

Etude 2

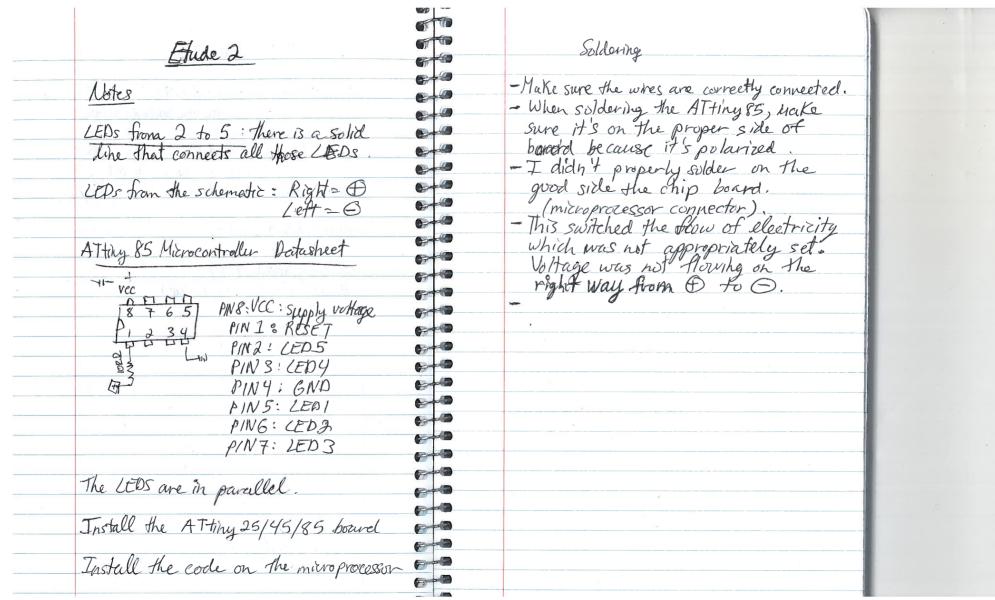
Analysis

Summary of my notes

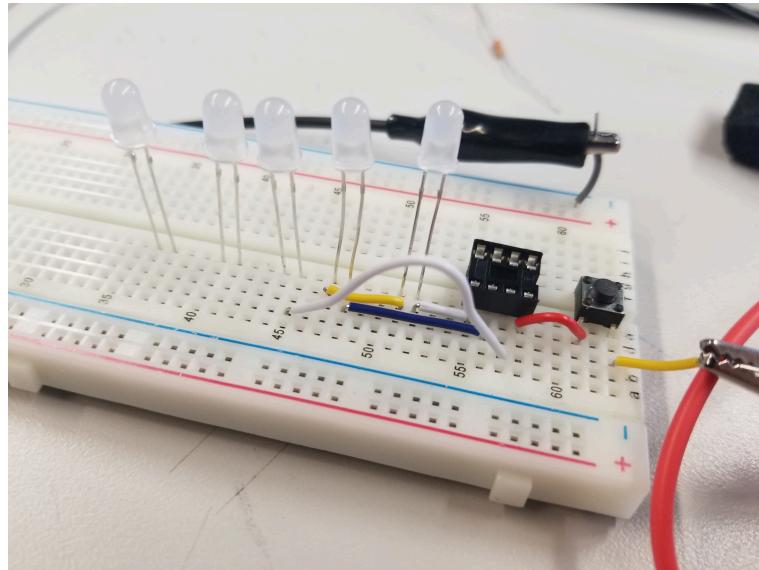
From the start, I treated the starting circuit that was built on the breadboard as a prototype. I find that the breadboard allows the person to experiment various types of circuit that might be the best one for a project. Plugging each LED in a specific way, making sure the ATtiny85 is properly set, and regulating the current in the right way with the wires allowed me to grasp the concepts of electronics. Continuously keeping in mind the polarity, the current, the voltage, and the resistance it made me explore the possible reactions within a current such as heat and polarity in components, datasheets of chips, and many more details that can be found in the description of the components.

The first circuit on the breadboard shows that it is made for experimenting and changing everything until I could find the best solution to build the final circuit of this type of project. While the soldered circuit became a final version of my Etude.

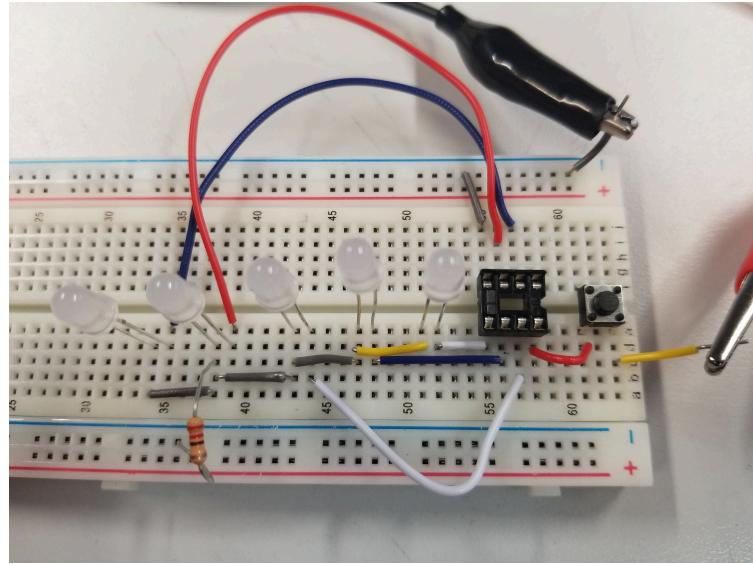
Working with a breadboard, I needed to use many wires to connect things, but in the soldered circuit, I could assemble various type of wires together if they were supposed to be soldered together. It allowed me to fasten the process of connection between components. Although the Perf Board is tiny, I had to work in a small scale which made me focus more on my precision. Sometimes I soldered wires, pins or components together where they were not supposed to. In this case, I had to use the desoldering pump to fix the issues which sometimes took a lot of time to fix and continue my progress of building my circuit. On the other hand, If you make a mistake on a breadboard you can easily change any components or wires. I made a mistake and soldered everything in a reversed way where the positive voltage was going into the reset pin on the microprocessor. From that point I realized that my microprocessor is not correctly connected to all the pins in relation to the LEDs. I had to restart all the soldering. This is exactly why a circuit on a breadboard is useful for experimenting before going to soldering since you could do mistakes that might get you in trouble.



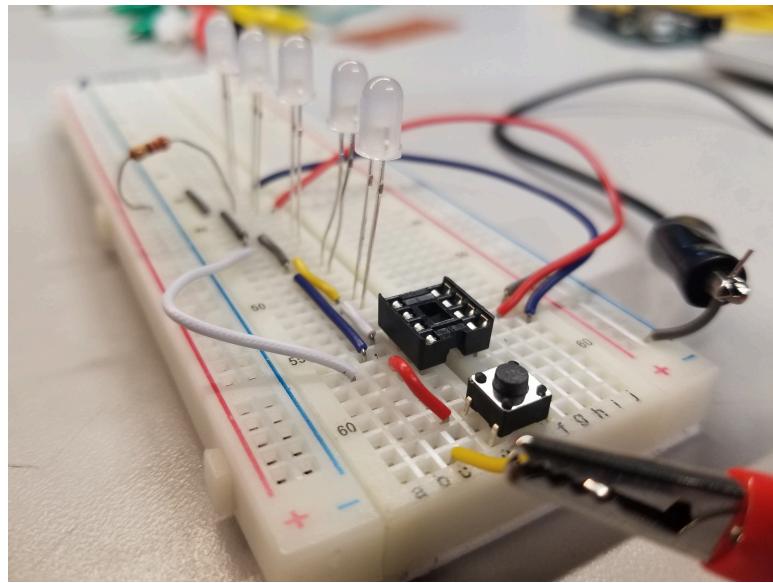
DOCUMENTATION



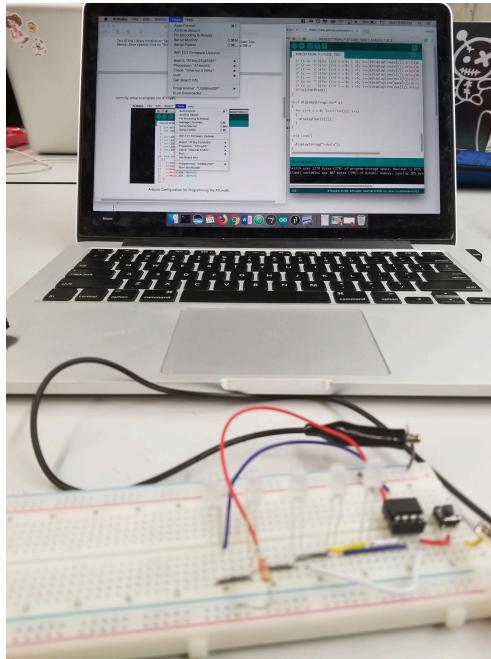
Slowly building the circuit. Looking for voltage flow, polarity, and components placement.



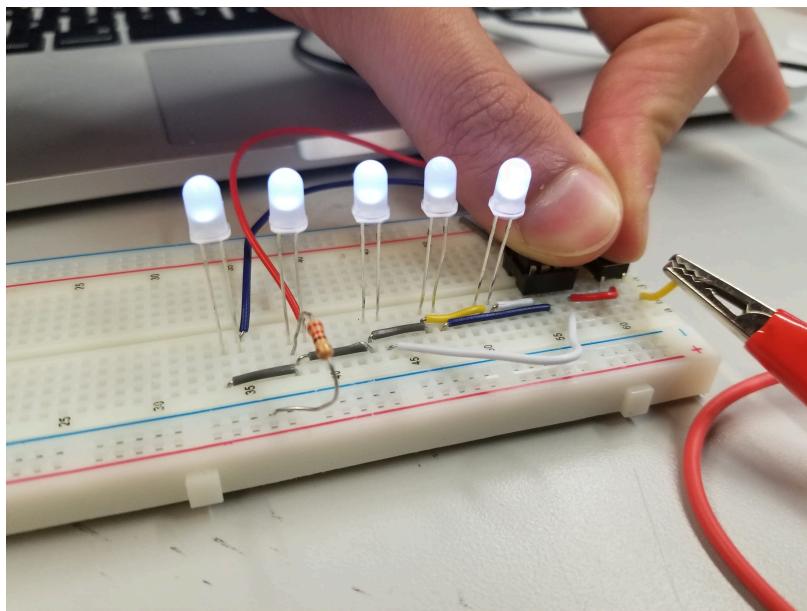
Acknowledging the parallel circuit that I am building because we can see that each negative wire of the LEDs is connected together.



A closer look at the circuit with all the components properly sets inside the breadboard.



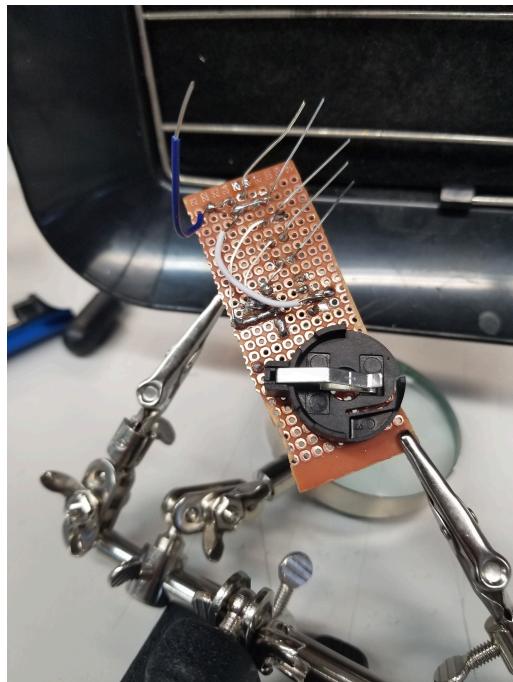
Setting the Arduino to upload the microprocessor ATtiny85 chip.



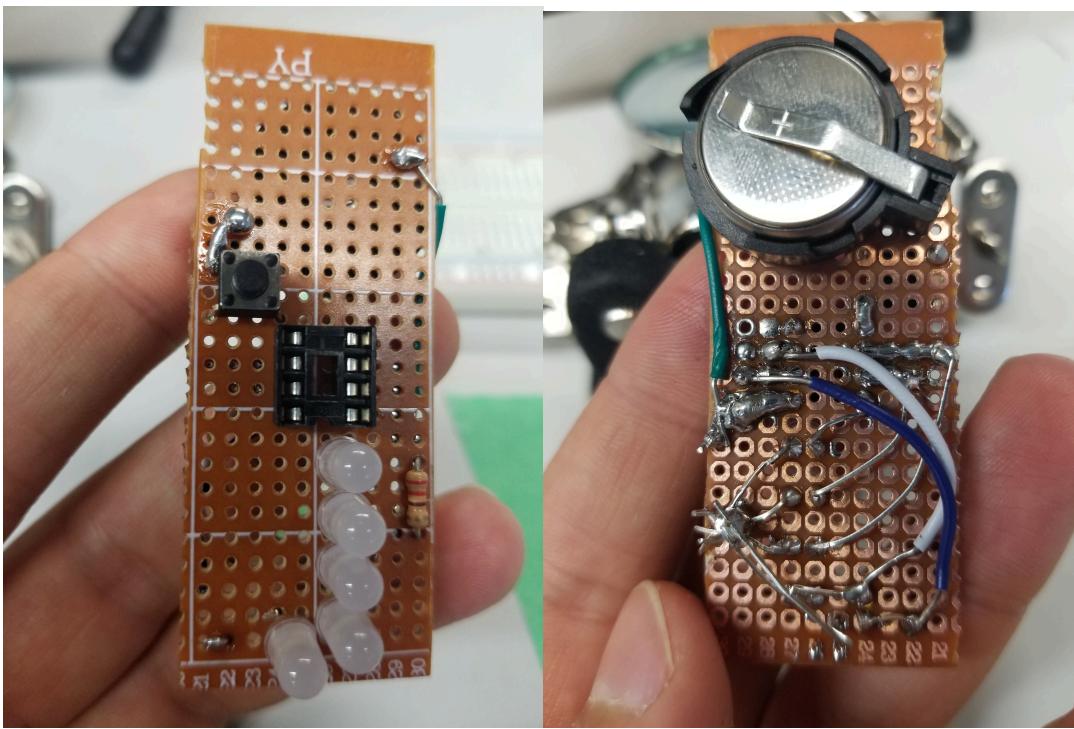
Testing the circuit by pressing on the button (switch) which allows the flow of the current.



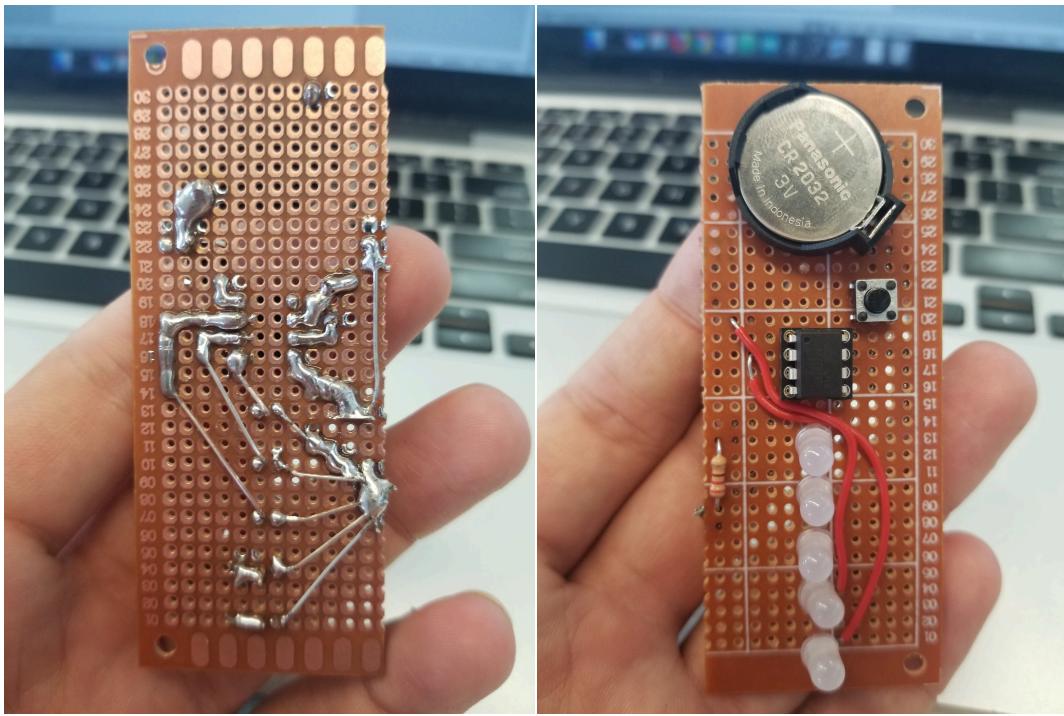
Starting to soldering the components on a board.



The process of soldering the components and wires together



I realized I soldered everything the wrong way by inverting my PINS, VCC, GND, and RESET of the microprocessor. As we can notice the positive current is on the right side of the board.



The new soldered circuit is still not working. I think there is possibility that some soldered wires are touching at PINS 5, 6 and 7. The melted wires are close to each other where they might disrupt the flow of the current.

Built Circuit vs Alternative Circuit

The main difference between the two circuits is the resistance between the LEDs and ground. We can see that, in the build circuit, we have one resistor which controls all the current of the possible LEDs because the LEDs are in parallel and have the same resistance flowing to ground. In the alternative circuit, there is a resistor after each LED which changes the voltage in each LED because it all depends on the resistor value after each LED. If the resistance is lower, some LEDs might be brighter or, if their resistance is higher, it could be dimmer. It basically allows the person to control each LED with a different brightness, but it won't be suitable because, once it has been soldered, the resistance cannot be changed..

Since there are more resistors in the alternative current, the circuit is providing more branches where the current can flow in parallel through the LEDs. We can notice that the current at the LEDs is lower since the resistance is higher throughout this portion of the alternative circuit, and each LED has a different brightness because the current is not the same throughout each LED. This could allow us to change the brightness of each LED at any given moment.

To potentially make this circuit useful, we could add a potentiometer after each LED where we could control the resistance of the LEDs which affects their brightness. It allows us to control manually the components, and become more of an interactive device. In this way, this experience allows the user to have a further control that make words partially disappear or appear depending on the brightness of the LEDs.

This experience could turn into a trickery where the user shows the word in the dark which different parts are changing overtime and creating new letters. By changing the light in dark, the LEDs could create new forms or shapes that the people could not fully grasp at an instant moment. It would become some sort of improvised experience between lights and public such that we could go beyond a word, and see more engaging shapes between something we could reference to a conceptual aspect and abstraction that lets our imagination expand further than conceptual thoughts.

New Schematic for Circuit

