Conclusion:

As we traversed through our software/hardware project, we had many obstacles to overcome. When we started, we brainstormed ideas and set goals for ourselves to complete the task of creating a digital power switch that could power a block heater for a vehicle. Our first goal was to wire and code a temperature sensor to read out temperatures. In order to do this we had to learn python. Our next goal to reach was to figure out how to get power from the raspberry pi to turn something on. We used this idea to turn on a light which we thought could be swapped to a relay later on. Once we had each code written separately, we needed to figure out how they could be combined to get the light to turn on at a certain temperature. With some simple thinking, we lead to the idea of using if statements.

The next big goal or what the next step would be is to change the light to some sort of relay. The relay would hopefully be able to turn on an outlet to power the heating block. The issue for this is that we think the raspberry pi does not have enough power. The raspberry pi only runs on a 3.3 V system which is not enough to power a 120 V outlet. Hopefully the use of a relay could trigger something else to turn on an exterior power source which would go to the outlet.

Materials:

- ➢ Raspberry Pi
- ➢ DHT11 temperature/humidity sensor
- ➢ Light bulb
- ➢ Axial leaded resistor
- ➢ 2 male-male wires
- ➢ 5 male-female wires

Future materials

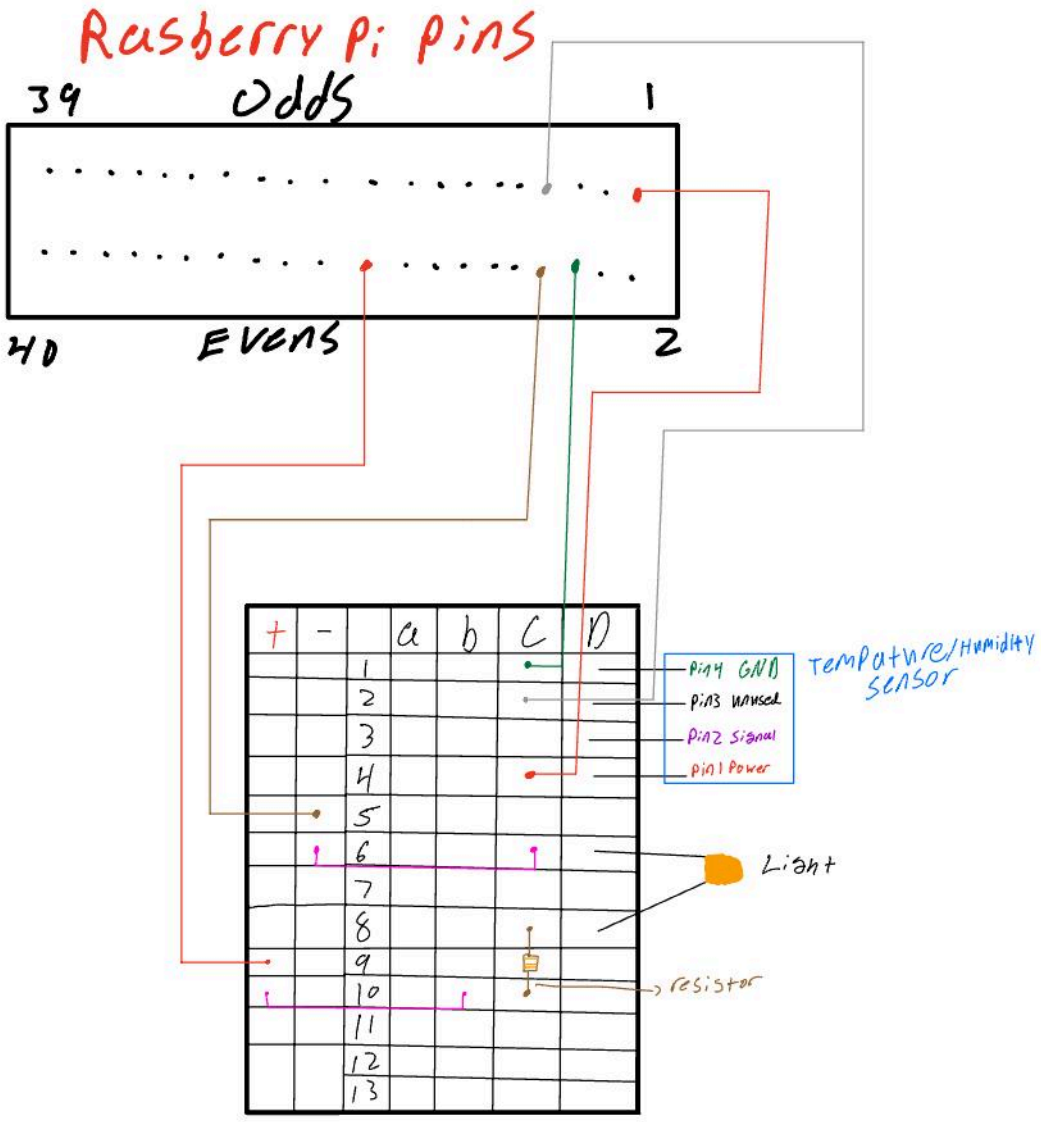
- ➢ 4-pin Raspberry Pi relay
- ➢ 120 V outlet
- ➢ 120 volt wire

Works Cited

https://raspberrypihq.com/making-a-led-blink-using-the-raspberry-pi-and-python/
https://pimylifeup.com/raspberry-pi-dht11-sensor/

Presentation Video

https://my.yuja.com/V/Video?v=13004644&node=56299006&a=163619979


Rasberry Pi pins
39
Odds
1
40
Evens
2
+
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a
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1
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6
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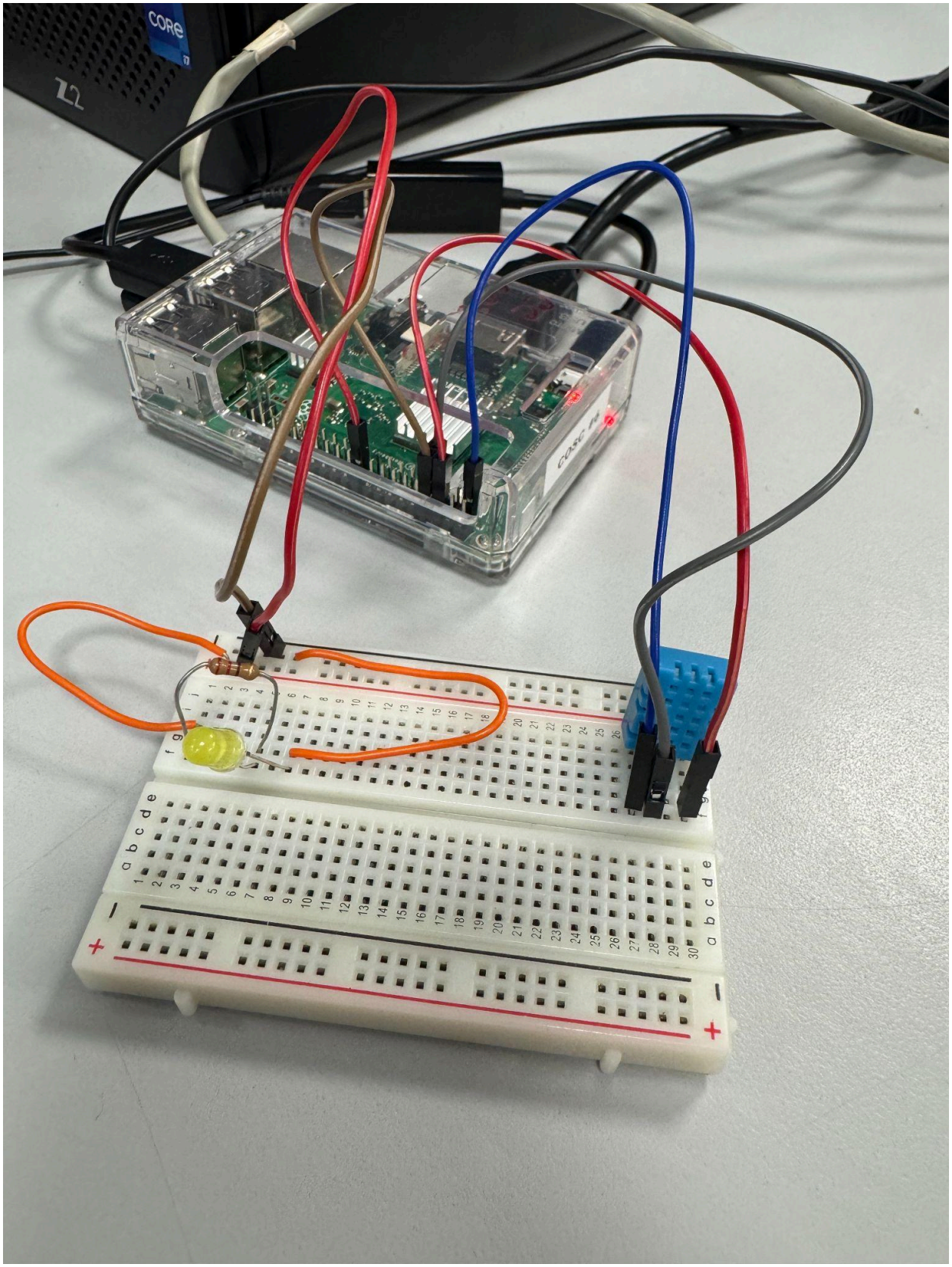
9
10
11
12
13
Pin4 GND
Pin3 unused
Pin2 Signal
Pin1 Power
Temperature/Humidity sensor
Light
resistor


CORE

Problems:

The Main problems we had were figuring out the gpio pins on the raspberry pi and how they worked within our code. Since we had a light and temperature sensor that were supposed to use the same pin we had to figure out which pin we could use instead of one of the pins already being used on the raspberry pi. This process took a lot of surfing the internet to find out which pin we could use and how we could write our code accordingly. We also struggled with getting the linux environment to work for us the way we wanted to. We ended up having to use an “env source bin”. Overall we were able to overcome our problems but to continue with this project we would have many more problems to overcome.

Future advice:

For future students doing this project we would suggest finding a website for the dht11 and just going with it. Once you have it reading temperature readings the code is easy to change to get it what you want to do. Also we would suggest researching the relays and just buying one because if we had one of the relays sooner we probably would have been able to figure out how to incorporate the relay into our system. We would also suggest writing out a timeline and sticking to it because if we would’ve been able to stick to a timeline we would have finished the relay part of the project.