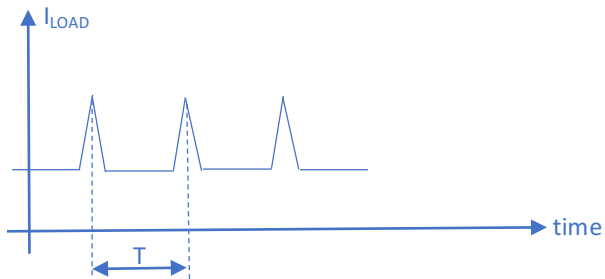# *Problem Set*

Problem

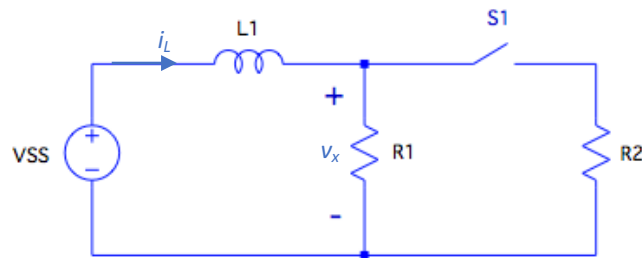Consider the following system:

The current drawn by the load is time varying.

Assuming the system can be reasonably modeled as follows:

VSS = 1.5V
L1 = 500 nH
R1 = 1 KΩ
R2 = 10 Ω
T = 5 ns

a. Sketch $i_L(t)$ and $v_x(t)$

b. For the electronic circuit (e.g. an integrated circuit) to work correctly the voltage v_x across it, should not vary more than ±100mV w.r.t. the nominal voltage supply V_{SS}=1.5V. If this is not the case how can you modify the system to fix the issue?

c. Draw a model of your "modified" system (make sure to properly size any component you add to the original model)

d. SPICE the model with and without modification and illustrate that your modification represents a significant improvement. Make sure to illustrate that the SPICE results are reasonably close to your expectations.