11/2,4/20

Background and Objective:

The objective of this week's testing is to get more than 2 motors spinning at a time from our motor driver board, using an I/O expander. Also, if possible, to be able to individually control these motors with specific characteristics.

Also, to begin with, 2 motors were not working last week (only one was spinning), so first we must get 2 motors to spin.

The reason why we want more than 2 motors spinning is that we will likely have 6 wheels for our rover, and 2 motors doesn't seem to suffice for this. For now, I believe that 4 motors (1 for each axle, 1 for turning) will be good for our uses.

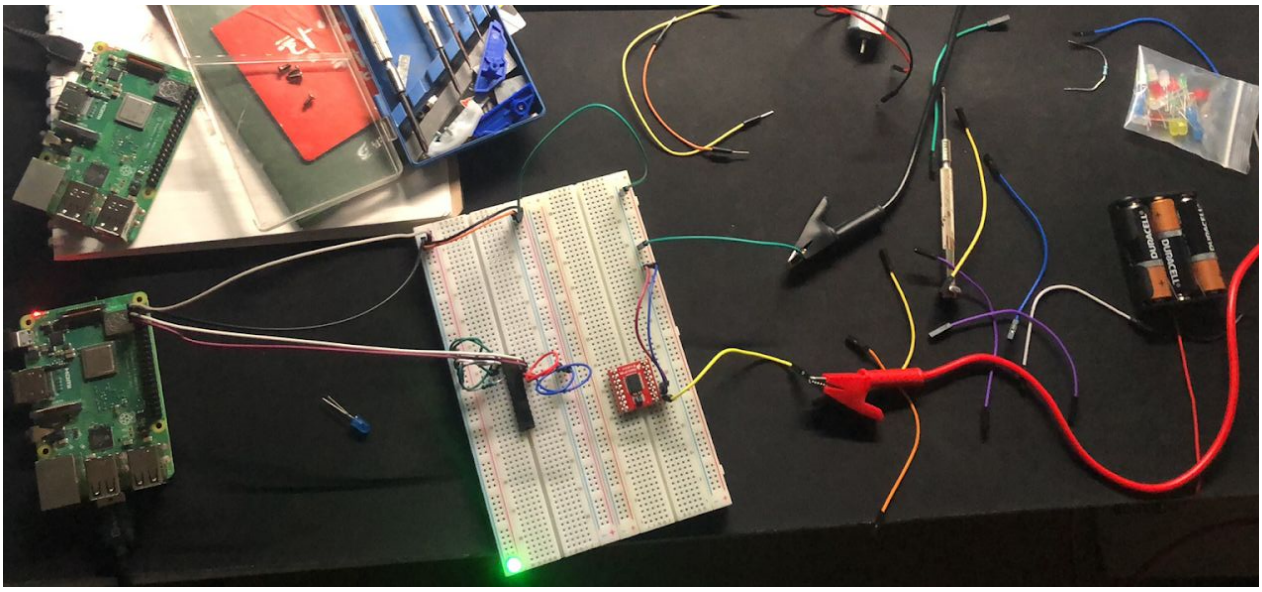
Requirements:

Requirement	Description
Get 2 motors to spin	2 motors connected to the driver board system should spin (not just 1). (success)
Get 4 motors to spin	Using a GPIO extender, get 4 motors to spin. (failure)
Individual motor control	Write (find online) code that will send separate information to all 4 motors (did not attempt)

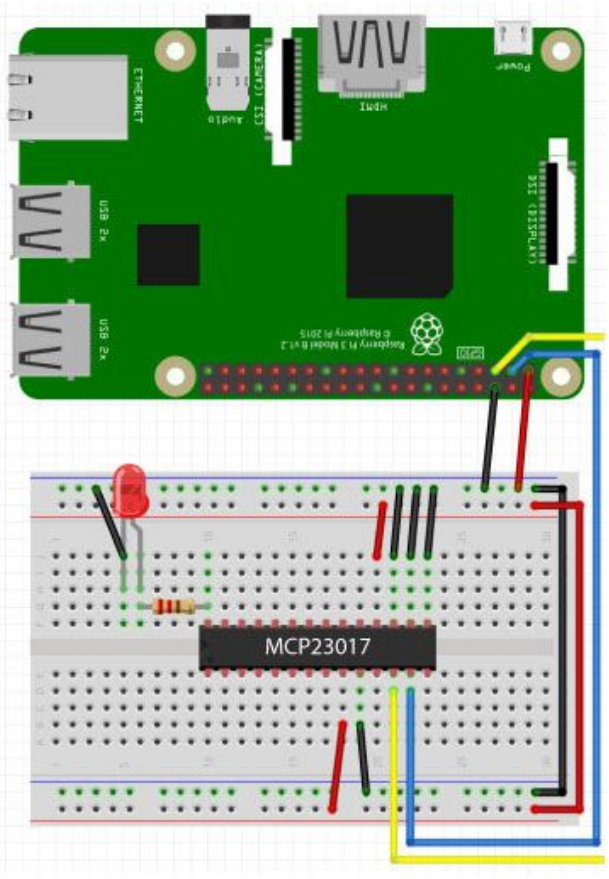
Issues and Solutions While Testing:

1. (11/2/20) Only 1 motor spinning--swapped out the motor for a different one. It appeared the first motor was dead. Upon swapping the motor, it instantly worked.
2. (11/4/20) Raspberry Pi could not read SD Card (and therefore I could not run any Python code). Google says that no green light means the SD card is not being read. After reflashing the Raspbian OS, I still couldn't get any card read onto the Pi.--I borrowed a Pi from one of my dad's coworkers and got card read from that Pi.
3. (11/4/20) Could not use just a GPIO Extender (MCP23017) to get 4 motors to spin--I initially thought that I could simply use a GPIO extender with a Pi to get the proper pins to a single motor driver (TB6612FNG), but that wasn't the case. I did not get very far before realizing that I also needed another motor driver to get the proper outputs to get 4 motors spinning.

System Picture:



Failed Circuit Setup Attempt to Get 4 Motors Spinning Using 1 GPIO Extender and 1 Motor Driver.



MCP23017	RASPBERRY PI
pin 18 (Reset)	→ pin 1 (3.3v)
pin 17 (A2)	→ pin 6 (GND)
pin 16 (A1)	→ pin 6 (GND)
pin 15 (A0)	→ pin 6 (GND)
pin 13 (SDA)	→ pin 3 (SDA)
pin 12 (SCL)	→ pin 5 (SCL)
pin 10 (Vss)	→ pin 6 (GND)
pin 9 (Vdd)	→ pin 1 (3.3v)

Questions

Is there a better way to get spin to 4 motors? For now my solution is getting one more motor driver from James, but I am not sure if this is the best way about doing this.

What's Next

I will be getting one more motor driver from James on 11/6 night, and get 4 motors spinning on 11/7. Over the weekend. I hope to touch base with Tobe and get some Python code going that will get the motor spin characteristics that we want.