E11 - Week 8 Lab

Basic Circuit

6. V = IR -> I = V/R (5V)/(1ohm) = 5 amps
   a. No, the 2 amp current is not sufficient.
   b. It would probably fry the Rpi in an attempt to run the 5 amps through the resistor

7. We are using 470 ohm resistor instead (A 50 ohm should theoretically be enough as it would pull only 0.1 amps)
   a. Expected/theoretical value is 1.0638 mA (5V by 470 ohm) . We measured 11 ohm which was extremely odd.

LED in a circuit:

1.
   a.
      i. The longer leg of the LED is the anode and should be facing the +5V side
   b. The voltage drop across our 470 ohm resistor was 2.49V
   c. The voltage drop across our green LED was 2.67V

2.
   a. It seems like the LED should get brighter and it did, by a lot.

3. As expected higher resistance values correlate inversely to the LED brightness
   a. The voltage drops do change, with larger resistors creating larger voltage drops, still hovering around ~2.5V +/- 0.2V

4.
   a. As expected, the brightness drops with the 3.3V input

5. b. The LED brightness will (and did) go up with the increase in voltage

6. It was a large change (my eyes hurt)

7. The voltage drops do change with the brightness, with red seemingly drawing the least current and green drawing the most (of the ones we tested).

Photo-diode:

2. With the 470 ohm resistor we saw 8mV across it.
3. When we cover it we see the voltage drop to 0.6mV across. With the 3.3V we see the resistor have a voltage of 4mV across it.
   a. Using the dark voltage drop of 0.6mV and the resistance, we can find the dark current to be 1.3 μA.
   b. In either case of 5V or 3.3V, it is possible to see a signal, though it is somewhat weak
   c. With 10 and with 15 we got similar values and it remains somewhat weak.

4. At 7mV, 15 μA is the saturation current. And as stated above, at a voltage drop of 0.6V, the dark current is 1.3 μA.