Problem 1: Simple Electrical Circuit

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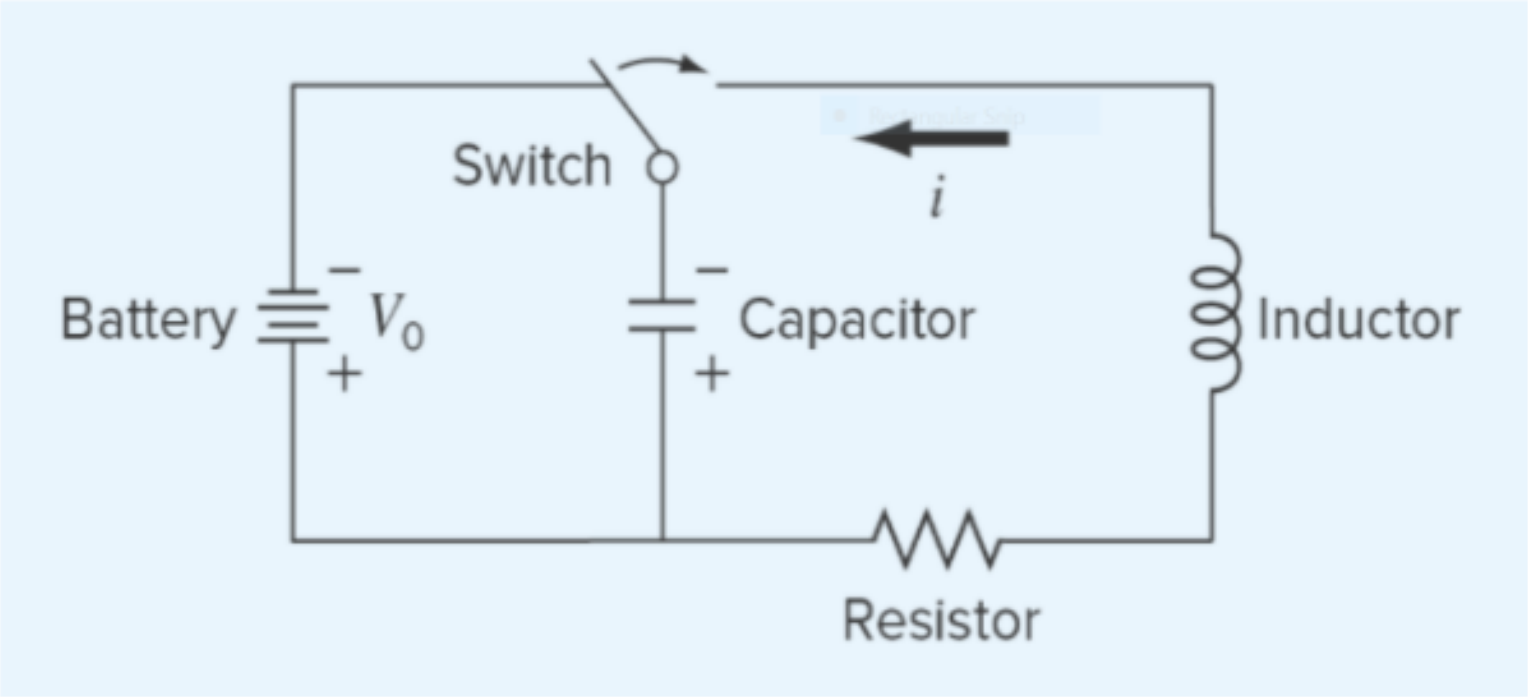
Consider a simple electric circuit consisting of a resistor, a capacitor, and an inductor as shown below



The charge on the capacitor q(t) as a function of time can be computed as:

$$q(t) = q_0 e^{-Rt/2L} \cos\left(\sqrt{\frac{1}{LC} - \left(\frac{R}{2L}\right)^2}\, t\right)$$

where:

t = time

q0 = initial charge

R = the resistance

L = inductance

C = capacitance