CHECKPOINT #2

1. Consider the following filter circuit
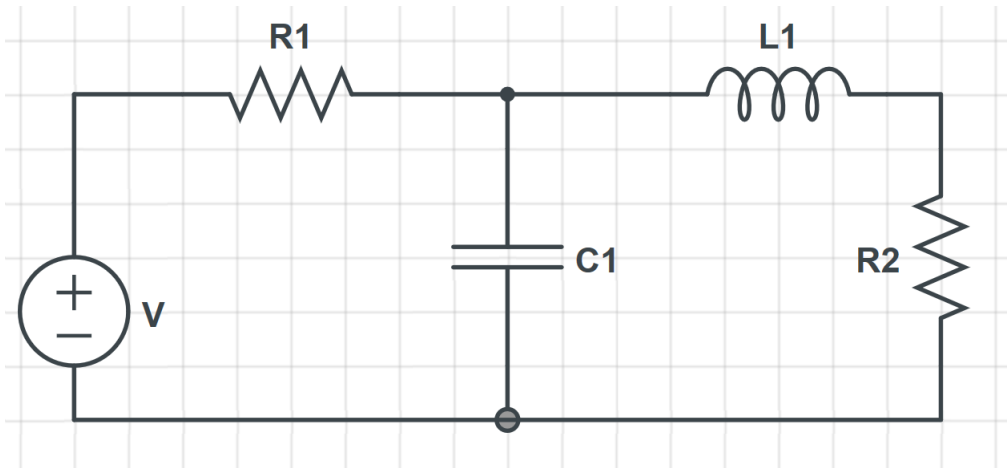

Figure 1: Filter circuit

(a) Apply the mesh analysis method considering the capacitor and the inductor in frequency domain (capacitor = $1/sC_1$ and inductor sL_1).

(b) Using symbolic variables find the current solutions.

(c) Find the transfer function $G = R_2 I_2(s)/V(s)$.

(d) Now, assuming that:

- $R_1 = R_2 = 1\Omega$
- $L_1 = 1mH$
- $C_1 = 100\mu F,$

find:

  i. The poles of transfer function;

  ii. The zeroes of transfer function;

  iii. The pole/zero map;

  iv. The impulse response;

  v. The step response.

(e) Find the state space realization with evaluated transfer function.