Etude 2

PART 1

For this etude I started by attempting to set it up on a breadboard, initially it didn't work and I didn't completely understand why. Initially I thought it was because I hadn't properly uploaded the code for the attiny85 as I had a gotten memory error (which turned out to be that I hadn't configured to the correct attiny that has a smaller RAM than the one I am meant to use. It turns out that it had more to do with a battery that wasn't performing very well as only one of the lightbulb would light up until I switched a brand new battery that lit up the 5 LED's and confirmed that my circuit was set up correctly.

Following this - I switched the orientation of the LEDS, and the circuitry accordingly - as I had initially followed the graphical diagram as opposed to the schematic: which is neither practical to solder nor is it as visually comprehensible.

At first I didn't quite understand how the two were equivalent, but after trial and error, the translation of the schematic on to the circuit board made a lot more sense regarding the relationship between the various components and their polarities

The soldering process was relatively straightforward, however certain parts of my board didn't seem to allow soldering parts to connect together, and would create separate blobs whilst also melting the top coating of the boarding on solder side. It also appeared that that melted coating/ substance mixed with the soldering in those particular areas seen fig 4.. This is because of the resin on the board. To avoid this, to a certain extent, I created a different soldering pathway to the positive side of the ground of the battery making is slightly easier to connect.

Unfortunately despite the soldering and wiring being placed correctly, 3 of my 5 LED's were placed the wrong way in terms of the polarity (LED's pin 2, 3 and 5). And due to time constraints and it being quite challenging technically to switch them (this would implicate a very precise
It was impossible to see visually, and unfortunately forgot to test with the power supply until after I had soldered (and figured out why only two the LED's were lighting up correctly). I suspected that I placed them the wrong way around the day before, but proceeded to ignore this essential step that would have allowed the circuit to work successfully.

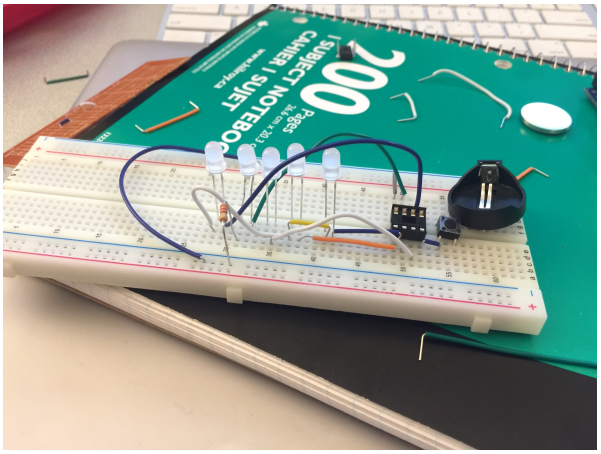


Fig 1.

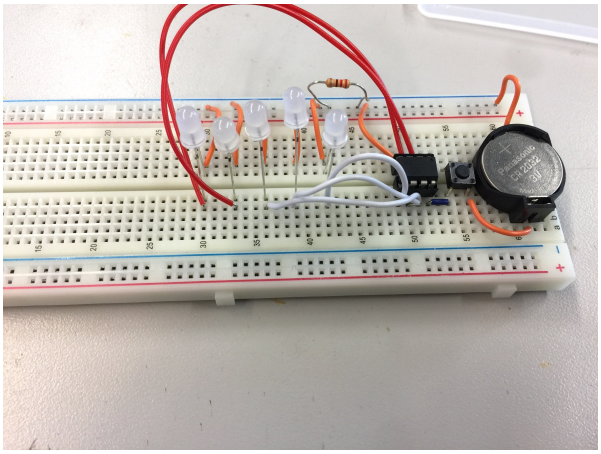


Fig 2.

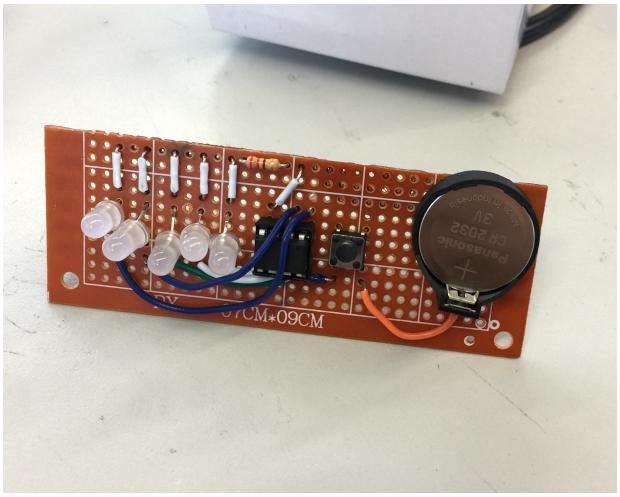


Fig 3.

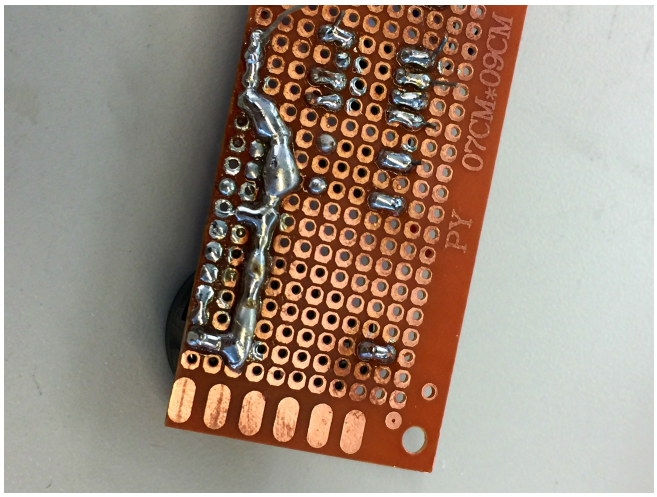
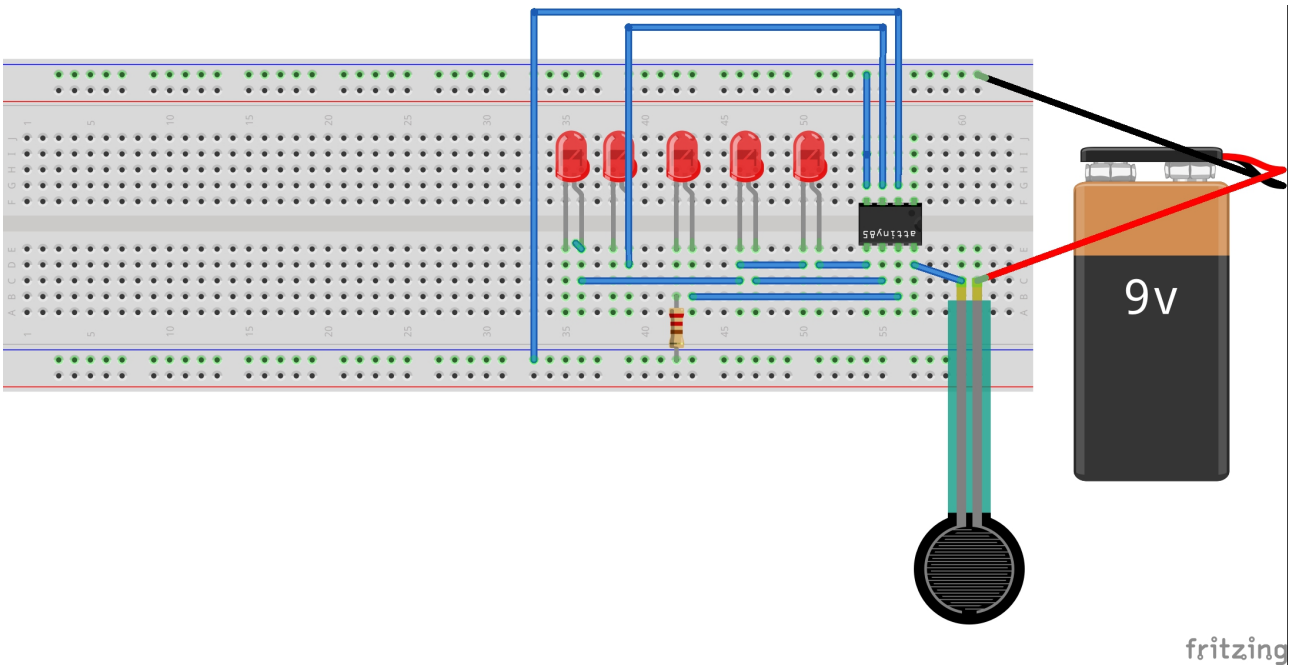


Fig 4.

Because only two of the LED's are functional the message "aaah!" isn't distinguishable but it still remains interesting to look at what kind of shapes the two create.

PART 2

The key difference between the built and altered circuit is the number of resistors. Instead of connecting one resistor (third LED) to the ground (negative), the alternate circuit uses 5 resistors connecting the ground to the five different LED's. Because the circuit in question if in parallel, unlike in series, an increased number of resistors will increase the electrical current flowing through the circuit and therefore reduce the overall resistance. This also would mean that the voltage decreases for each resistor as well. Consequently the non-altered circuit will be the more reliable of the two.



MEANINGFUL EXPERIENCE

In order to make it a more meaningful experience I would replace the current switch with a force sensitive resistor so that (ideally) the LED's intensity would be altered according to the pressure applied to the sensor. I believe that of having user driven data that affects the components, and in this particular situation the LED's makes the experience a lot more engaging than a momentary switch. This is due to the direct variation. However the FSR is reportedly not extremely reliable and therefore I suspect that the user data's input wouldn't be so obvious.

An extension of this particular situation would be to use pulse sensor instead of the FSR or momentary switch. ideally it would be a small device that depending on the user's heart rate it would represent the level of "calmness" on the LED's. For instance for someone's heart rate roughly between 60 and 100 bpm the LED's would be very bright and therefore the words would be clearer. On the other hand if someone's hear rate was above that, the LED's would dim and make the words more difficult to understand.