EE330 lab 6 Supplemental Instruction How to setup parametric analysis

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Step 1

set up variables for "vgs" and "vds"

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Step 2

Open **ADE L** by in the dropdown menu of **Launch**. Right click in the **Design Variables** window and then choose **Copy from cellview** to call all the variables you just created in the schematic.

👻 Virtuoso® Analog Design Environment (1) - lablib lab6 schematic
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Design Variables
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Design Variables	
_ Name	Value
1 vds	0
2 vgs	0
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Two variables you just created will show up, then set up values for them. (These values can be used for one time simulation)

Step 3

set up **DC anlysis** and also **outputs** you want to plot. In this case we want to plot the current going through the NMOS.

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Since we want to plot the current, click on the node to choose current as output (don't click on the net, this is important), then press ESC.

Step 4

Set up parametric analysis

lab6 sche	matic			
<u>O</u> utputs	<u>S</u> imulation	<u>R</u> esults	<u>I</u> ools <u>H</u> elp	
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111	M Parametric Simulation Completed.										
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	Variable	Value	Sweep?	Range Type	From	To	Step Mode	Total Steps	Inclusion List	Exclusion List	
vds		5	V	From/To	1	5	Auto				
vgs		5	V	From/To	1	5	Auto	5			

This is my voltage range setting, you may set up as you wish, also play around with step sizes and step mode to see how they affect your simulation. After setup the parametric analysis, click on green play button to run.

After the simulation window pops up, some of you may have vgs on your X-axis instead of vds, you can fix this by right click the X-axis and name and choose "swap sweep variabl...".

Alternative way to add outputs if the simulation result window doesn't pop up

Choose setup.

👻 Virtuoso® Analog Design Environment (1) - lablib	lab6 schematic		
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Name	To Be Sa <u>v</u> ed 🕨 🕨		Value
1 vds	To Be <u>P</u> lotted >		
2 vgs	Save <u>A</u> ll		

Click on **Open**

For the setting outputs Virtuoso® Analog Design Environment (1)	Enable X
Selected Output	Table Of Outputs Name/Signal/Expr Value Plot Save Options
Name (opt.)	
Expression From Schematic	
Calculator Open Get Expression Close	
Will be Vlotted/Evaluated	
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Hdd Delete Change Next New Expression	
	OK Cancel Apply Help

In the new window choose **Idc**

✓ Virtuoso (R) Visualization & Analysis XL calculator
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Click on the node

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Then the current equation will be automatically inserted in the window.

➡ Virtuoso (R) Visualization & Analysis XL calculator
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Ovt Ovf Ovdc Ovs Op Ovar Ovn Osp Ovswr It If Idc Is Opt Mp Ovn2 Ozp Opp
C Off C Family Wave Clip Append Ke Ke Ke
7 8 9 /

Go back to the setup window. Cick "get expression" and click "add", then click "ok"

	_ Type	Enable
- <u> </u>	Selected Output	Table Of Outputs
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Expression	IDC("/N1/D") From Schematic	
Calculator	Open Get Expression Close	
Will be	Plotted/Evaluated	
Add	Delete Change Next New Expression	
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Now go back to parametric window and rerun the simulation.