

Analog IC Design Intern Application

Lab#1: SPICE

Prepared by:

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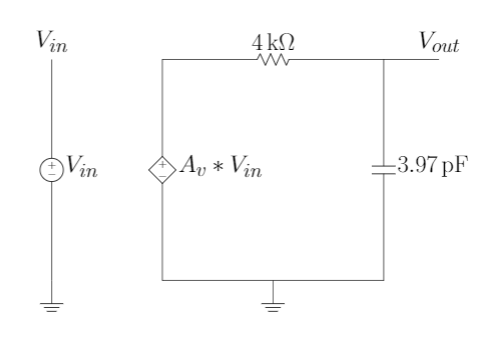
Reasons For Sending After OverDue and not being accepted:

1. I understood the problem Correctly after searching it was easier than I expected
2. I would like to know a feedback on my work because I may did something wrong again because I learn well this way
3. The question in interview was so easy but I didn’t answer because I worried you ask a harder question about analog design not control theory,
4. I studied control theory last year and we built analog low freq. filters based on mathematical modeling approaches which we learned while studying control theory course

1. I didn’t remember all of this as it was long time ago and this year of study we were focusing on electro-magnetics theory and microwave-antenna design approaches.

# Requirement 1: SPICE subcircuit that describes an op-amp with an open-loop gain of 1e4 and a UGF of 10MHz.

1. **Circuit Diagram:**



## Equations:

## Spice Netlist Code:

\*-----------------------------------------------

\*Requirement 1

\*-----------------------------------------------

.subckt nonidealopamp plus minus out

E1 mid gnd plus minus 1e4 \* **linear-dependent** voltage source to model opamp

R1 mid out 4k \* R1

C1 out gnd 3.97pf \*C1

.ENDS nonidealopamp

# Requirement 2: Use the previous sub circuit to write a netlist of a non-inverting amplifier. The feedback resistance is 9kOhm and the other resistance is 1kOhm. Use a 1V DC input. Use comments generously to describe every line of the netlist. Run transfer function (TF)analysis. Report a snapshot of the SPICE output file. Justify the output.

## Spice Netlist Code

Xop1 gnd minus out nonidealopamp

R1 in minus 1k \* The other resistor

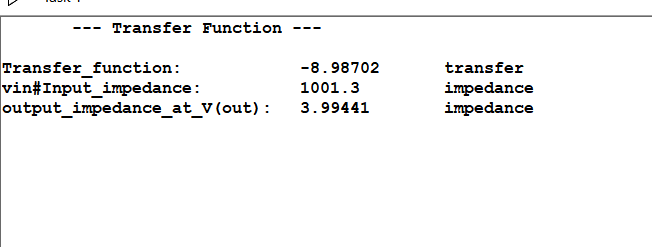
R2 minus out 9k \* Feed back Resistor

Vin in gnd 1V

.tf V(out) Vin

.probe

## 2.2. Simulation



## 2.3. Analysis Equations