Case study 3: Circuits as Resonators, Sensors, and Filters

ESE 105

Name: FILL IN HERE

function myFilterCircuit(Vin,h) receives a time-series voltage sequence sampled with interval h, and returns the output voltage sequence produced by a circuit

inputs: Vin - time-series vector representing the voltage input to a circuit h - scalar representing the sampling interval of the time series in seconds

outputs: Vout - time-series vector representing the output voltage of a circuit

```
%C_3 is the lowest note in this part of the hallelujah chorus - that's
%about 130 Hz. D_5 is the highest note, that's about 590 Hz. I'm going
 to
%filter everything out that's in between

function Vout = myFilterCircuit(Vin,h)
R = 2300000/(767*pi);
L = 2500/(767*pi^2);
C = 10^-6;
V_C = 0;
V_data = [1, length(Vin)];
I = 0;

for k=1:length(Vin)
    A = [1, h/C; -h/L, 1-h*R/L];
    x_k = [V_C, I]';
    B = [0, h/L]';
    x_k_f= A*x_k + B*Vin(k, 1);
    V_data(1, k) = I*R;
    V_C = x_k_f(1, 1);
    I = x_k_f(2, 1);
end

Vout = V_data';
end
```

```
Not enough input arguments.

Error in myFilterCircuit (line 27)
V_data = [1, length(Vin)];
```

Published with MATLAB® R2021a