ECE 320
Homework 9.1

Given the circuit:

1. Write out all the equations describing this circuit.

2. Assign causalities to all equations, i.e., determine, which variable to solve for.

3. Create a state-space model using:
   - Input: \( U_0 \)
   - Output: \( v_3, i_C \)
   - States: \( v_3, i_L \)

4. Simulate the circuit in Matlab using the LSIM function of the control system toolbox. This toolbox is installed on the computers in ECE. “help lsim” will teach you, how to use the function.
   - Initial Conditions: \( v_3 = i_L = 0.0 \)
   - Simulation Run Length: \( t_f = 5e-5 \)

5. Plot the output variables against time using the Matlab PLOT function.