Structured Electronic Design

EE3C11
SLiCAP

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Symbolic **Li**near **C**ircuit **A**nalysis **P**rogram

and

Structured Electronic Design:

Circuit (topology) synthesis	Functional requirements Find operating principle Apply error reduction techniques	SPICE netlist with symbolic circuit parameters
Symbolic performance analysis	Performance parameters as a function of design parameters	SLiCAP symbolic circuit analysis results
Obtain design equations	Design parameters as a function of performance parameters	SLiCAP symbolic parameter analysis
Solve design equations	Design parameters or show stoppers	SLiCAP numeric parameter solution
Numeric design verification	Numeric performance analysis	SLiCAP graphs, tables and reports

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Capabilities

Symbolic and numeric analysis of linear time-invariant dynamic circuits

- Transfer functions (Laplace Transform and Fourier Transform)
- Time domain analysis (inverse Laplace Transform)
- Pole-zero analysis

Symbolic and numeric noise analysis

- Symbolic and numeric source and detector referred noise spectra
- Symbolic and numeric noise integration

Symbolic and numeric statistical DC analysis

- Symbolic and numeric source and detector referred DC variance

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Design Education

Helps the students focus on the evaluation of analysis results rather than on the analysis itself

Helps the students to verify their own assumptions

Helps the students to create HTML design reports with: equations, tables, graphs and images

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Demonstration

Download

Requirements and installation

MyFirstRCnetwork

- Jupyter notebook
- python IDE
- ASCII editor and terminal

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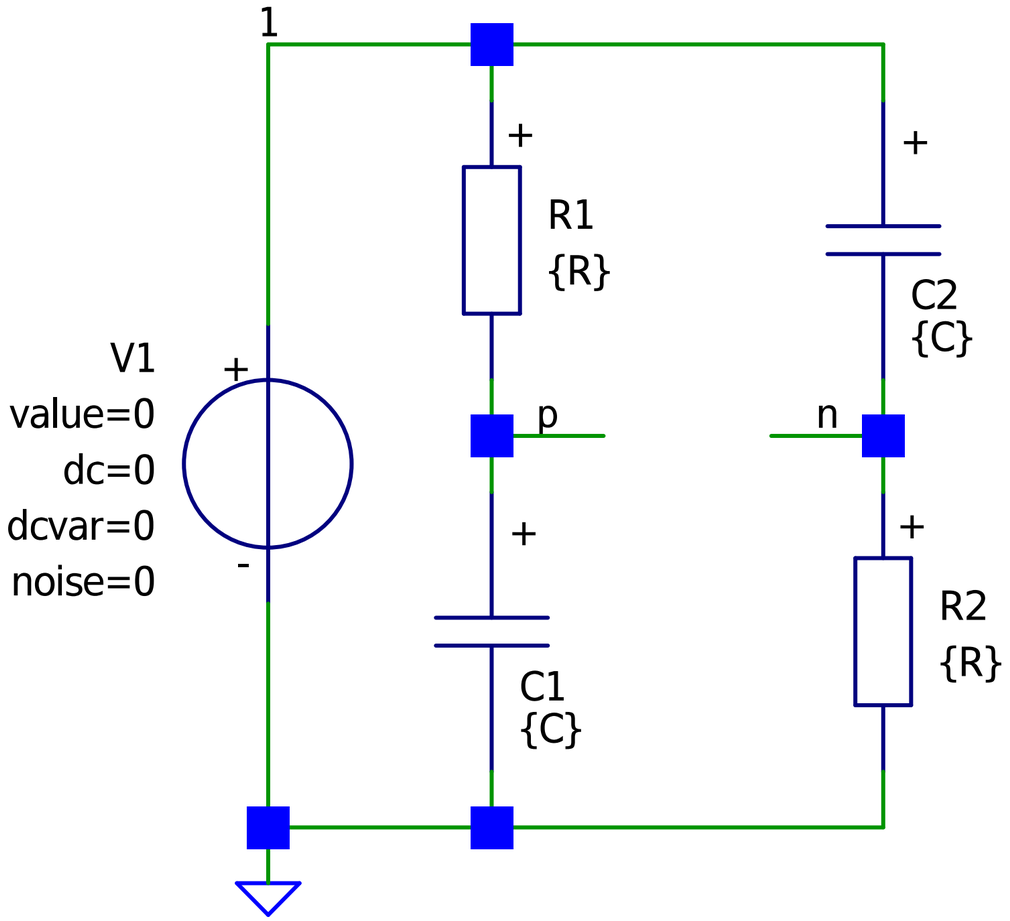

Assignment (5pts)

Obtain a symbolic expression for the transfer from V1 to the voltage between node p and node n

Plot the magnitude characteristic of this transfer with R=15.9k and C=1nF

Plot the phase characteristic of this transfer with R=15.9k and C=1nF

Plot the unit step response of this transfer with R=15.9k and C=1nF

Print the poles and zeros of this transfer with R=15.9k and C=1nF

Add a text paragraph in which you evaluate the obtained results

Put the above results in an HTML report, zip the HTML subdirectory of this project and upload it in Brightspace with the file name: <studentNumber>.zip