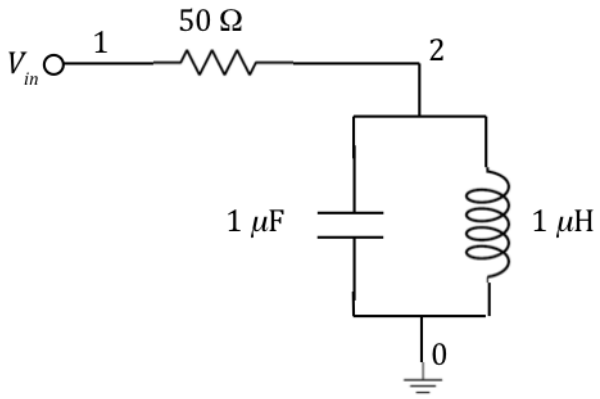
P116B SPICE Lab

January 12, 2018

Construct a SPICE netlist for the following circuit



and then do the following

1. Perform an AC analysis of the circuit (similar to the analysis of the RC filter in the lecture notes), plotting $dB(V(2)/V(1))$ versus a logarithmic scale from 1 kHz to 10 MHz, and do the following:
   (a) Show that the resonance is where you would expect.
   (b) Show that the values at 1 kHz and 10 MHz[1] are what you would expect.
2. Now drive the circuit using a pulse with a 1V amplitude, 1ns rise and fall times, and a 500 μs length.
   (a) Do a transient analysis in 1ns steps from 0 to 20μs and show that the observed ringing frequency is what you would predict.
   (b) Do a transient analysis in 1ns steps from 0 to 1000μs and observe the damping of the oscillation (no calculation necessary here).

This does not have to have a formal write up, but you should turn in your three SPICE scripts, the resulting plots, and the requested calculations.

[1] Annoyingly, the SPICE symbol for "megahertz" is "MegHz", not "MHz".