EE270 Homework 4

Due April 18th, 2017 @ class

Read Erickson textbook, Chapter 7.

Problems 1-3 Erickson textbook, problems 7.1, 7.10, 7.14.

Problem 4 Given a buck converter. $f_s = 10kHz$, $R = 1.5\Omega$, $C = 800\mu F$. Time range is [0, 0.04] seconds.

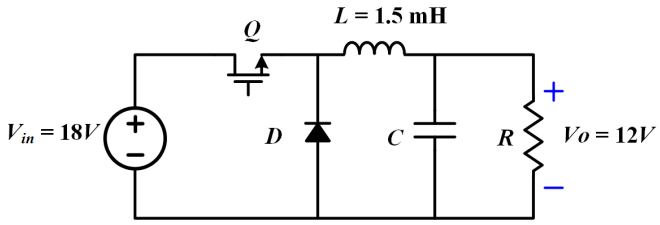

Figure 1: fig

a) Express the circuit operation in matrix form utilizing GSSA technique.

b) Assume the initial condition of the state vector is

$$X_{initial} = [x_1, x_2, x_3, x_4, x_5, x_6]^T_{initial} = [1, 1, 1, 1, 1, 1]^T \tag{1}$$

Write a program in Matlab to solve $v_o(t)$ and $i_L(t)$.

c) Plot $v_o(t)$ and $i_L(t)$ in Matlab.