Kevin Sass

Corey Zheng

4/19/18

CSC 299

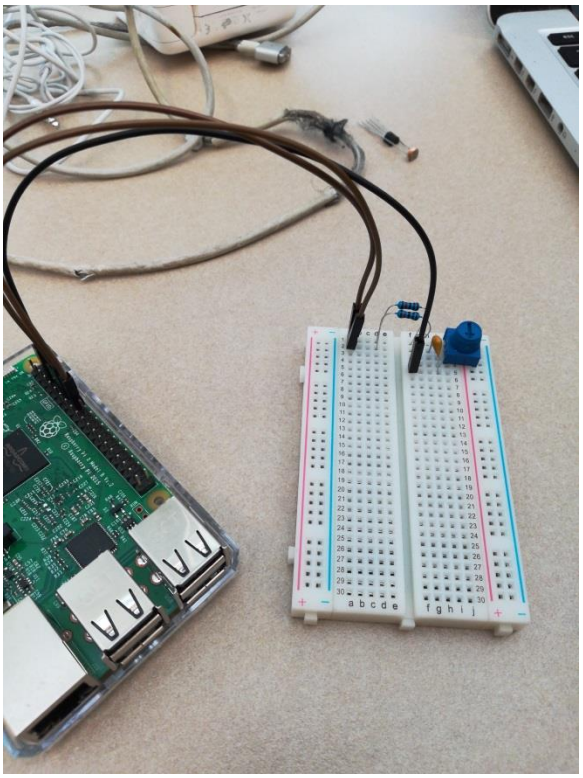
Lab 4

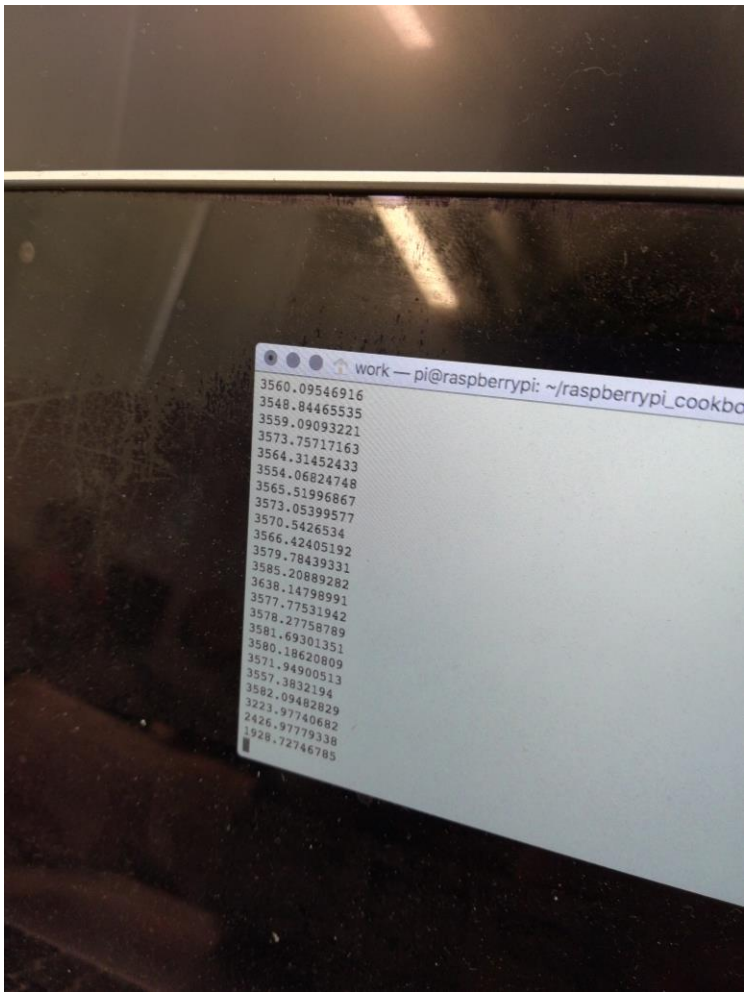
In this lab, first we learned how to measure resistance on a Raspberry Pi using nothing more than a capacitor, a couple of resistors, and two GPIO pins. In this case, we were able to estimate the position of the knob on a small variable resistor (trimpot) by measuring its resistance from its slider contact to one end of the pot. We also learned how to measure light intensity with a Raspberry Pi and a photoresistor, by replacing the trimpot with a photoresistor. The photoresistor's resistance depends on the amount of ambient light. More ambient light decreases the resistance and less ambient light increases the resistance. Next, we learned how to measure an analog voltage, using a separate analog-to-digital converter chip, since the Pi GPIO connector has only digital inputs, and interfacing to the chip using the Raspberry Pi SPI interface. Next, we learned how to use a potential divider with one fixed resistor and the resistive sensor to convert the resistance of the sensor into a voltage that can be measured with the ADC with the light sensor project. Finally, we learned how to measure temperature using a TMP36 and an analog-to-digital converter.

When we did recipe 13.5, we could only get adc_test.py to display two different values and nothing in between those two values. We double checked our circuits to ensure that we had everything connected properly. Later, we added a line of code to adc_test.py to slow down the SPI speed. This made 13.7(light sensor) a success for us. We could not get recipe 13.8 to work.

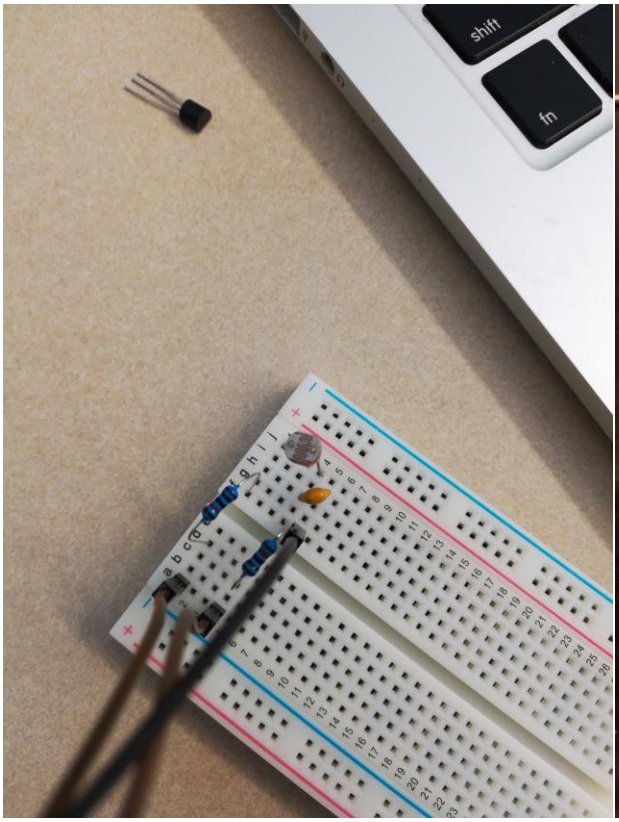
Again, this only displayed two values. We tried to slow down the SPI speed for adc_temp36.py to no avail.

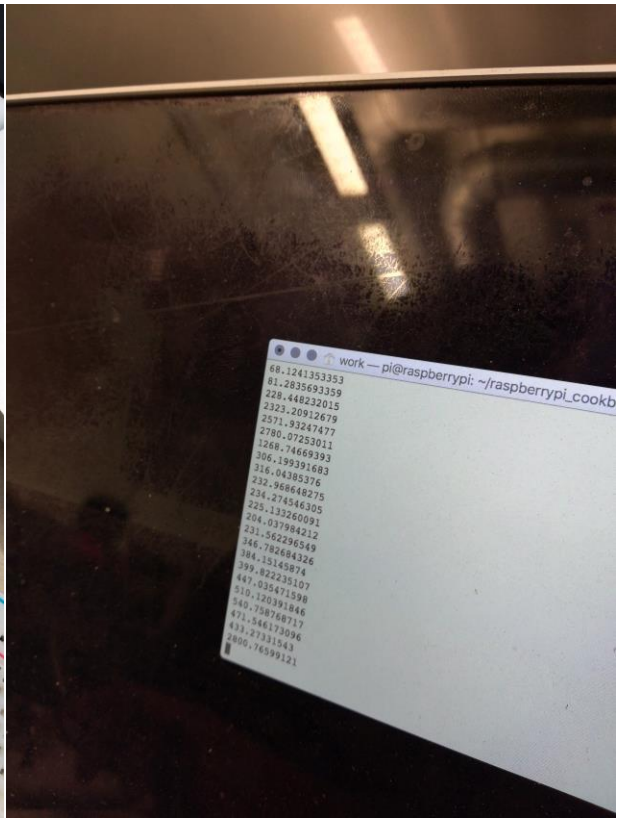
#4 Using Resistive Sensors:



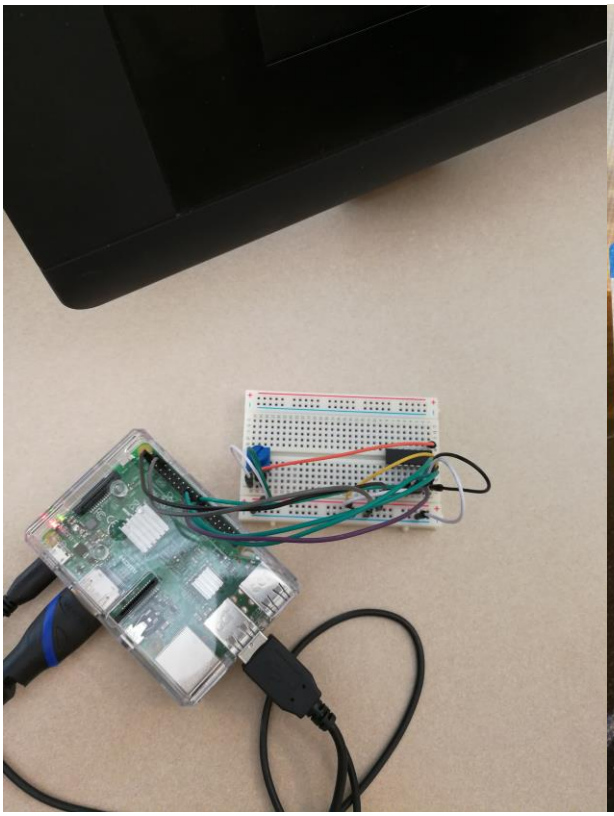


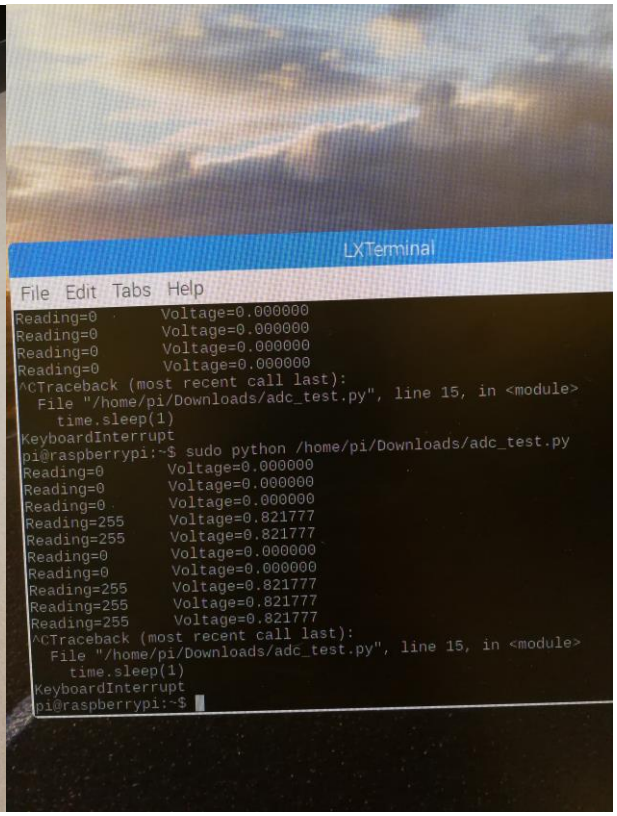
#5 Measuring Light Intensity:



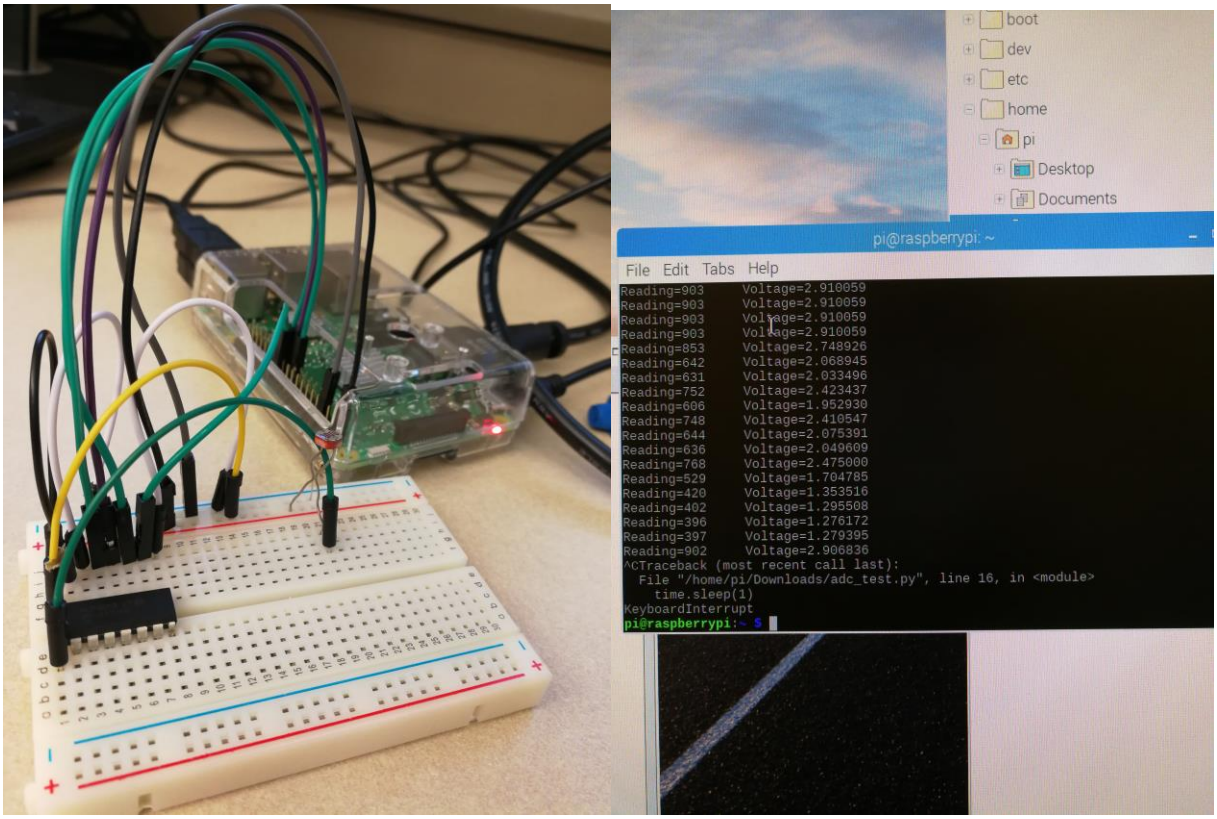


#6 Measuring Voltage:





#7 Using Resistive Sensors with an ADC



#8 Measuring temperature with an ADC