PSPICE Assignment #1

General Information:

- It is required that you use the ORCAD Capture (PSPICE) Version 10.5 or later. PSPICE is available for student use in the H-151 and H-208 computer labs. Free copies of the software are available in the back of the textbook Schematic Capture with Cadence PSPICE, 2nd Edition and in the PSPICE supplement that may come packaged with the textbook for the class. The instructor may also have a limited number of copies of the installation CD that you can borrow. You can also download the software from the instructor's website.
- When submitting a report, follow the format of the example illustrated in the "**PSPICE Sample Report**." This document is also available on the instructor's web page.
- The report that you turn in should reflect your own work for all PSPICE assignments. You may give other students limited assistance, but there should be absolutely no sharing of computer files. If two reports, schematics, or solutions look too similar, the instructor will investigate and both students could receive grades of 0 for the assignment if evidence suggests that cheating was involved.

Reference: (also see the instructor's web page)

Read Chapter 1 in Schematic Capture with Cadence PSPICE, 2nd Edition by Herniter
*Sample PSPICE Report*
PSPICE Example: *DC Circuit - Determining Node Voltages* (File: DC Circuit.opj)
PSPICE Example: *DC Circuit - Using voltage and current printers* (File: DCPrint.opj)
PSPICE Example: *Analyzing Circuits with Dependent Sources* (File: DependentSources.opj)

Assignment:

1.   Use values for Circuit 1 as follows:
   - Let V123 have a value equal to the first 3 digits of your StudentID in volts.
   - Let R1 through R6 equivalent to the digits 1 through 6 in your StudentID in kΩ (use 10 kΩ for a digit of 0).
   - For example, if your StudentID is 9870654 then V123 = 987V, R1 =9 kΩ, R2 =8 kΩ, R3 = 7kΩ, R4 = 10kΩ, R5 = 6 kΩ, and R6 = 4kΩ

   A. Analyze Circuit 1 by hand to determine
   - The current through R1 and R6
   - The voltage across R3 and R5
   - The power dissipated by R2 and R4

   B. Analyze Circuit 1 using PSPICE as follows:
   - Use a **Bias Point analysis** to find the quantities listed in part A above.
   - Adjust the placement of each value on the schematic so that it is moved slightly away from the component to avoid crowding. Do not show any current, voltage, or power values on the schematic other than those required.
   - Reminder: Be sure to add text to the schematic as indicated in the Sample Report.

   C. Include a table comparing hand values and PSPICE values. They should agree! Also include a brief discussion of the results. Add a note next to any PSPICE values that you had to modify (for example, if you used two node voltages to find a component voltage.)
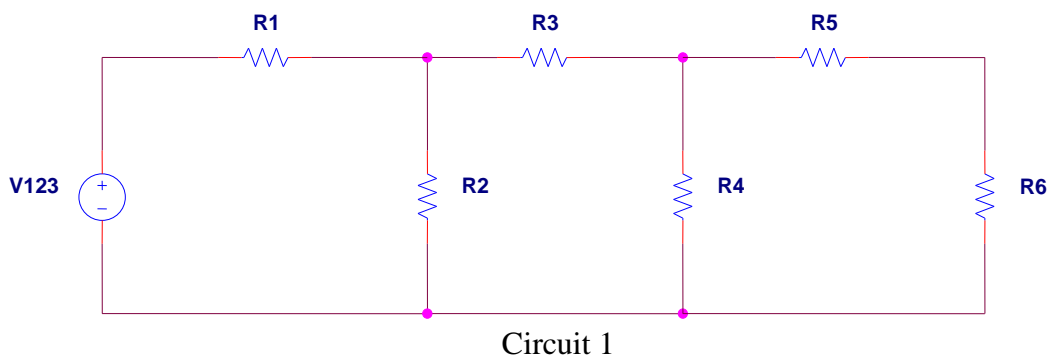
Circuit 1

2.   Problem 4.22a in Electric Circuits, 9th Edition, by Nilsson
   A. Analyze the circuit by hand as described in the textbook (find i_1, i_2, and i_3 only).
   B. Analyze the circuit using PSPICE as follows:
      • Use a **Bias Point analysis** to find the quantities found in part A above.
      • Adjust the placement of each value on the schematic so that it is moved slightly away from the component to avoid crowding. Do not show any current, voltage, or power values on the schematic other than those required.
   C. Include a table comparing hand values and PSPICE values (including the sum of the power absorbed and the sum of the power delivered). They should agree! Also include a brief discussion of the results.

3.   Problem 2.28a in Electric Circuits, 9th Edition, by Nilsson
   A. Analyze the circuit by hand (find V_y and i_B only).
   B. Analyze the circuit using PSPICE as follows:
      • Use a **DC Sweep analysis** to find the quantities found in part A above.
      • Include a voltage printer and a current printer to measure the quantities specified.
      • Do not show any Bias Point values on the schematic.
      • Clearly box and label the required values in the .OUT file and include it in the report.
   C. Include a table comparing hand values and PSPICE values. They should agree! Also include a brief discussion of the results.

4.   Problem 4.46a in Electric Circuits, 9th Edition, by Nilsson
   A. Analyze the circuit by hand (find V_Δ and i_Δ only).
   B. Analyze the circuit using PSPICE as follows:
      • Use a **DC Sweep analysis** to find the quantities found in part A above.
      • Include a voltage printer and a current printer to measure the quantities specified.
      • Do not show any Bias Point values on the schematic.
      • Clearly box and label the required values in the .OUT file and include it in the report.
   C. Include a table comparing hand values and PSPICE values. They should agree! Also include a brief discussion of the results.