IT 327 - Lab #1
Ohm's Law and Series Circuits

Objective

The objective of this lab is to give students a chance to observe the basic relationship described by Ohm's Law and the basic relationships of combining loads in series.

Equipment Required

For this lab, you will need a few assorted resistors, a DC power supply, and a DMM (Digital Multi-Meter). Resistors: 33 Ω, 100 Ω, 330 Ω, 1.0 kΩ, and 3.3 kΩ.

Assignment

Be sure to take plenty of pictures and include them in your write-up with an appropriate caption.

1. First measure the resistance of each of your resistors using the DMM. Determine how close it is to its rated value, and whether it is within its rated tolerance.

To observe the relationships described by Ohm's law, do the following:

2. Set the DC power supply to a voltage between +3V and +5V; be sure to record the voltage you chose.

3. Measure the current through the circuit with each resistor, in turn, connected (one at a time) to the power supply. Determine how close the actual (measured) current is to the current predicted by Ohm's law. Draw a graph of the actual results compared to the predicted results. Determine the percent difference for each measurement.

4. Decrease the voltage by 1 Volt and repeat the procedure above. Did the current go up or down? Were the results as you would have expected?

To observe the effects of combining resistors in series, do the following:

5. Set the DC power supply to +5V; connect a 330Ω resistor and measure the current.

6. Now add a 1.0kΩ resistor in series with the 330Ω resistor and measure the current. Did the current go up or down? Calculate the expected current for the series combination, and compare this value to the measured current. Were the results as expected?

7. Now add a 100Ω resistor in series with the other two. Measure the voltage drop across each resistor and compare to what you would expect using the voltage divider rule. Does the sum of the voltage drops equal the applied voltage? Would you expect it to?

Report and Conclusion

Tell what this lab has taught or reinforced. Include "small" things, like how to connect an electronic circuit, a DMM, draw a schematic, etc.