
ETUDE 2: PERCEPTRON-P

Professor: Elio Bidinost & Sabine Rosenberg

Course: CART 360

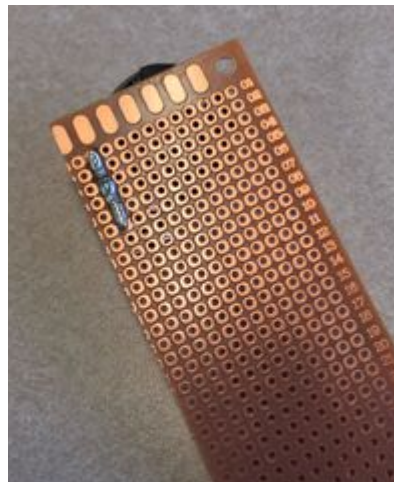
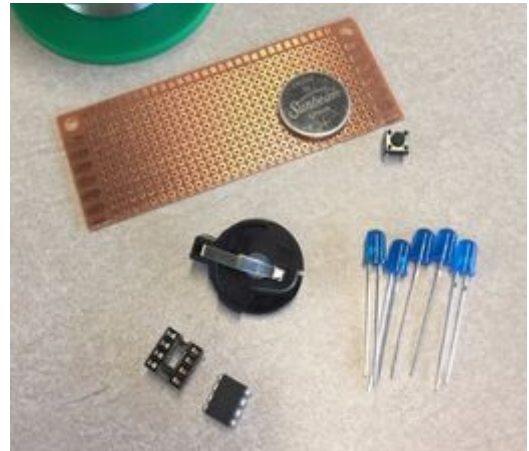
Student: Liu WenYue (40098425)

Date: September 25, 2019

Github repository URL: <https://github.com/Liu-WenYue/cart360-2019>

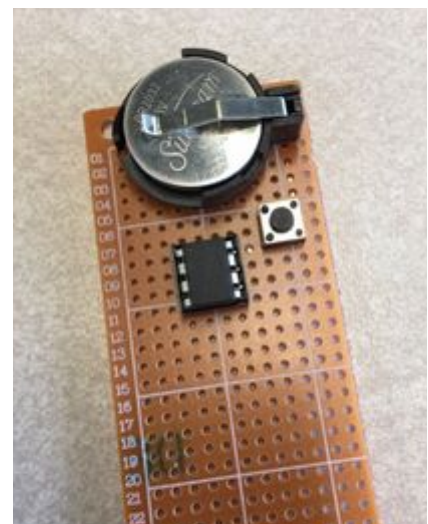
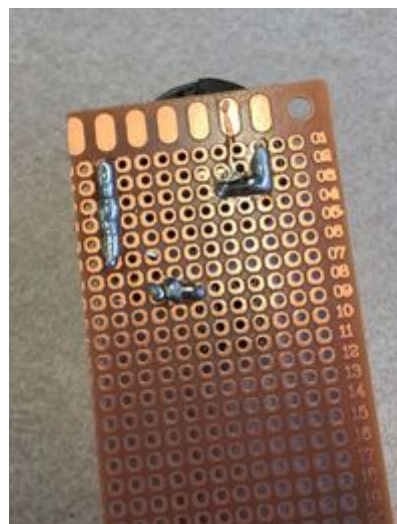
Part a

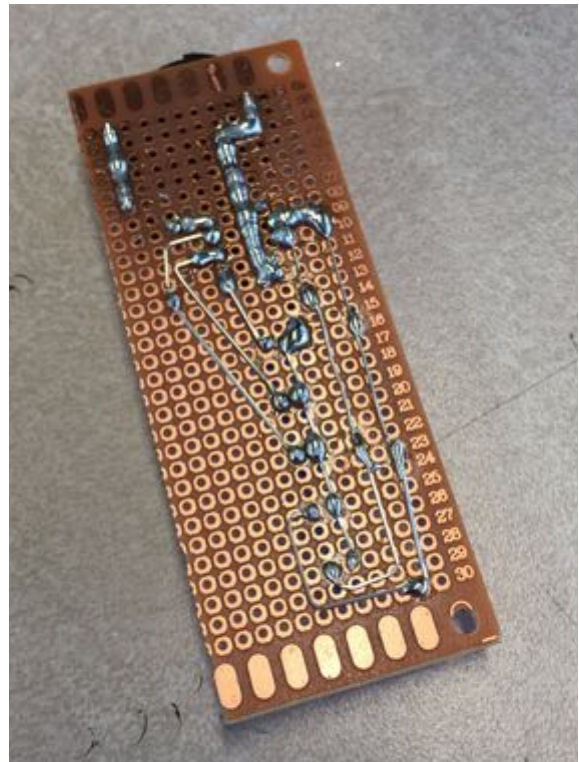
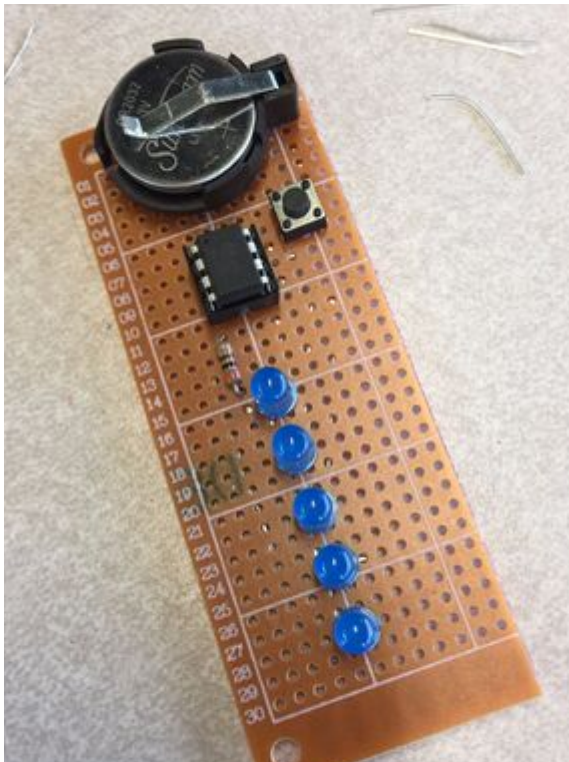
I started the exercise by preparing all the components needed. And then I first connected the ATtiny 85 Microcontroller and its connector, and inserted the coin cell onto the battery clip.



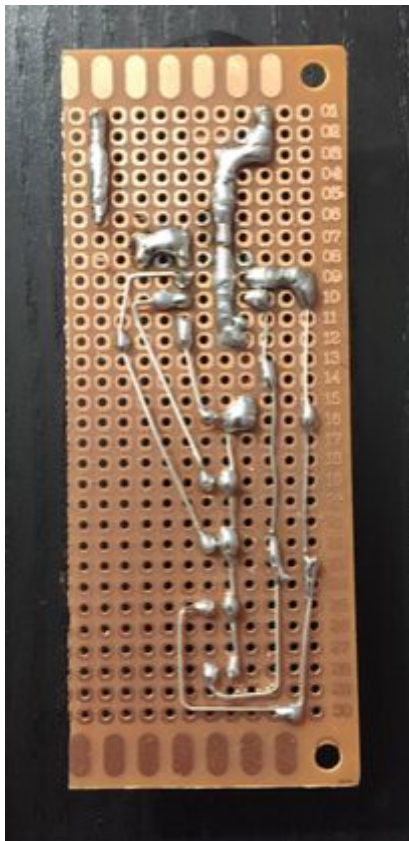
The way I approach this exercise will be building the circuit and soldering it at the same time. I started from the top of the circuit board - the battery and the switch.

Next, I added the ATtiny85 controller onto the circuit board.





Lastly, I mounted the resistor and five blue LEDs vertically on the circuit board. At the back of the circuit, I soldered the resistor, LEDs and microcontroller together.



Some of the soldering was not perfectly done, so the circuit was not working. The image on the left is the cleaned up circuit.

Part b

The main difference between the Built Circuit and the Alternate Circuit is the number of resistors used and the way these resistors are placed in the circuits. In the Built Circuit, there is only one resistor used to control all the Blue LEDs, and the resistor is connected in series with the five LEDs which are in parallel with each other. On the other hand, there are five resistors used in the Alternate Circuit. Each resistor is in parallel with a single LED and the groups of resistors and LEDs are connected in series. The voltage on the LEDs is the same for both the Built Circuit and the Alternate Circuit. However, the current on each LED in the Built Circuit is $\frac{1}{5}$ of the circuit's current (because the LEDs are in parallel) whereas the current of a resistor and an LED is $\frac{1}{5}$ of the circuit's current (because the resistor and LED are in series).

I believe the Alternate Circuit is more reliable than the Built Circuit. The resistors are used to control the current flowing to the LED, if the resistor is not working properly, the LED will not be working as well. Therefore, in the Alternate circuit, five resistors are controlling different LEDs. In other words, if one of the resistors is broken, the other four LED will still work. However, in the Built Circuit, if the resistor is broken, all the LED will not be functioning.

To make the circuit more meaningful, I would introduce the Grove - Temperature Sensor into the circuit. With the temperature sensor, the LEDs flicker when the environment temperature is higher than a fixed value.

