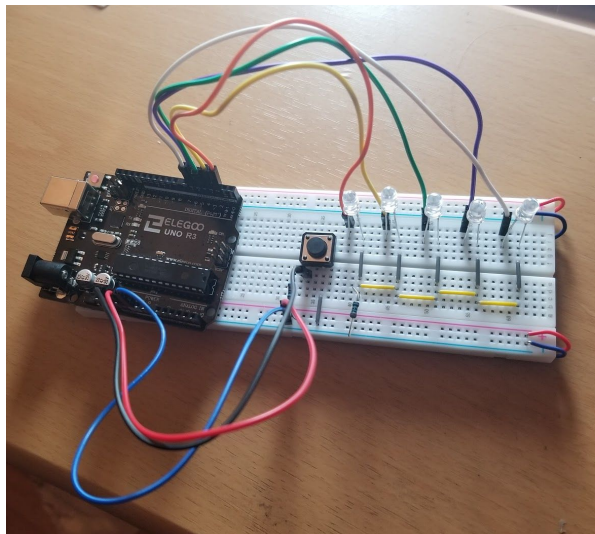
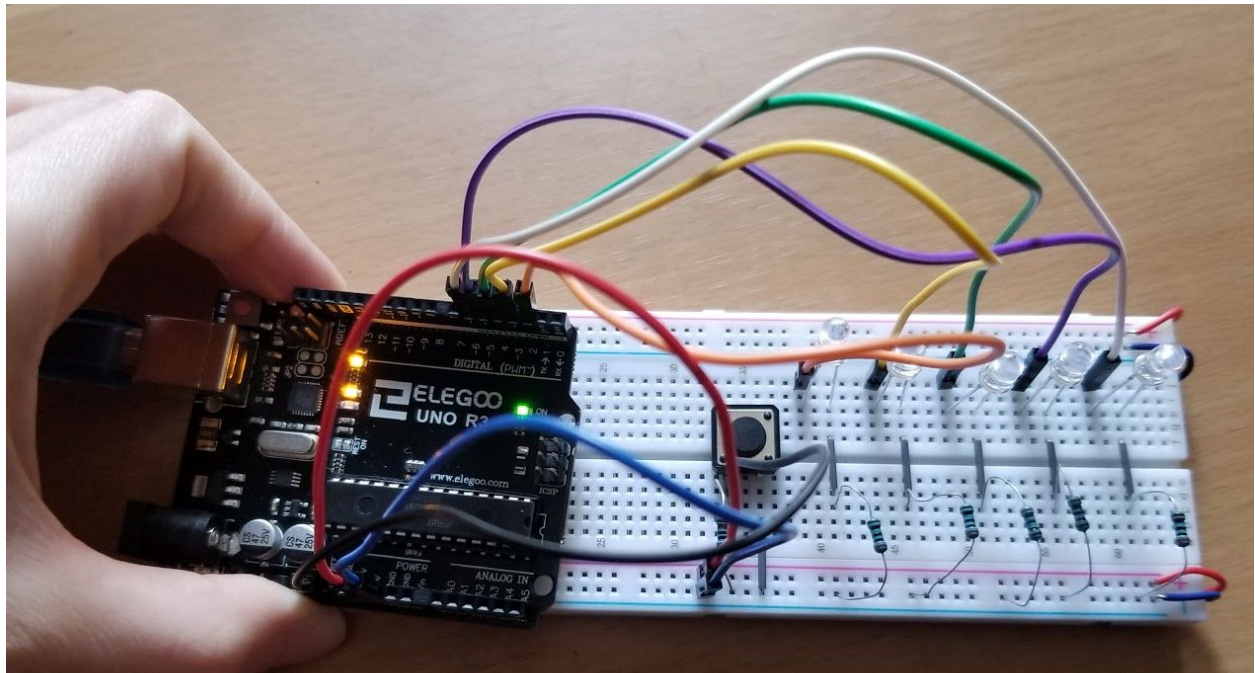


**Etude 2: Perceptron-P**  
**Mattie K. Alrod - 40066322**

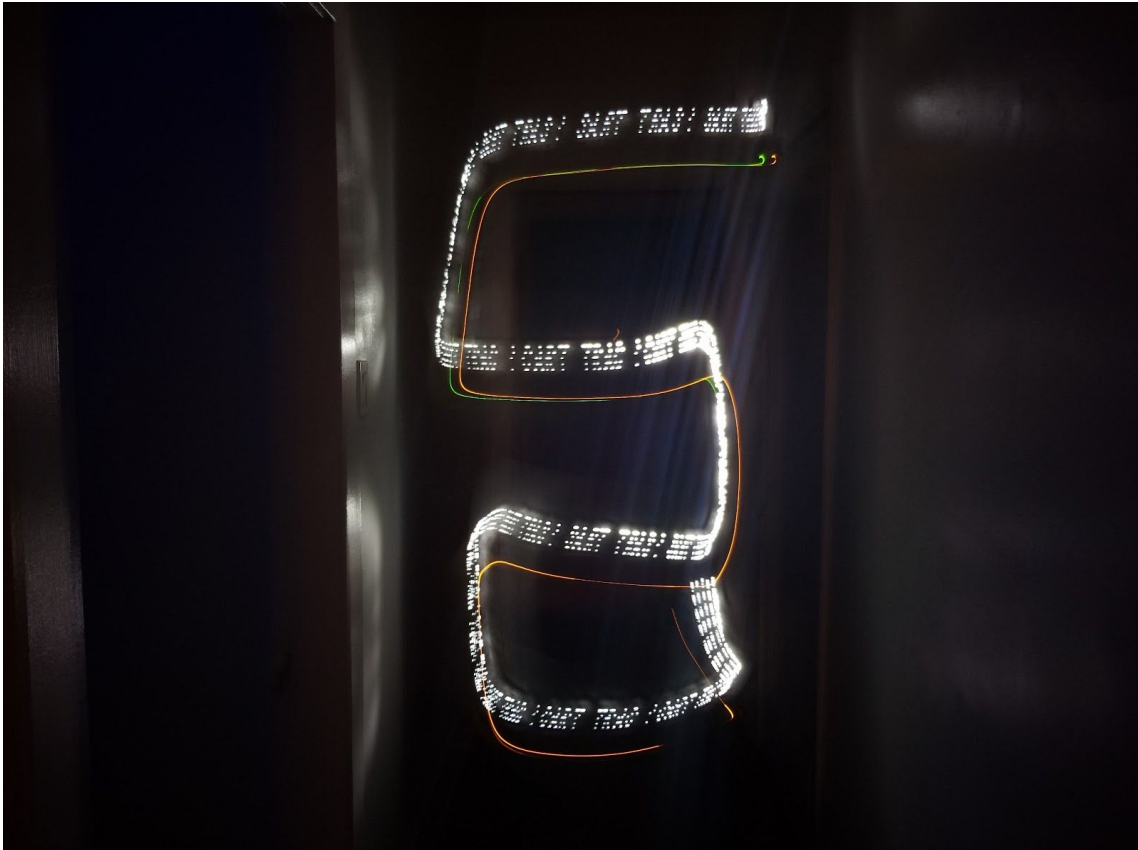
**Part 1: Perceptron-P Circuit**



Above is my completed *Version A* circuit. I thought having the tiny wires closing the gap between the two halves of the breadboard was a little redundant and could have been omitted in favor of just putting one end of the resistors right below each LED. That being said, I am not especially confident in my circuit-building abilities so I just stuck to the diagram.

I built *Version B* as well to see if I could notice any visual differences in the LEDs from one circuit to the other.

Then I tried out the default code and took a picture with the help of my roommate.



## **Part 2: Alternate Circuit**

### **What distinguishes the two circuits?**

The first circuit has one resistor for each LED, while the second one only has a single resistor. The five resistors in the first circuit and the single resistor in the second one have the same colour band markings, so it can be assumed that they are resistors of the same value.

### **What makes them different and why? Which of the circuits presented would be the more reliable circuit and why? What is occurring with the $V/I/R$ in the area that you have discerned as important?**

I have a lot of trouble visualizing current flow so I redrew the circuits in simplified forms on paper. The only difference between the circuits seems to be the placement of the resistor(s).



At first I thought that *Version A* was in series and *Version B* was in parallel, but it turns out that I deeply misunderstood what makes a circuit parallel. If I now understand correctly, they're both in series. Truthfully, I am not entirely sure what is going on in terms of  $V/I/R$ , so I am not confident that this answer is correct. I don't think that there's actually much of a difference between the two circuits. In *Version A*, each LED has its own resistor placed right before it in the circuit. In *Version B*, there is only one resistor, but the current travels through that resistor before splitting off toward the LEDs, so each LED would have that same resistance applied to them anyway. Assuming that this is correct, I imagine that *Version B* is more practical. Fewer components means fewer opportunities for something to go wrong or be knocked out of place on the breadboard.



### Part 3: Perceptron-P

Explain, the purpose of the highlighted area contained within the red rectangle a) what does it do? and b) why/how is the functionality implemented (electrically)?

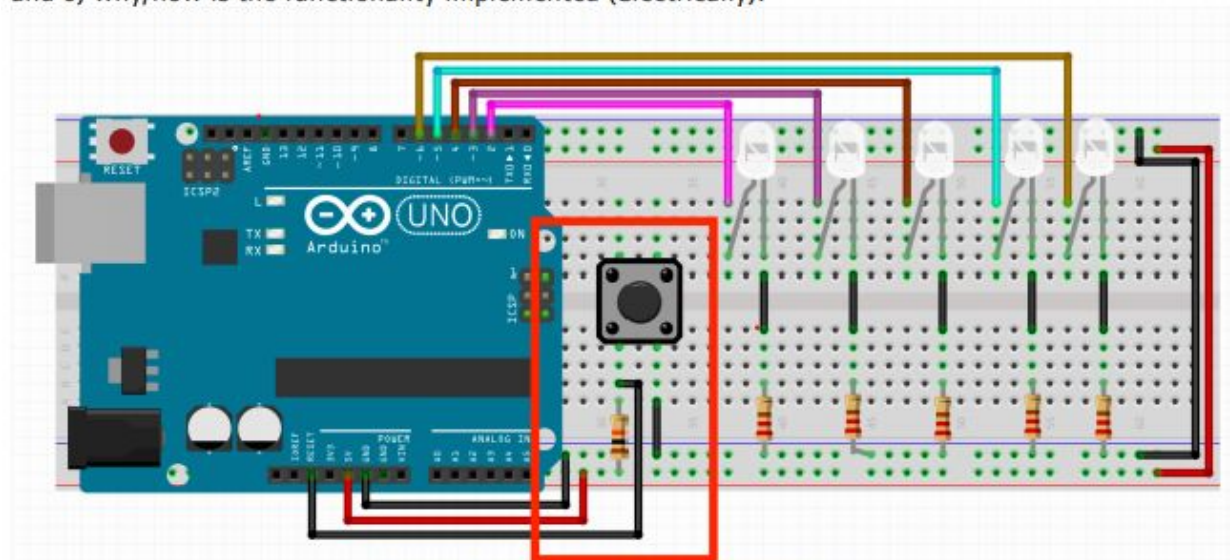


Figure 3: Explain the Function of Highlighted Area

The button component is connected to ground via one of the black wires, but is also connected to the reset pin through another. Pressing the button component makes the arduino stop, and then restart the code. From what I understand, the reset pin and the reset button do the same thing.

### Part 4: Create a Unique Perceptron-P Message

(See Video)