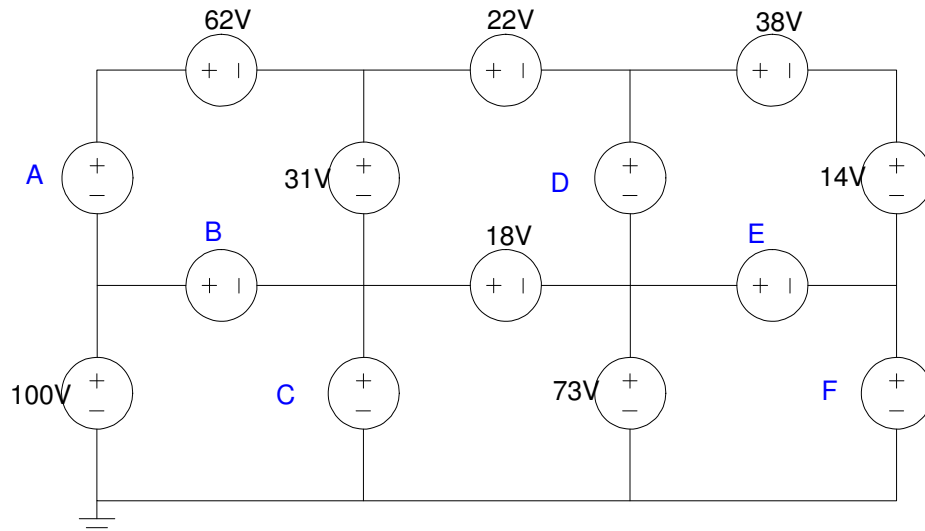


ECE 211: Homework #2

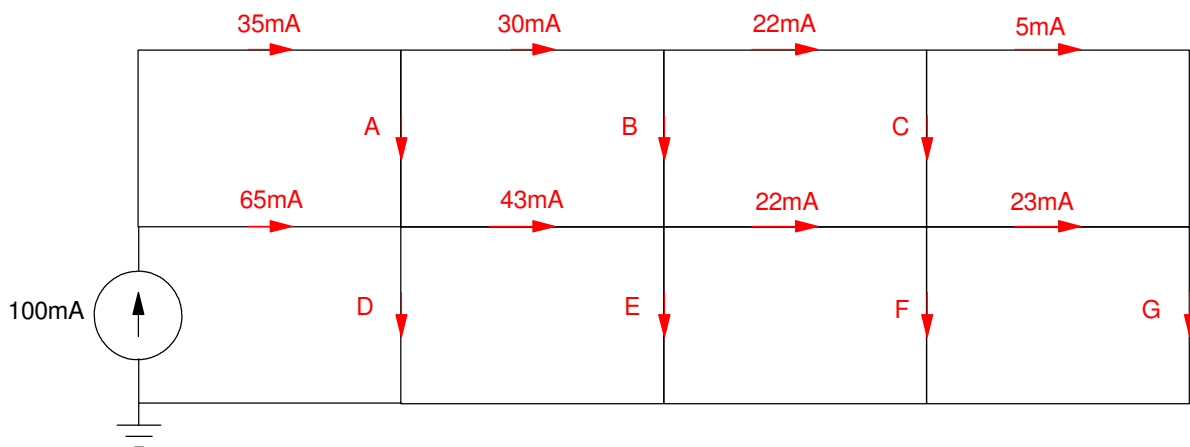
Kirchoff's Laws, Resistors in Series and Parallel, Voltage and Current Division

Kirchoff's Laws:

- 1) Use conservation of voltage to determine the unknown voltages



- 2) Use conservation of current to determine the unknown currents

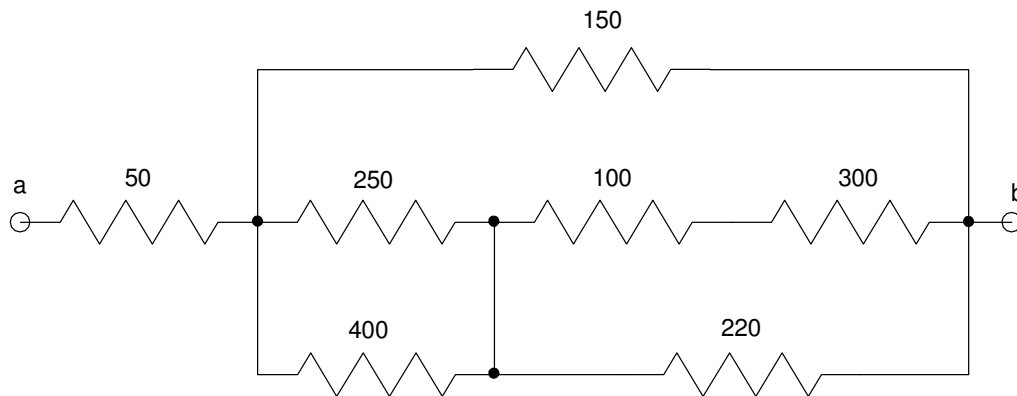


Resistors in Series and Parallel

3) Determine the resistance R_{ab} for the following circuit

4) Determine R_{ab} using CircuitLab

- Build the circuit using CircuitLab
- Apply +10V to (a) and ground (b)
- Run a DC simulation and find the current draw
- The net resistance is V / I



Problem 3 & 4

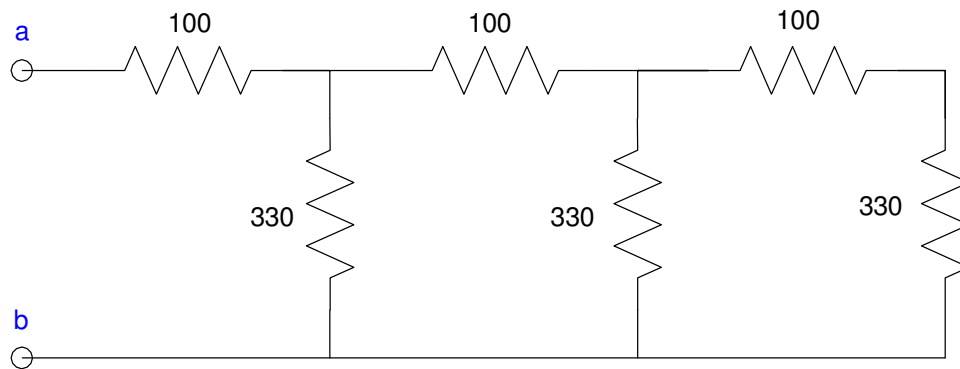
5) Determine the resistance R_{ab} for the following circuit

6) Determine R_{ab} using CircuitLab

Lab (part 1)

7) Build this circuit using your breadboard. Measure the resistance R_{ab} using your multimeter

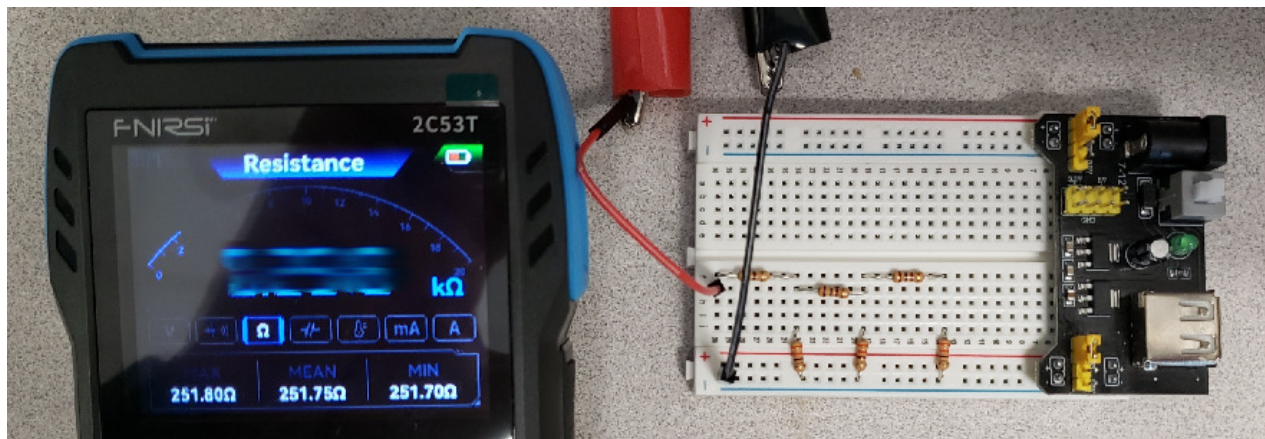
- Check that your answers for problems 5, 6, and 7 all match (or are close)
- Include a photo of your multimeter and circuit in your solution



Problem 5 - 7

note:

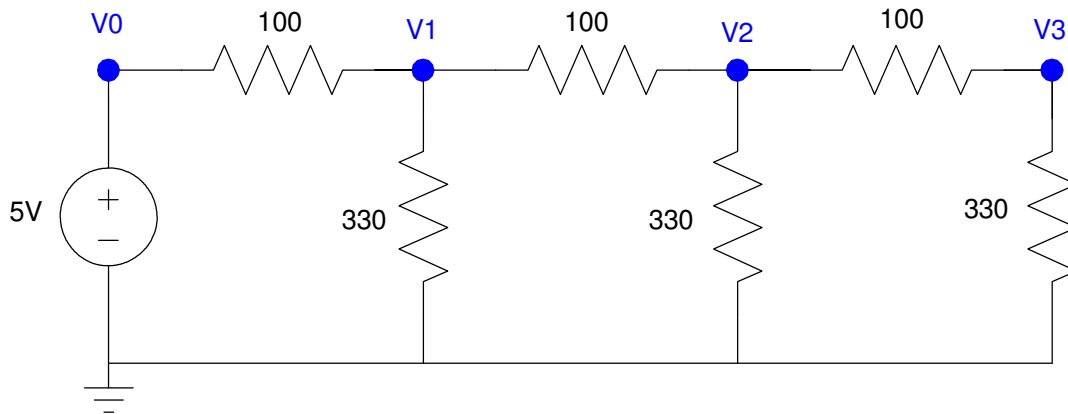
- Use your breadboard in your lab kit
- Use the blue rail (bottom and top) as ground
- Keep your circuit neat. It saves a lot of time debugging.



Sample of what your circuit might look like

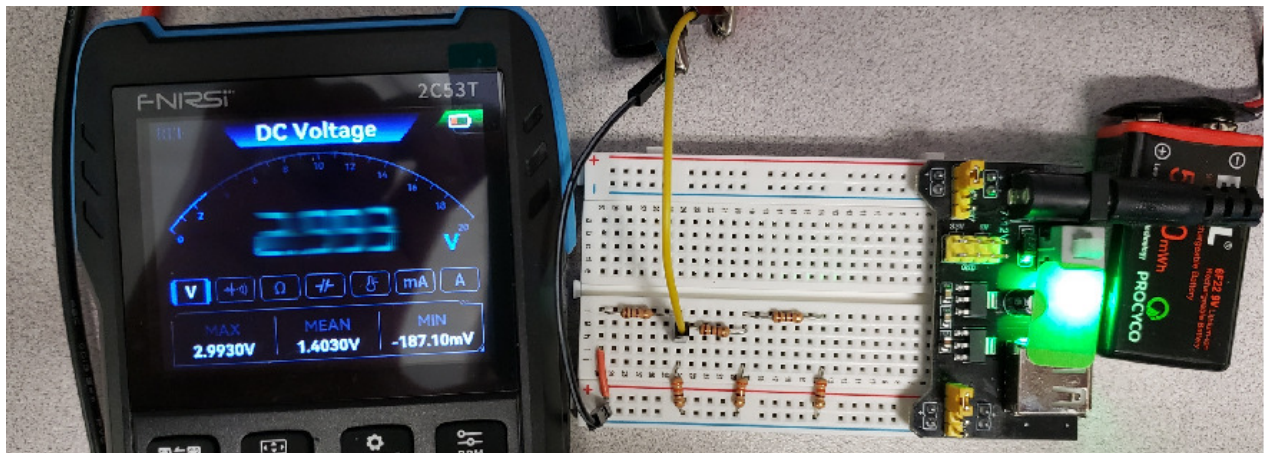
Voltage Division

- 8) Using voltage division, determine the voltages at {V0, V1, V2, V3}
- 9) Using CircuitLab, determine the voltages at {V0, V1, V2, V3}
- 10) (Lab) Build this circuit using your lab on a breadboard.
 - Once built, measure the voltages at V0, V1, V2, and V3
 - Check that your answers for problem 8, 9, and 10 match (or are close)
 - Include a photo of your breadboard circuit and your multimeter with one of the readings



Notes:

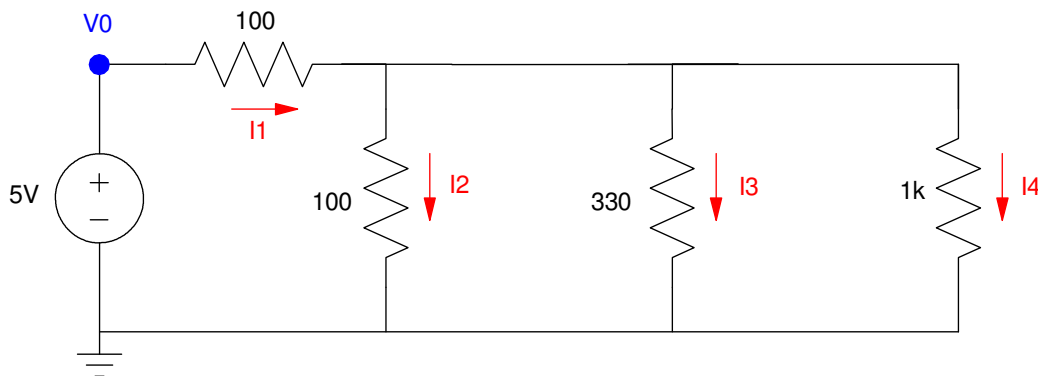
- Keep your circuit neat. It saves time.
- Use the 5V power supply (black device on right) to provide +5V (red rails) and ground (blue rails)



Sample of what your circuit might look like

Current Division

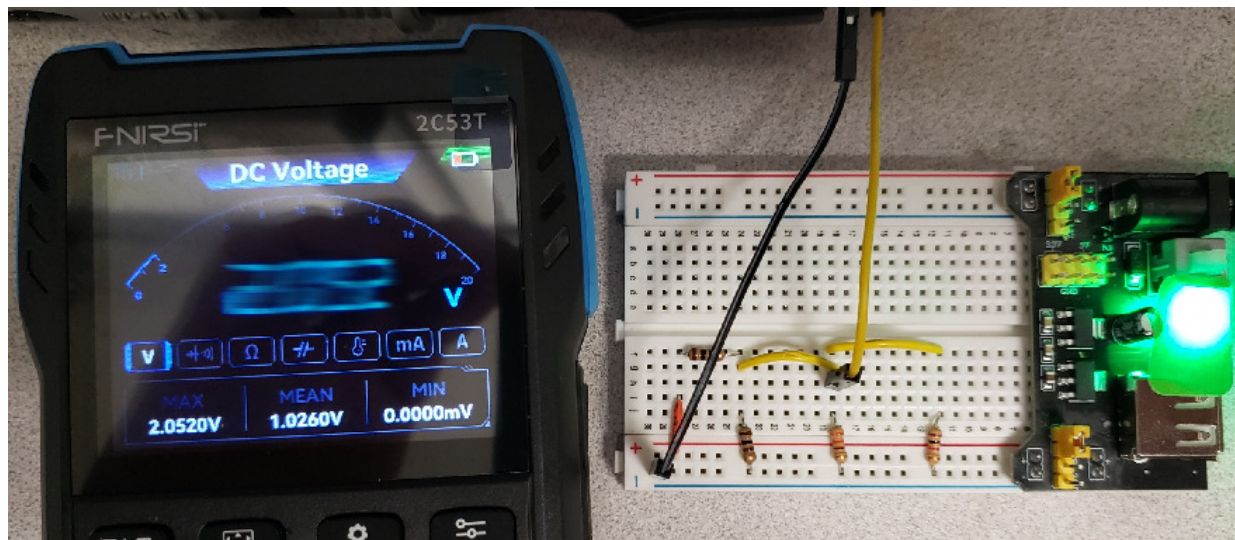
- 11) Using current division, determine the currents in this circuit
- 12) Verify your answer using CircuitLab
- 13) (Lab): Build this circuit with your lab kit
 - Include a photo of your circuit board for full credit
- 14) (Lab): Measure the currents $\{I_1, I_2, I_3, I_4\}$
 - note: To measure current, measure the voltage across a known resistor. From this, compute the current from $V = IR$



Problem 11-14

Notes:

- Keep your circuit neat. It saves time.
- Use the 5V power supply (black device on right) to provide +5V (red rails) and ground (blue rails)



Sample of what your circuit might look like