware, software, and networks into a complete system. The end state produces an IoT device capable of simulating smart home automation and home security. An IoT Tech Core Kit was used for the hardware and component requirements. The protype was developed utilizing an online 3D modeling program called Tinkercad. The programming was executed using an open-source electronic platform called Arduino IDE. The device offers varying features designed to equip the user with home monitoring and security. Some of these features include distance monitoring with intruder alerts, open/closed door alerts and security light automation for night time protection.

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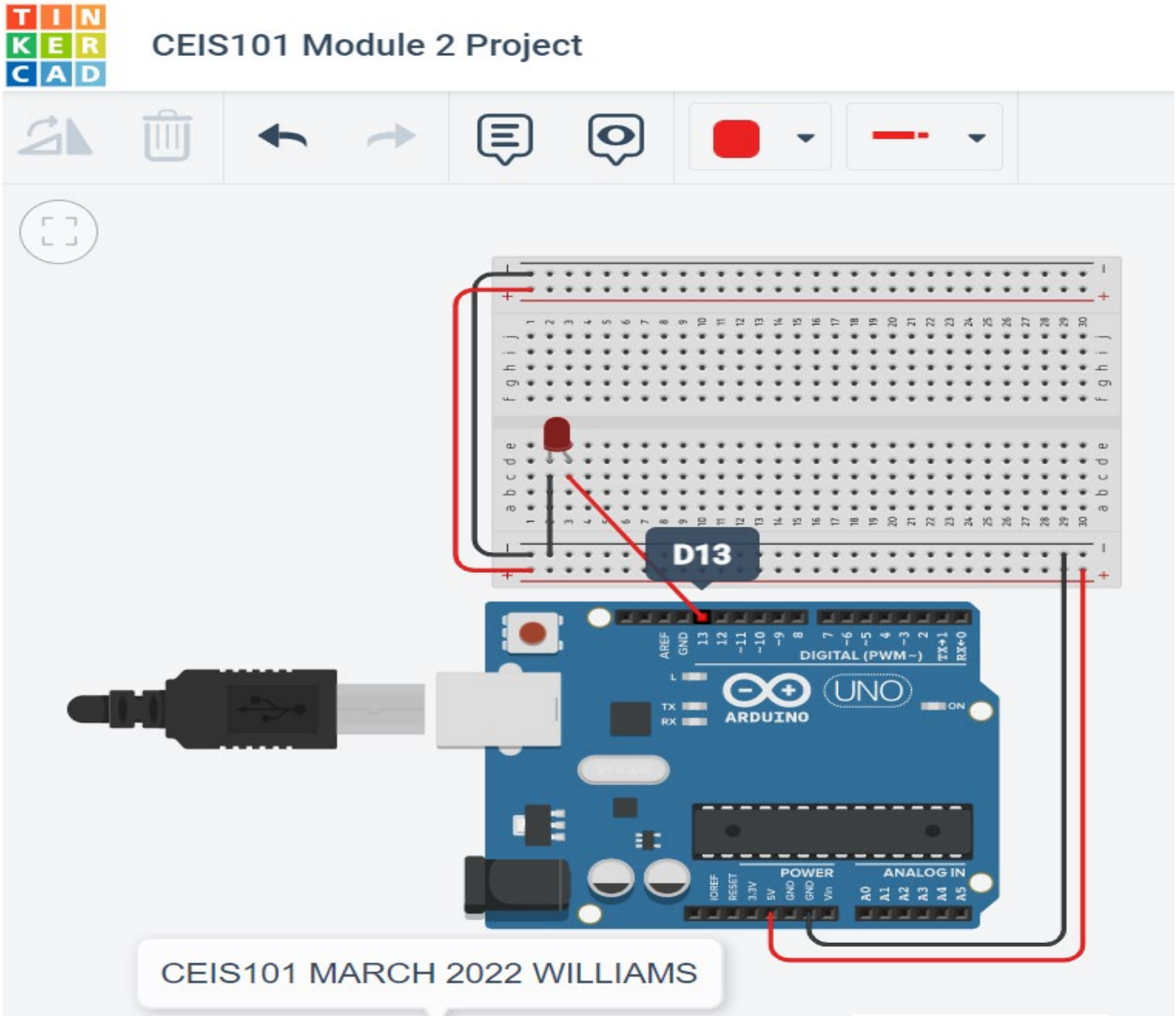
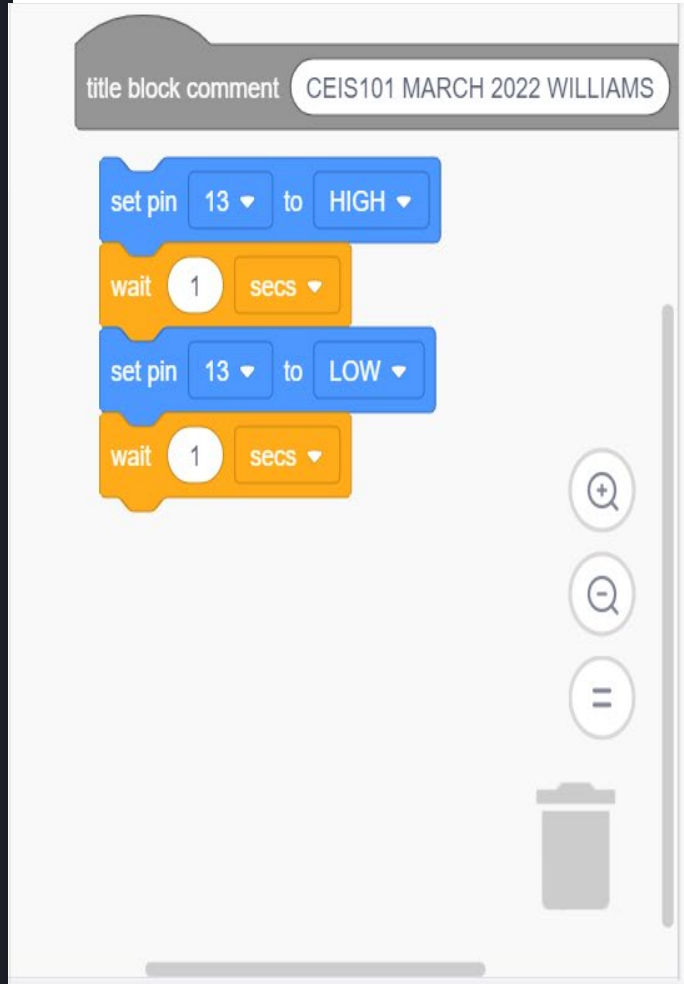
CIRCUIT SIMULATION IN TINKERCAD

CIRCUIT (SCREENSHOT) BLINKING LED LIGHT



CODE (SCREENSHOT) BLINKING LED LIGHT




```
// C++ code
//
/*
  CEIS101 MARCH 2022 WILLIAMS
*/

void setup()
{
  pinMode(13, OUTPUT);
}

void loop()
{
  digitalWrite(13, HIGH);
  delay(1000); // Wait for 1000 millisecond(s)
  digitalWrite(13, LOW);
  delay(1000); // Wait for 1000 millisecond(s)
}
```

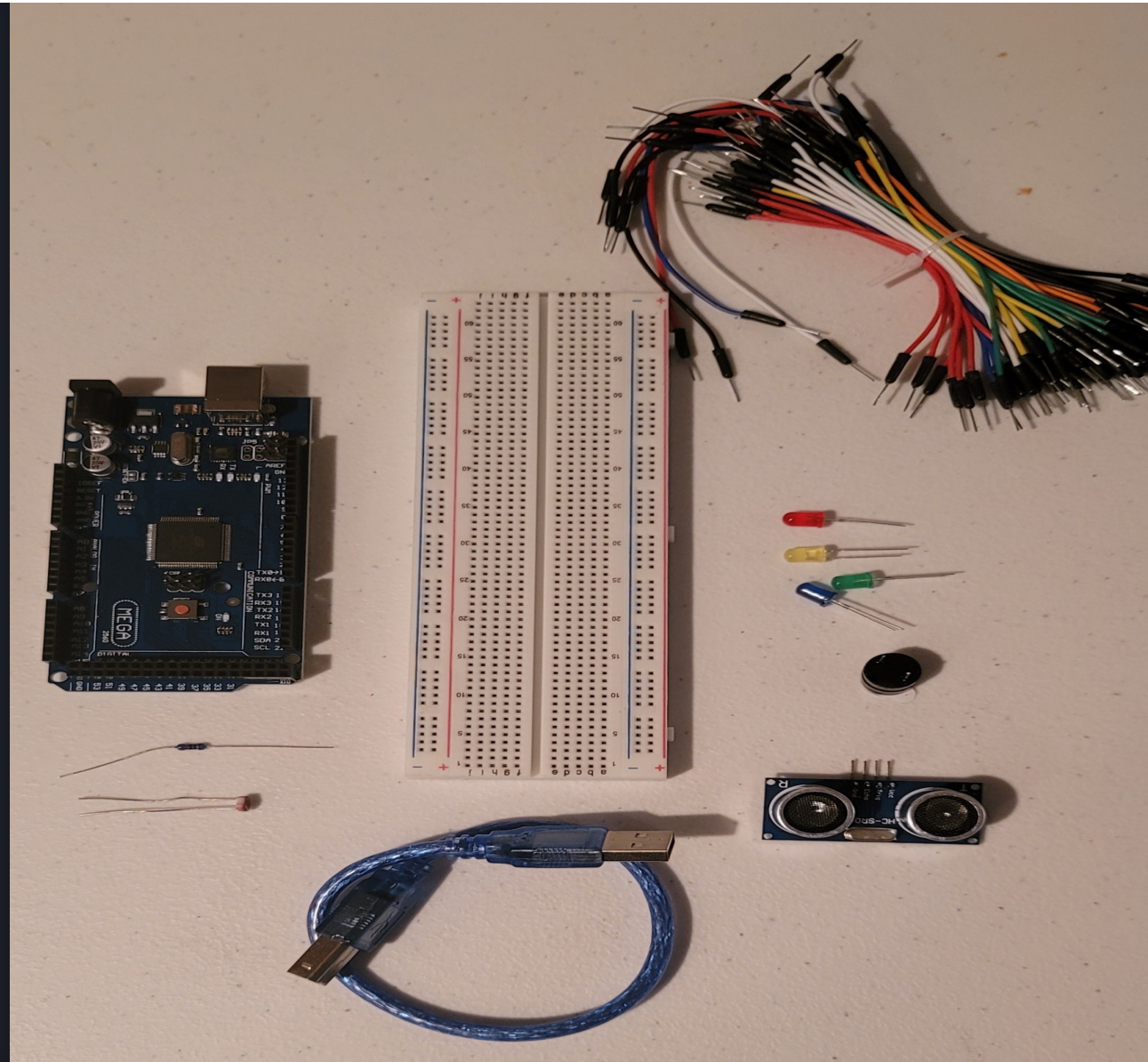
INVENTORY OF PARTS, CIRCUIT BUILDING AND DISPLAYING MESSAGES

INVENTORY OF IOT KIT (PICTURE)

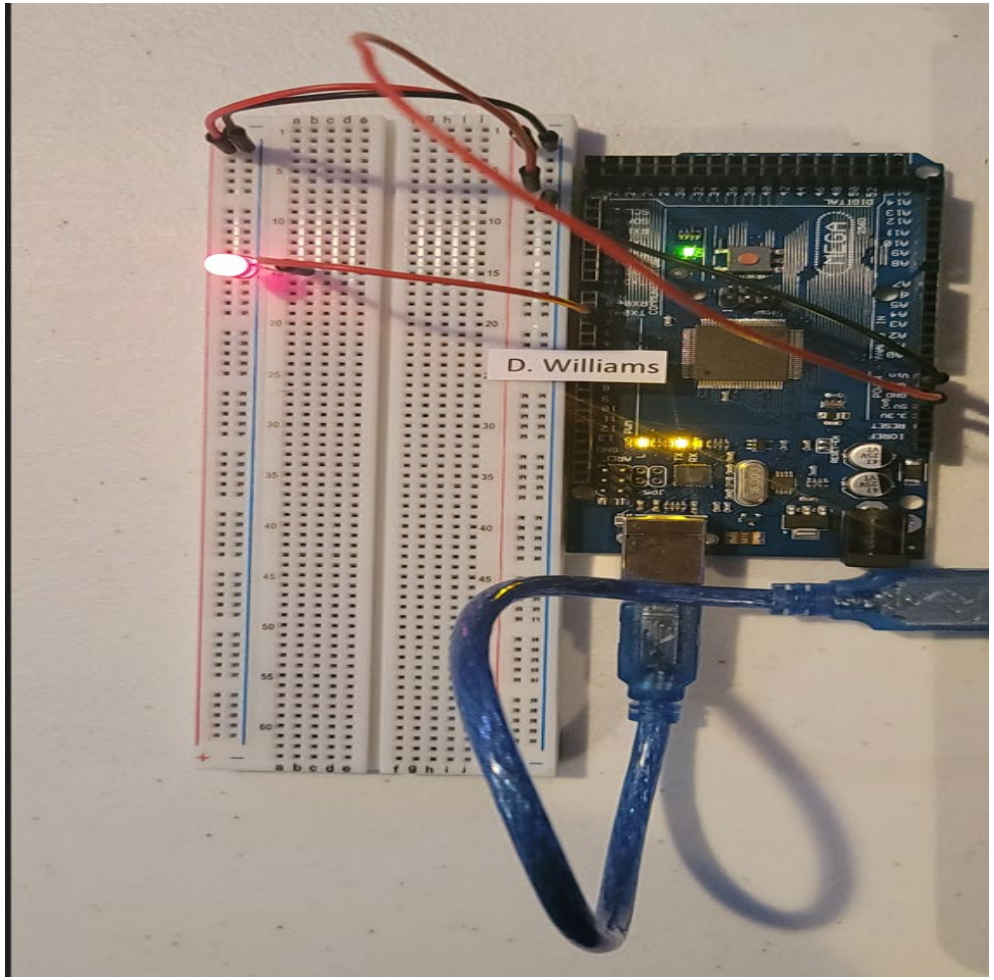
- UCTRONICS Kit
- ESP32 (2)
- LCD Modules (2)
- Breadboards (3)
- Mini Router
- Patch Cable
- Digital Multi Meter
- USB to Micro USB (2)

ORGANIZATION OF PROJECT COMPONENTS (PICTURE)

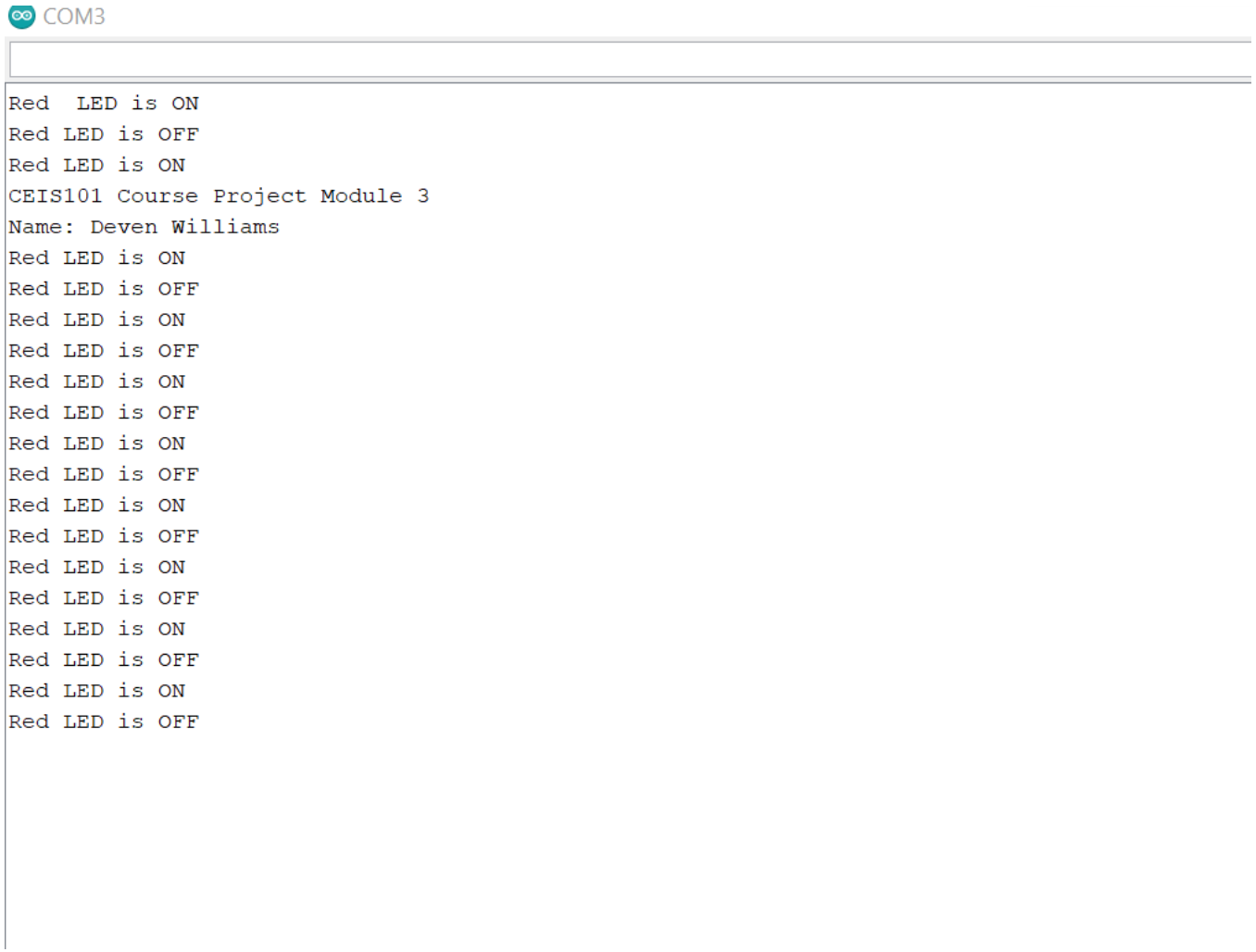
- Arduino Mega 2560
- Breadboard
- Resistor 10kΩ
- LEDs
- Ultrasonic Sensor
- Active Buzzer
- Photoresistor
- Wires
- USB Type B cable



CIRCUIT WITH RED LED ON (PICTURE)

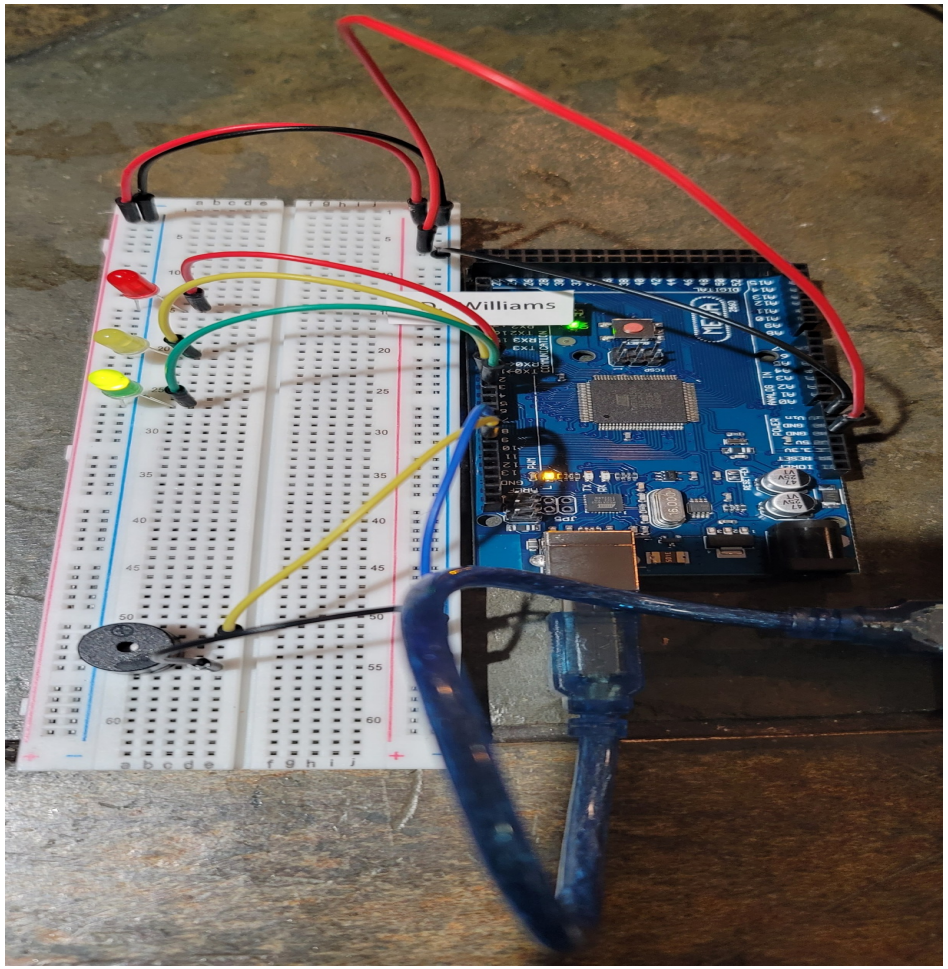


SERIAL MONITOR (SCREENSHOT)

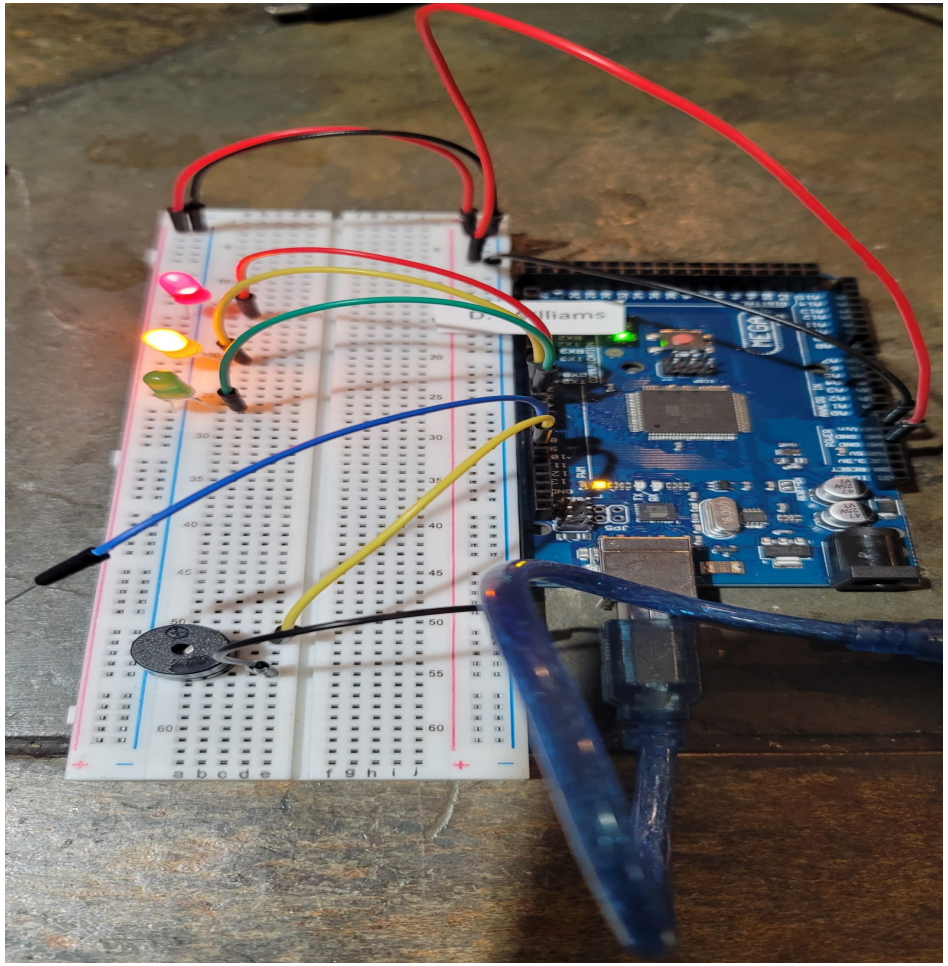


ADDING DOOR SENSOR TO SMART HOME SYSTEM

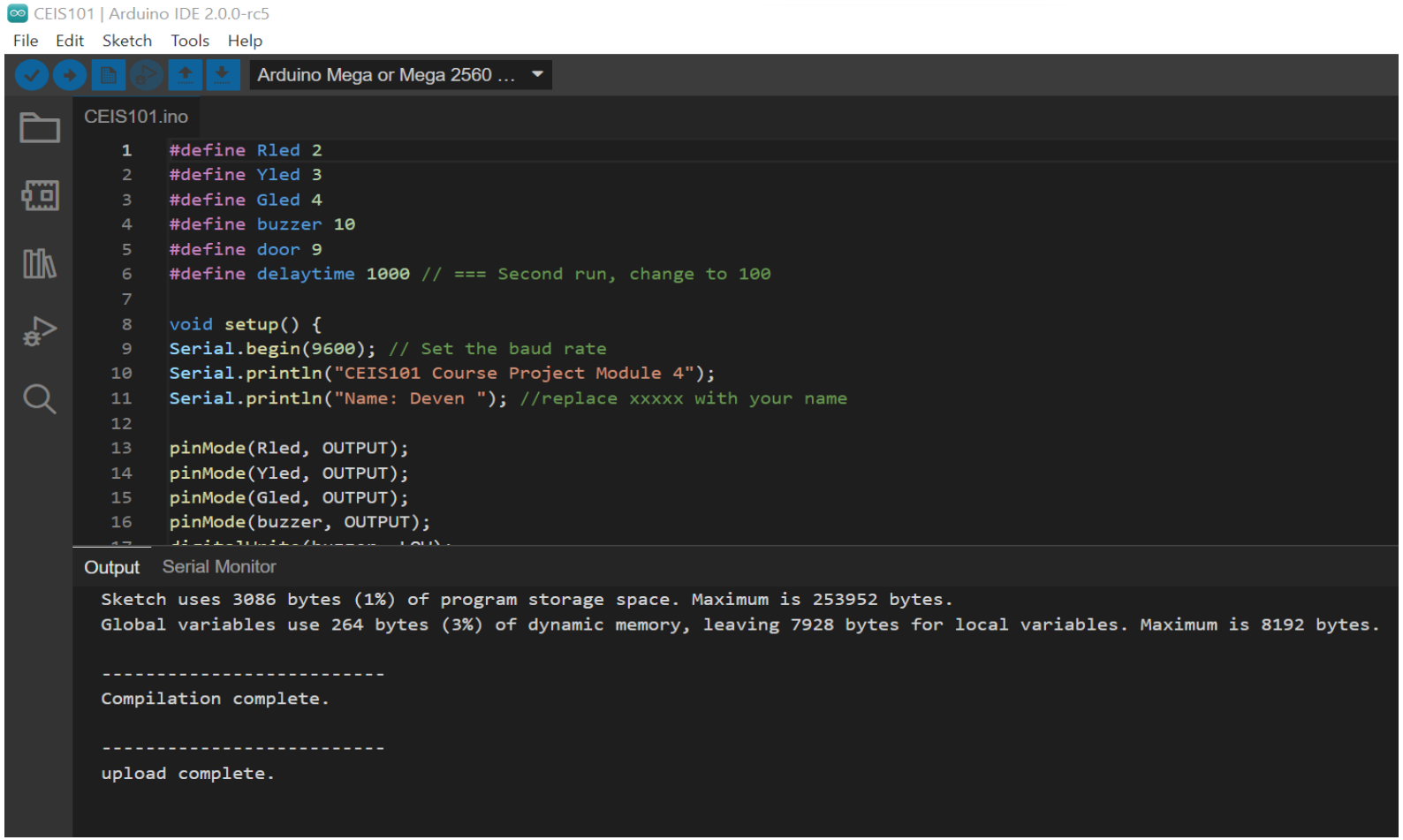
CIRCUIT OF DOOR CLOSED WITH GREEN LED ON (PICTURE)



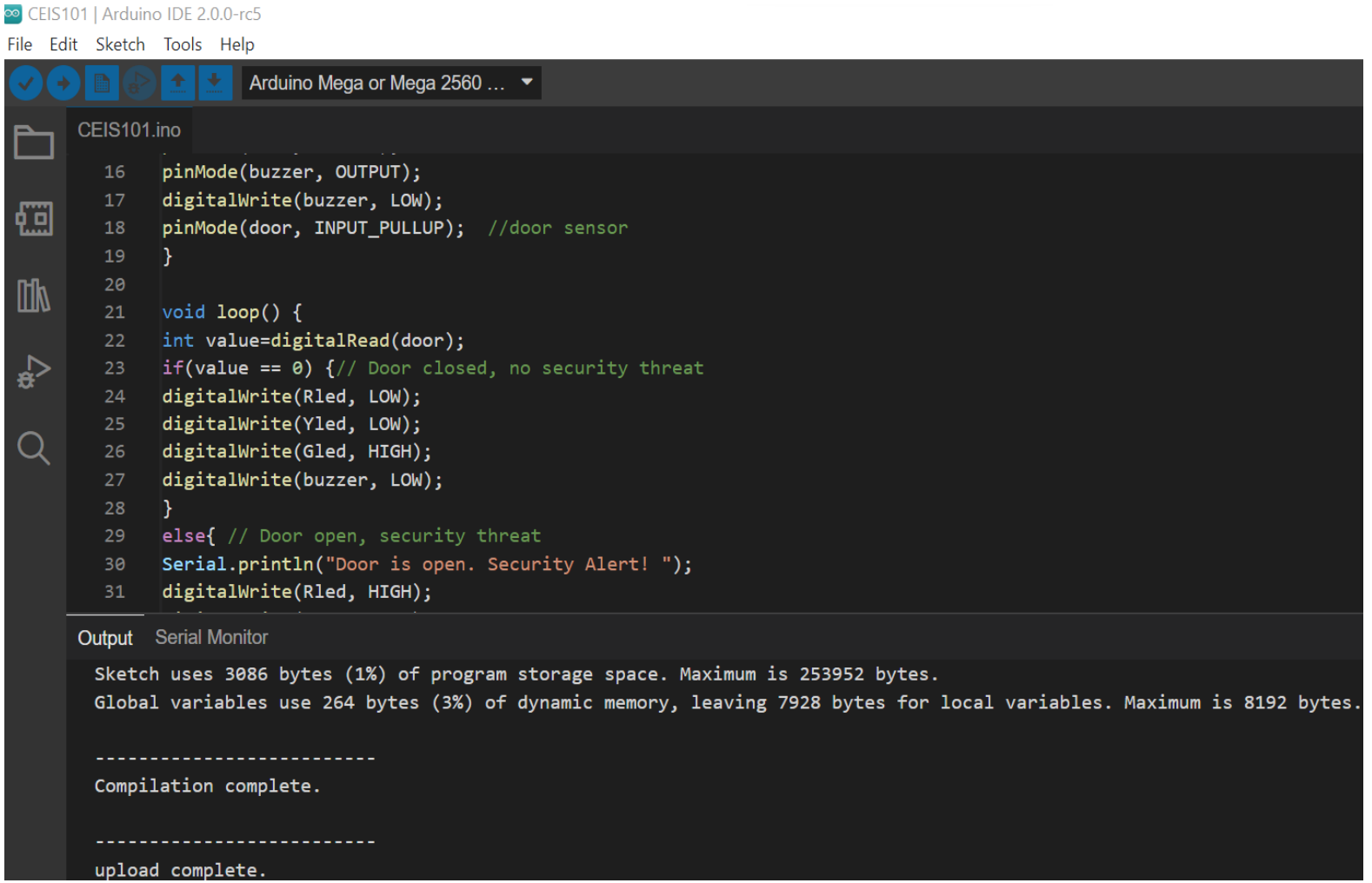
CIRCUIT OF DOOR OPEN WITH GREEN LED OFF (PICTURE)



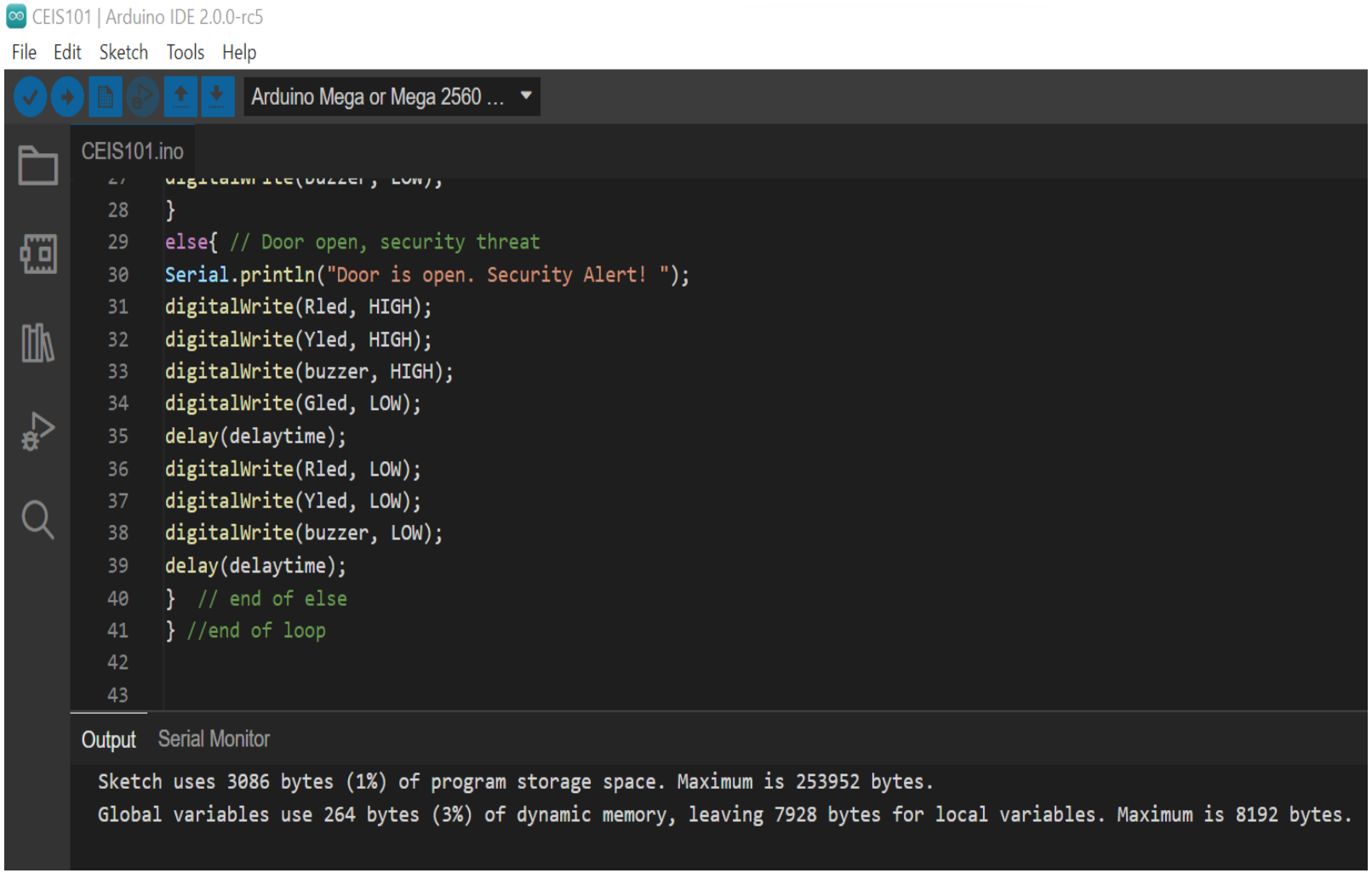
ARDUINO CODE (SCREENSHOT) 1 OF 3



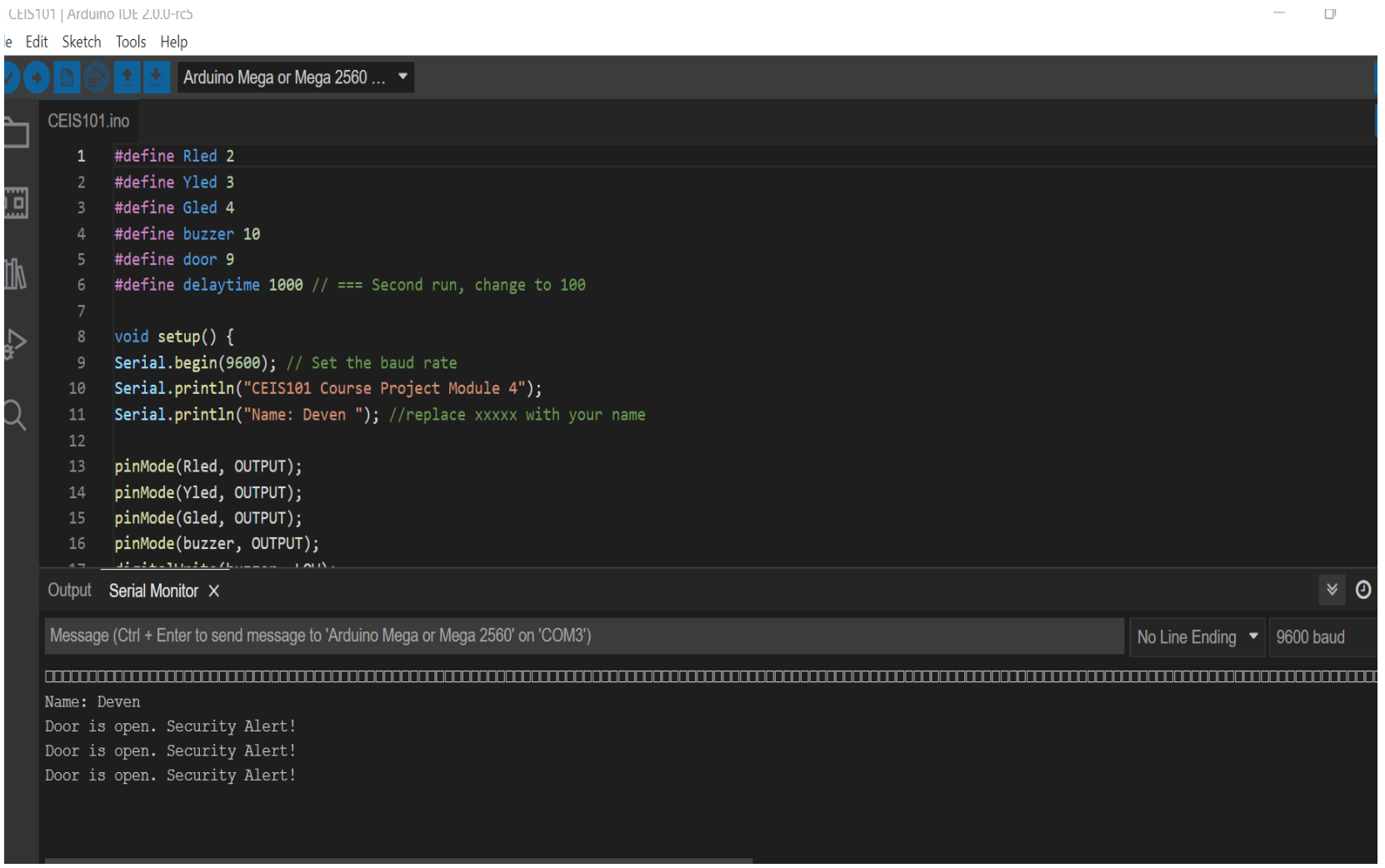
ARDUINO CODE (SCREENSHOT) 2 OF 3



ARDUINO CODE (SCREENSHOT) 3 OF 3

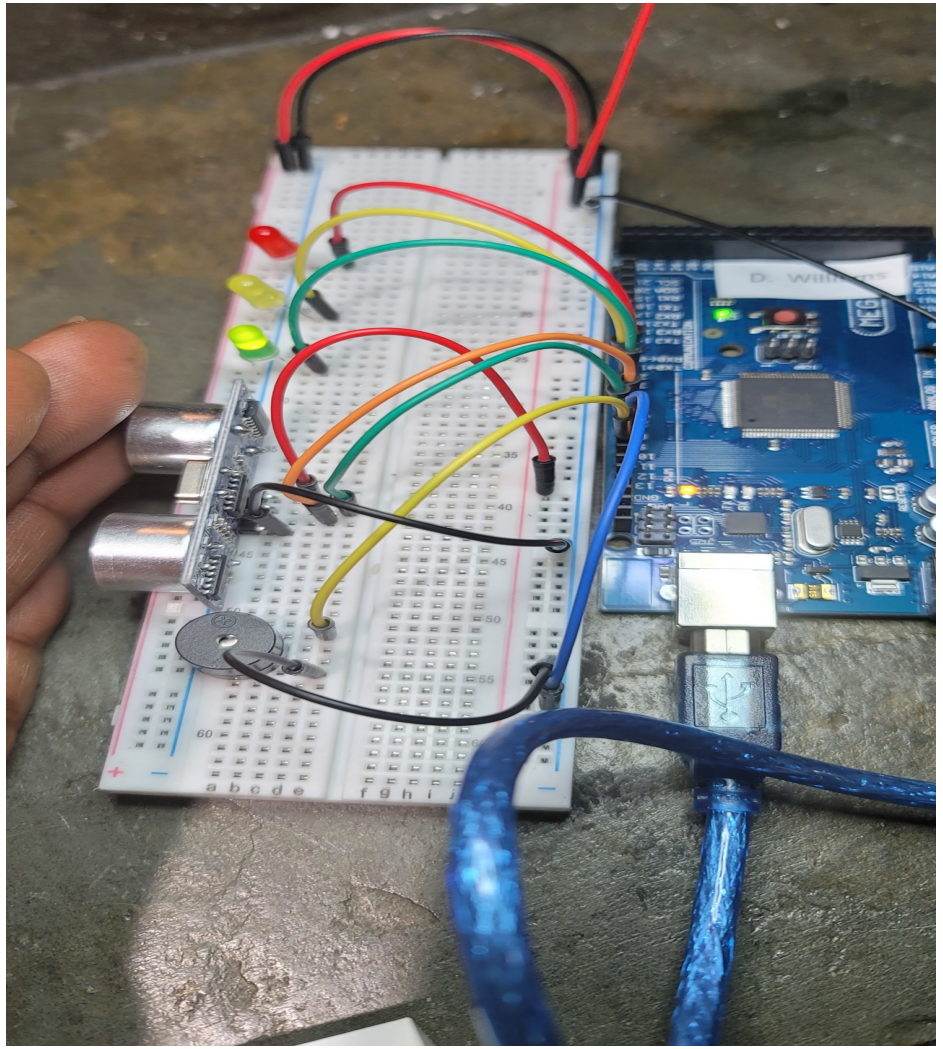


SERIAL MONITOR (SCREENSHOT)

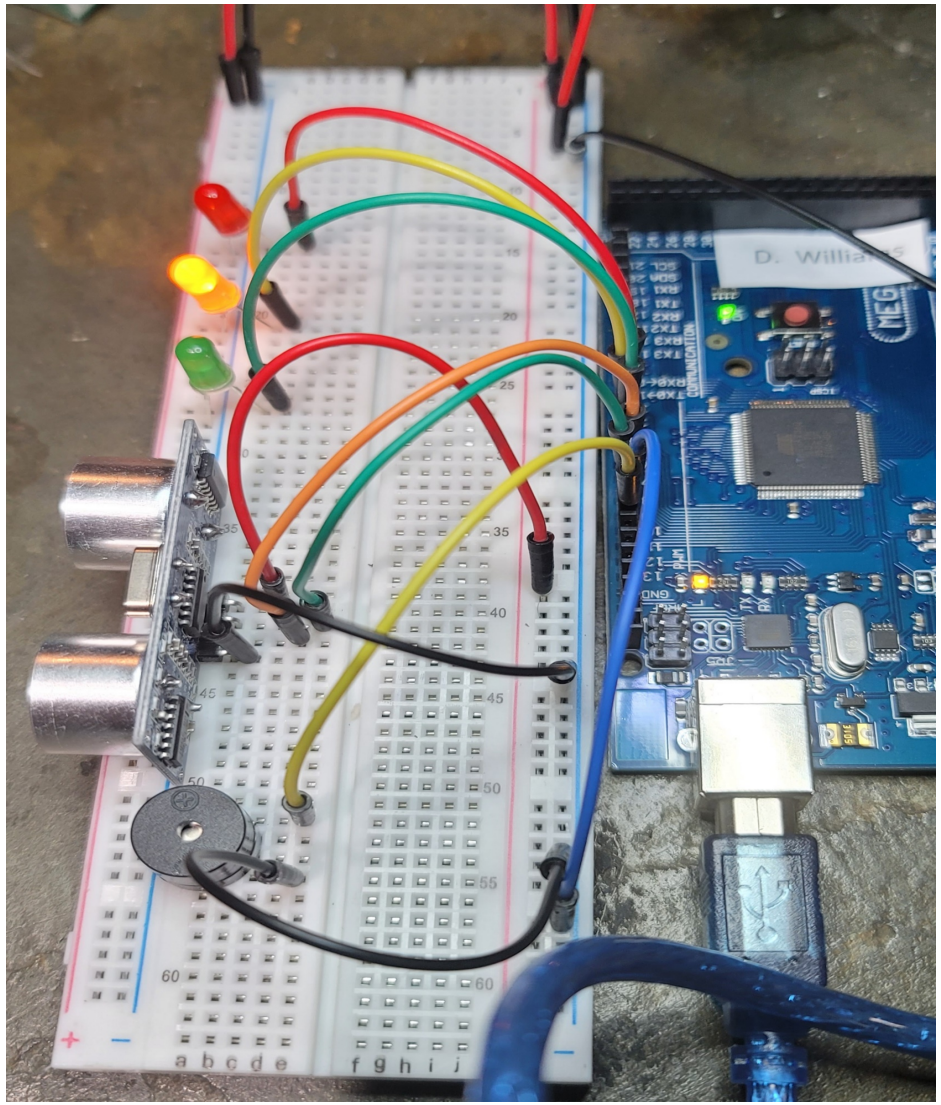


ADDING DISTANCE SENSOR TO SMART HOME SYSTEM AND CONDUCT DATA ANALYSIS

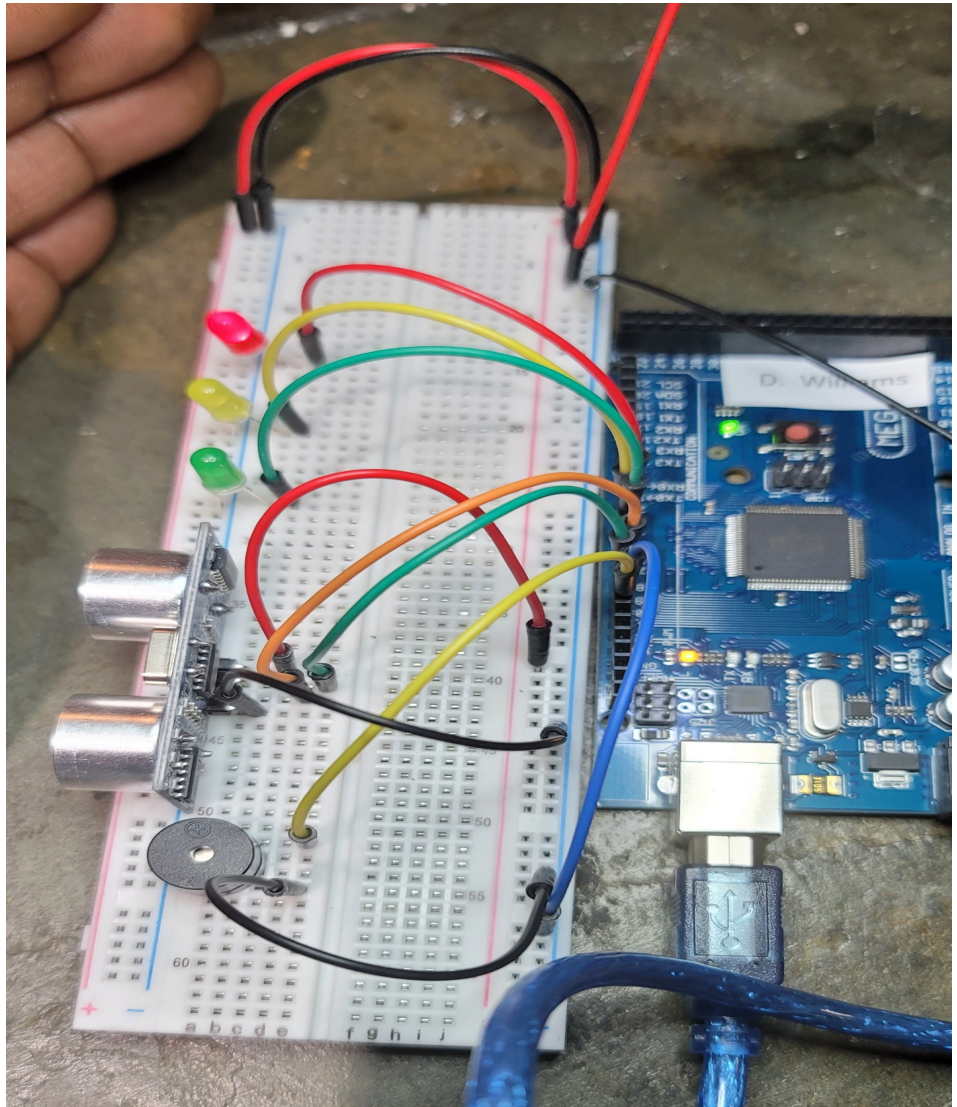
CIRCUIT WITH GREEN LED ON (PICTURE)



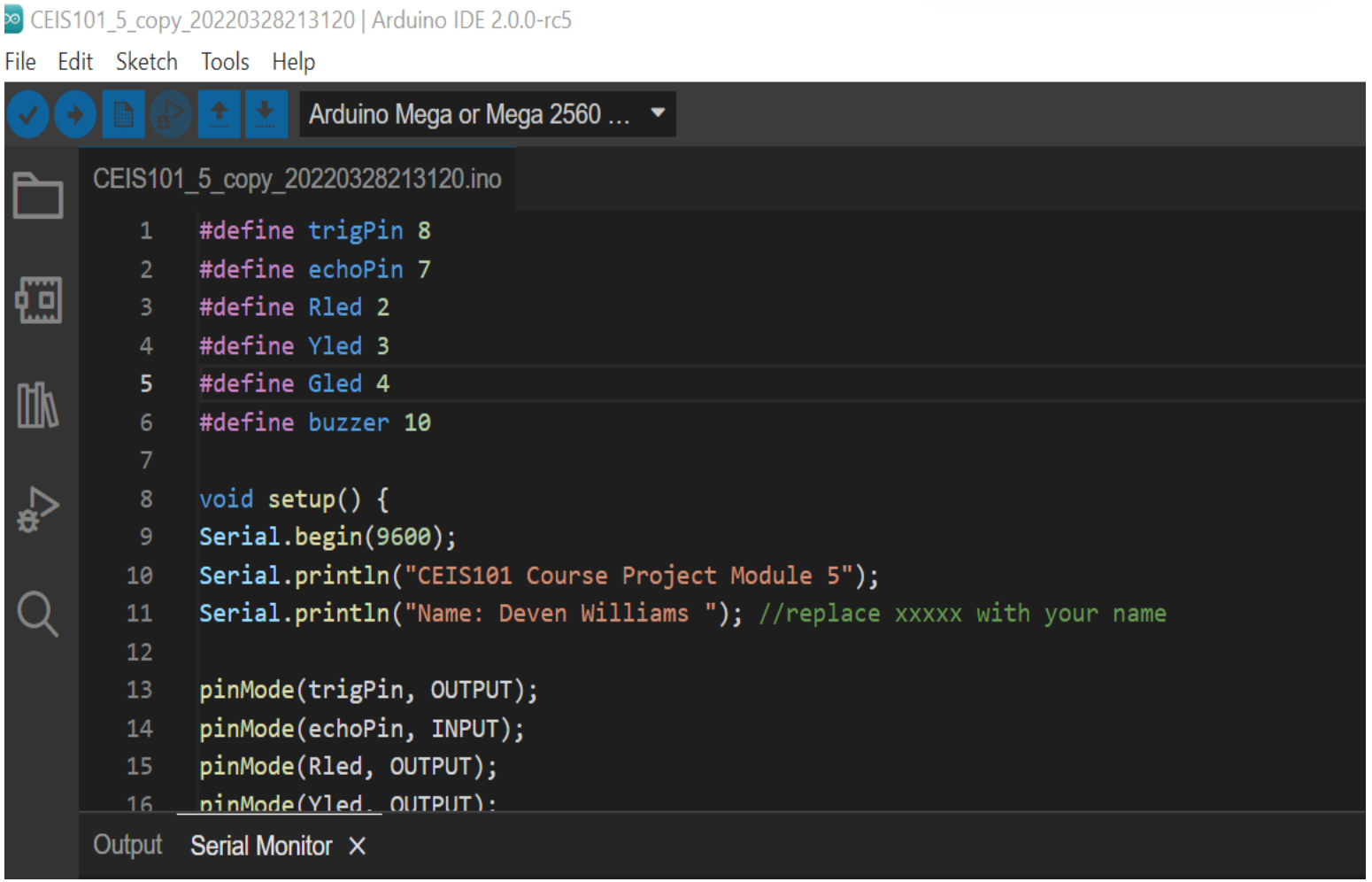
CIRCUIT WITH YELLOW LED ON (PICTURE)



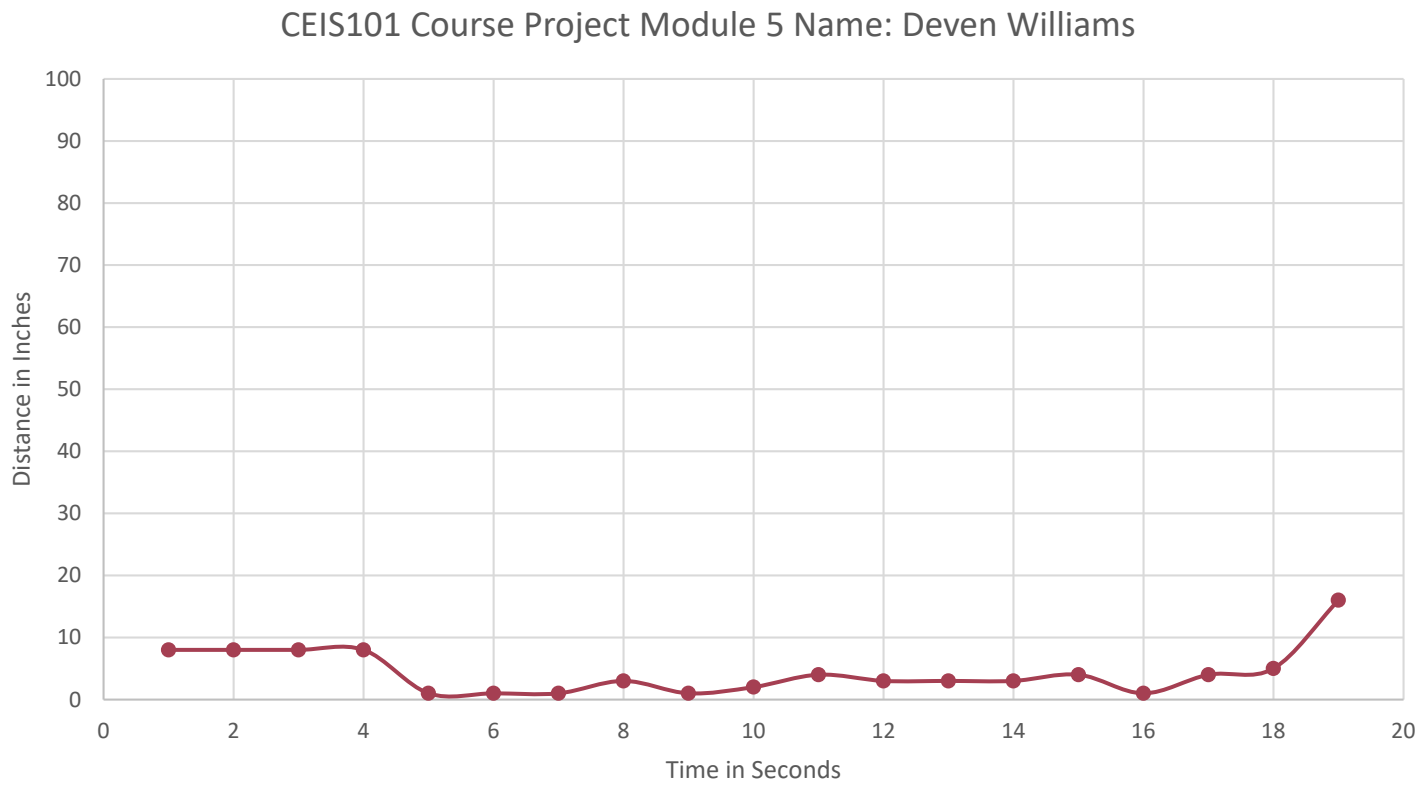
CIRCUIT WITH RED LED ON (PICTURE)



ARDUINO CODE (SCREENSHOT)

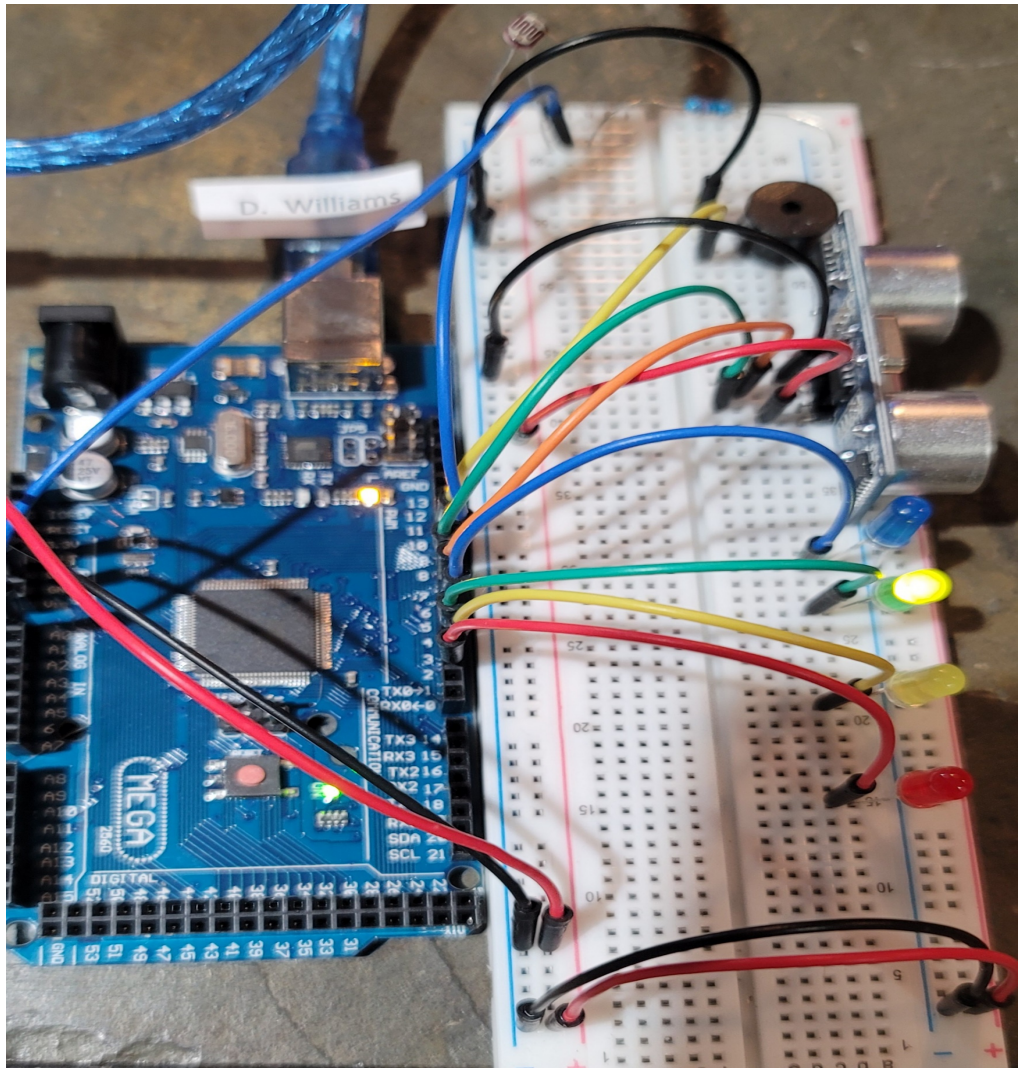


PLOT OF DATA (GRAPH FROM EXCEL)

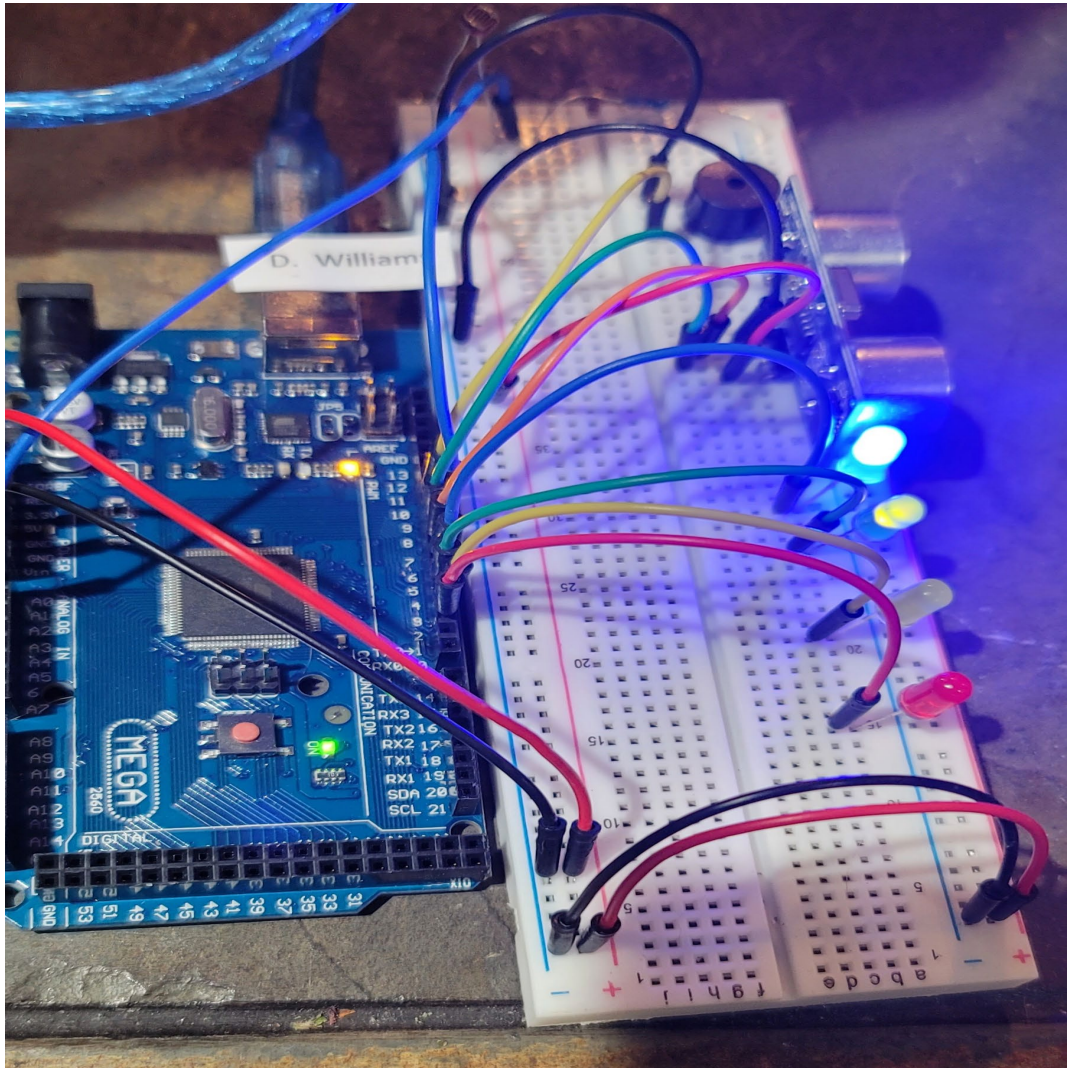


ADDING AUTOMATED LIGHT TO SMART HOME SECURITY SYSTEM

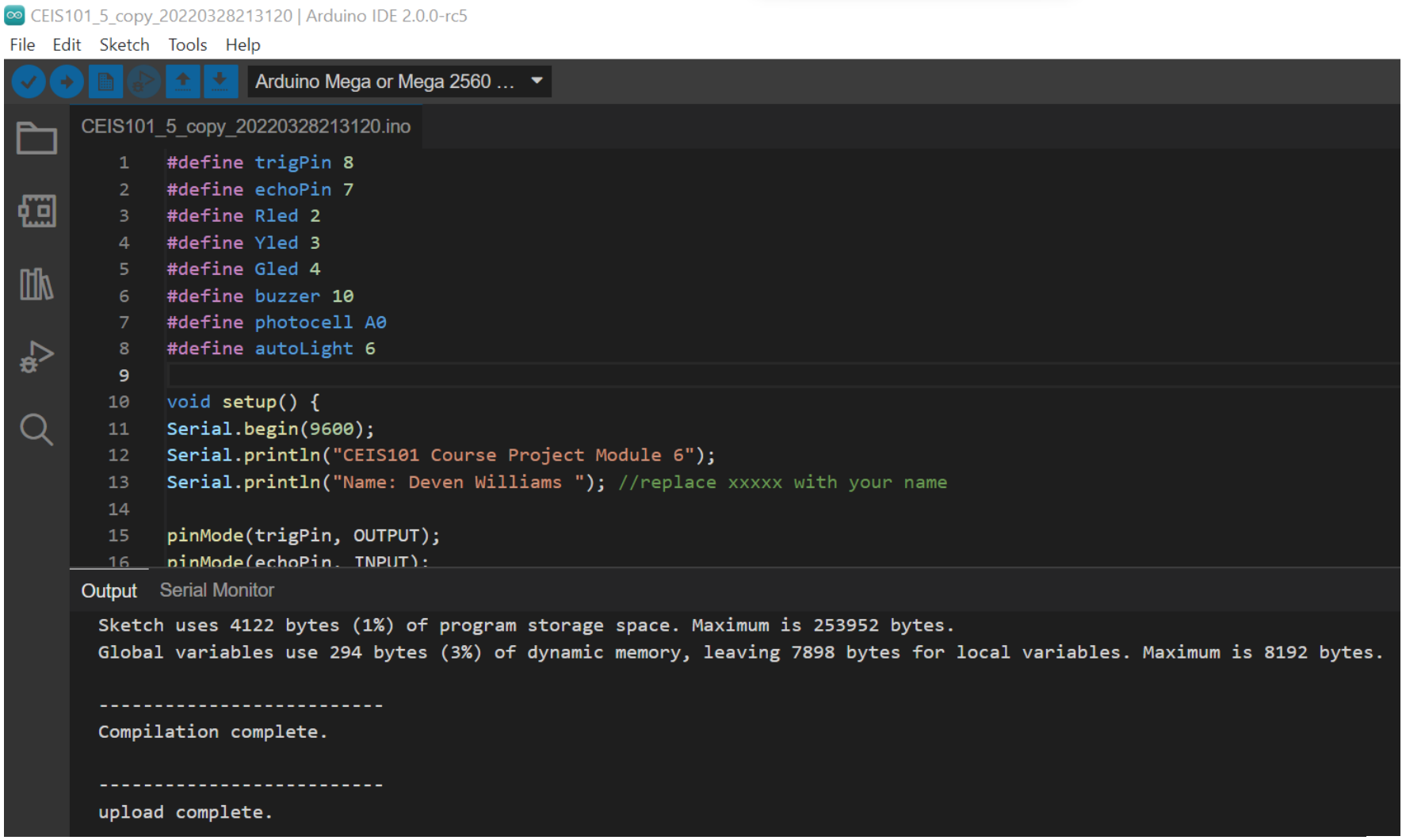
CIRCUIT WITH AUTOMATED BLUE LED OFF (PICTURE)



CIRCUIT WITH AUTOMATED BLUE LED ON (PICTURE)



ARDUINO CODE (SCREENSHOT)



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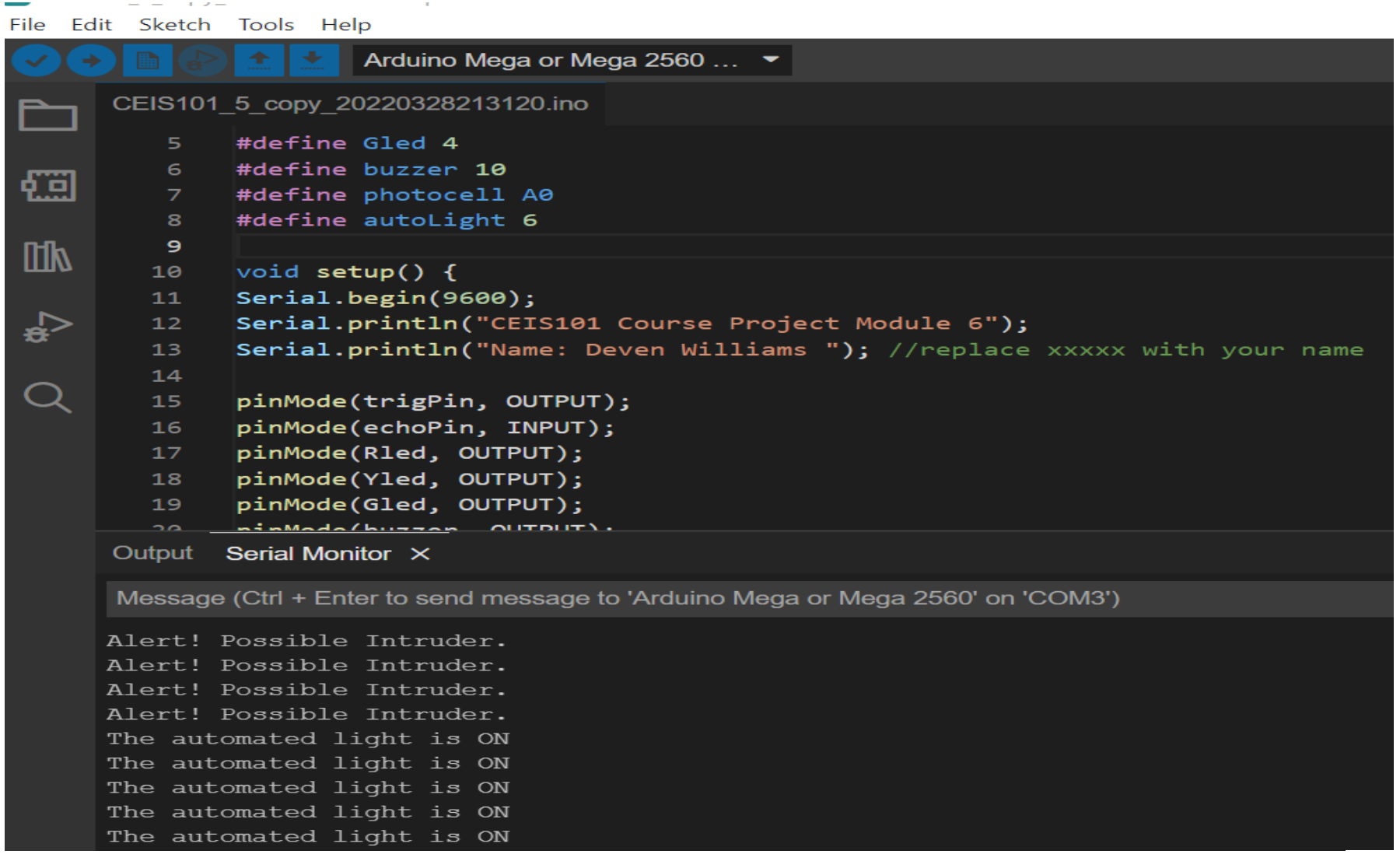

CHALLENGES

With any project there will undoubtedly be obstacles or challenges that arise. The unfamiliarity with the associated hardware, software, and execution tools stood challenging at first. The importance of understanding your resources was never clearer and more evident. Actions were taken to learn, understand and apply these resources . This resulted in an increased level of self-efficacy that laid the foundation for a successful project submission.

CAREER SKILLS ACQUIRED

The pursuit of becoming a Technologist and Technical Manager persists. Several technical skills were present during this project. Mastery of these skills is and should always be the goal. Gains were made in the following areas:

- Organizational Skills
- Attention to Detail
- Resource development
- Backwards engineering
- Programming
- Troubleshooting

CONCLUSION

In conclusion, this project shines light on the power of the willingness to learn. If you have that willingness, coupled with proper tools and a passion to contribute to a better society, then the sky is the limit. The IoT community is ever-growing and with that growth new issues will surface. We must stand ready to mitigate these issues with regard to technology. This project is but a simple representation of that desire and how we can use technology to protect our most valued possessions.

THANK YOU

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