# Assignment-01 (SPICE Coding)

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## Contents

### All Exercises (Resistor Only)

1. **Ohm's Law Test:** Apply 10V across a 1kΩ resistor. Calculate current.

2. **Voltage Divider:** Two 1kΩ resistors in series. Measure voltage at the midpoint.

3. **Series Network:** Connect 1k, 2k, and 3k resistors in series. Find the current through the circuit when powered by 12V.

4. **Parallel Combination:** Connect 1kΩ and 2kΩ resistors in parallel. Apply 10V. Measure total current.

5. **Power Dissipation:** Find the power dissipated in a 1kΩ resistor connected to 5V.

6. **Thevenin Equivalent:** Use a 1k and 2k series divider. Measure open-circuit voltage at the midpoint.

7. **Parameter Sweep:** Sweep a resistor from 1k to 5k and observe output voltage in a voltage divider configuration.

8. **Norton Equivalent:** Add a 1mΩ resistor to short a voltage divider. Measure short-circuit current.

9. **Wheatstone Bridge:** Construct a balanced Wheatstone bridge using four 1k resistors. Measure bridge voltage.

10. **Temperature Coefficient:** Simulate the effect of temperature on a 1k resistor with a TC of 0.004. Sweep temperature from 25°C to 100°C.