# 1st Homework Problem

- We wish to analyze the following electrical circuit.

# Problems I

1. Write down all of the equations that you need to describe this circuit mathematically. You may use either the technique involving potentials or that involving mesh equations.
2. Sort the equation system horizontally.
3. Sort the horizontally sorted equation system vertically.
4. Convert the horizontally and vertically sorted equation system to state-space form.

# Problems II

5. Program the state-space model in Matlab.
6. Simulate the circuit across **50 μsec** of simulated time, und plot the variable $v_3$ as a function of time. You may assume that the initial Voltage across the capacitance and the initial current through the inductivity are equal to **0.0**.

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