CND 101 - LAB [2]

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A- Thevenin's and Norton's theorems verification

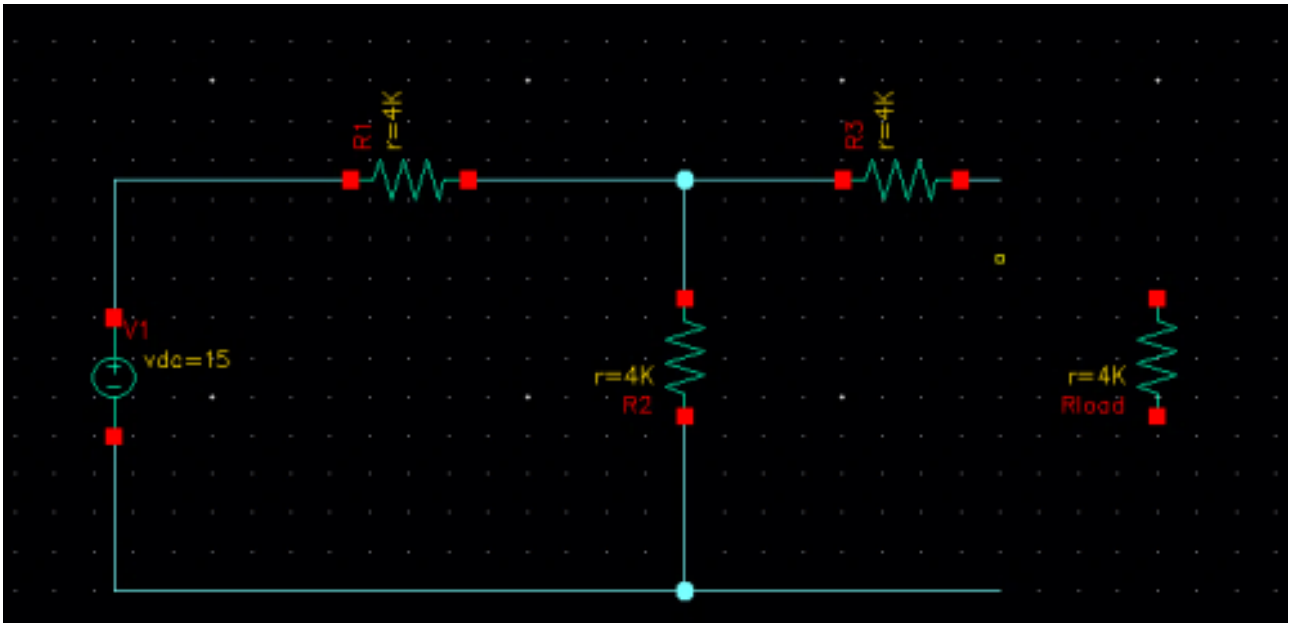
	V across RL	I in IL
Original cct.	3v	750u
Thevenin's equivalent	3v	750u
Norton's equivalent	3v	750u

3- Comment on how this verifies Thévenin's and Norton's theorems

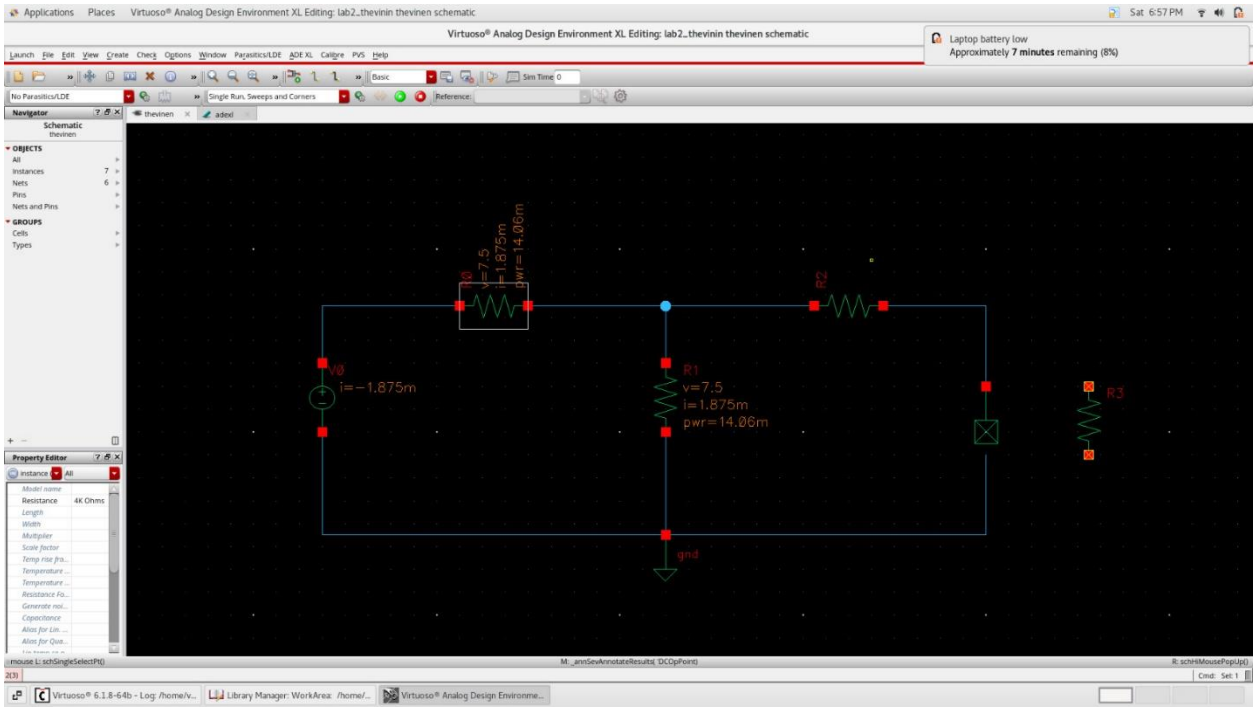
Comment: we have the same current and same voltage drop across RL when we solve the main circuit or Thevenin's equivalent or Norton's equivalent.

Additionally, Maximum power transfer happens when R Thevenin = R Load

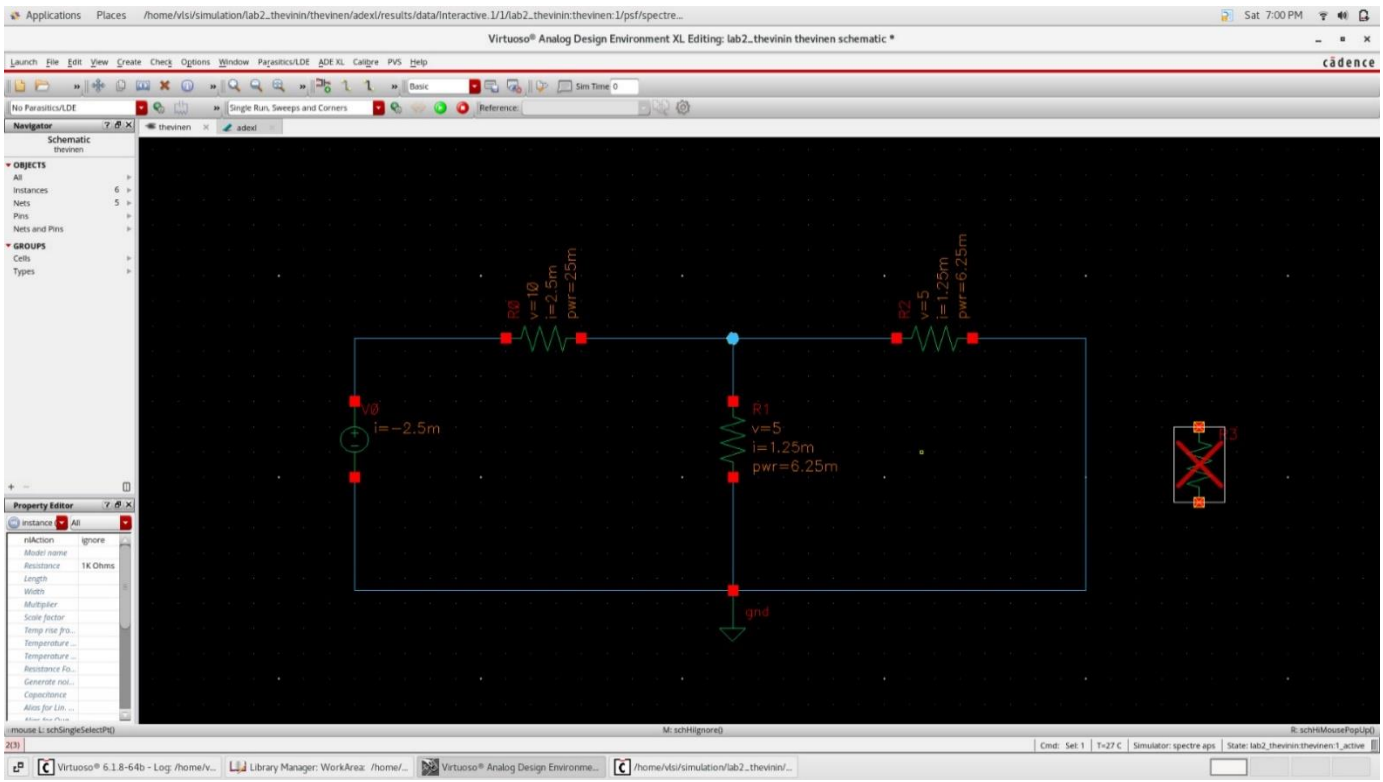
schematic:



open circuit to get V Thevenin



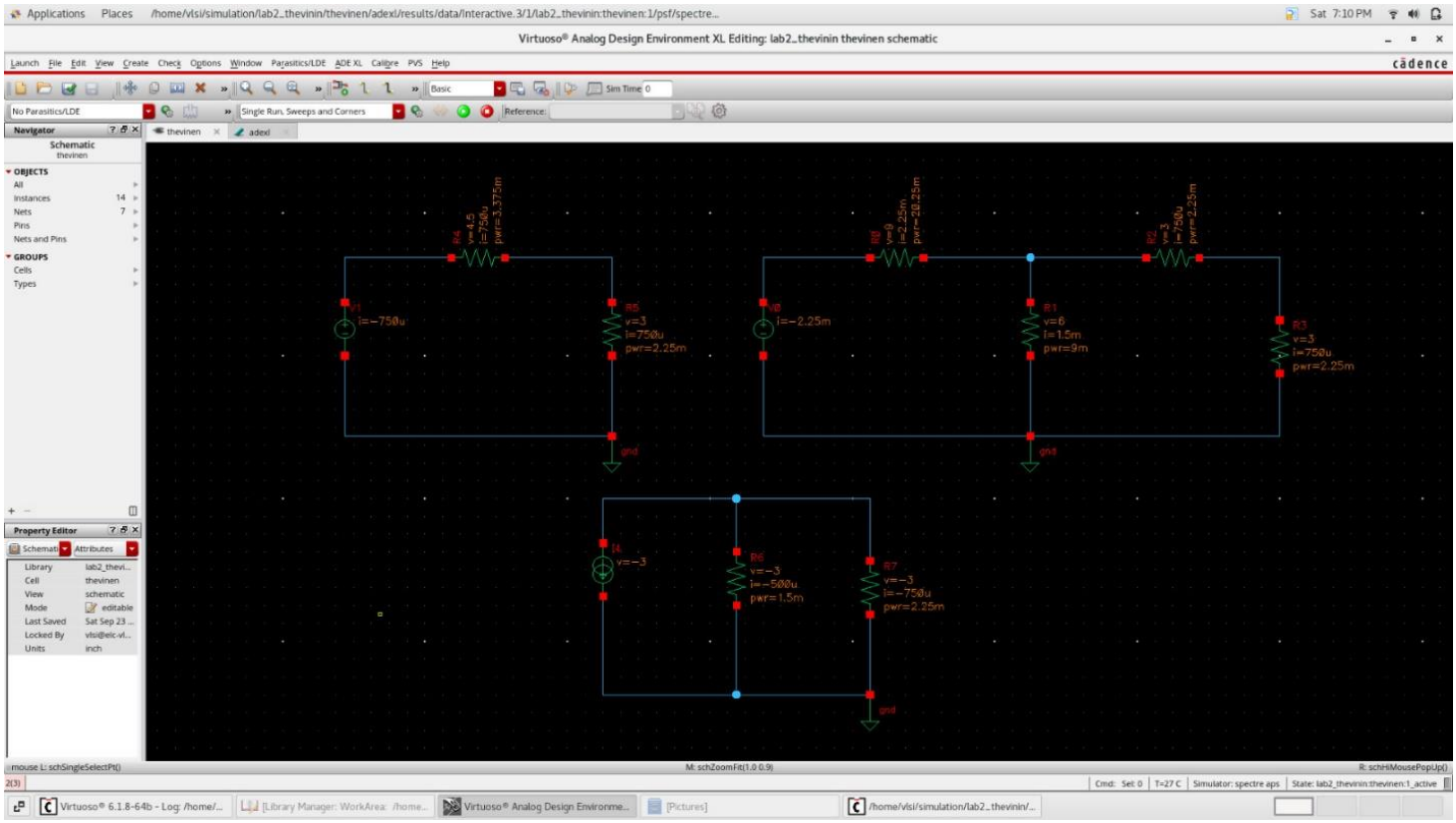
Short circuit to get I norton



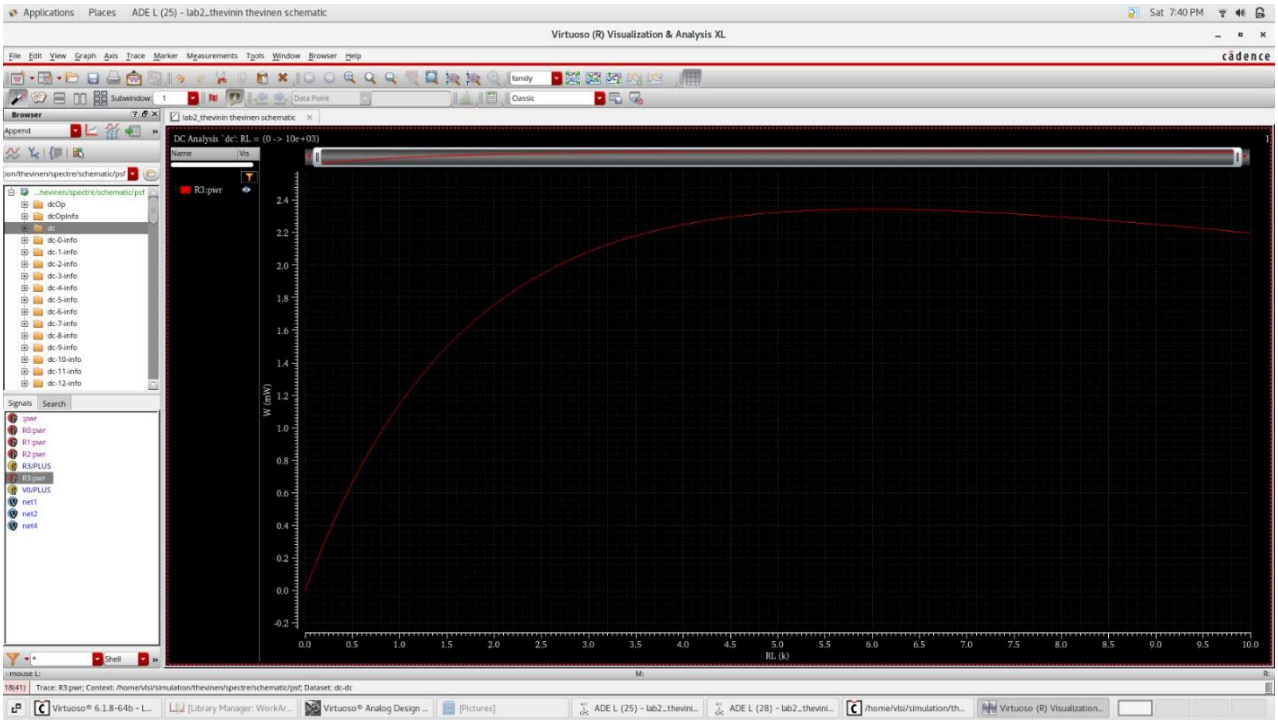
Main Circuit on the right

Norton equivalent on the left

Thevinin equivalent at the bottom

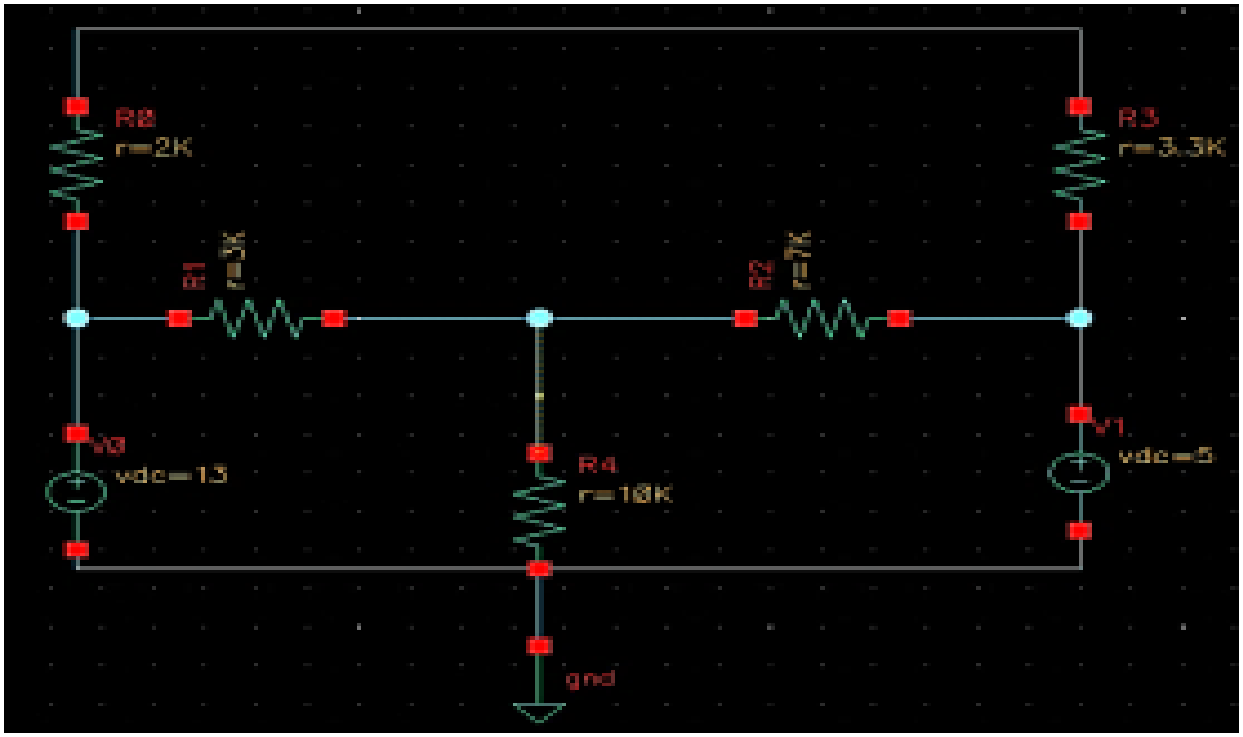


Maximum power happens when Rth = RL

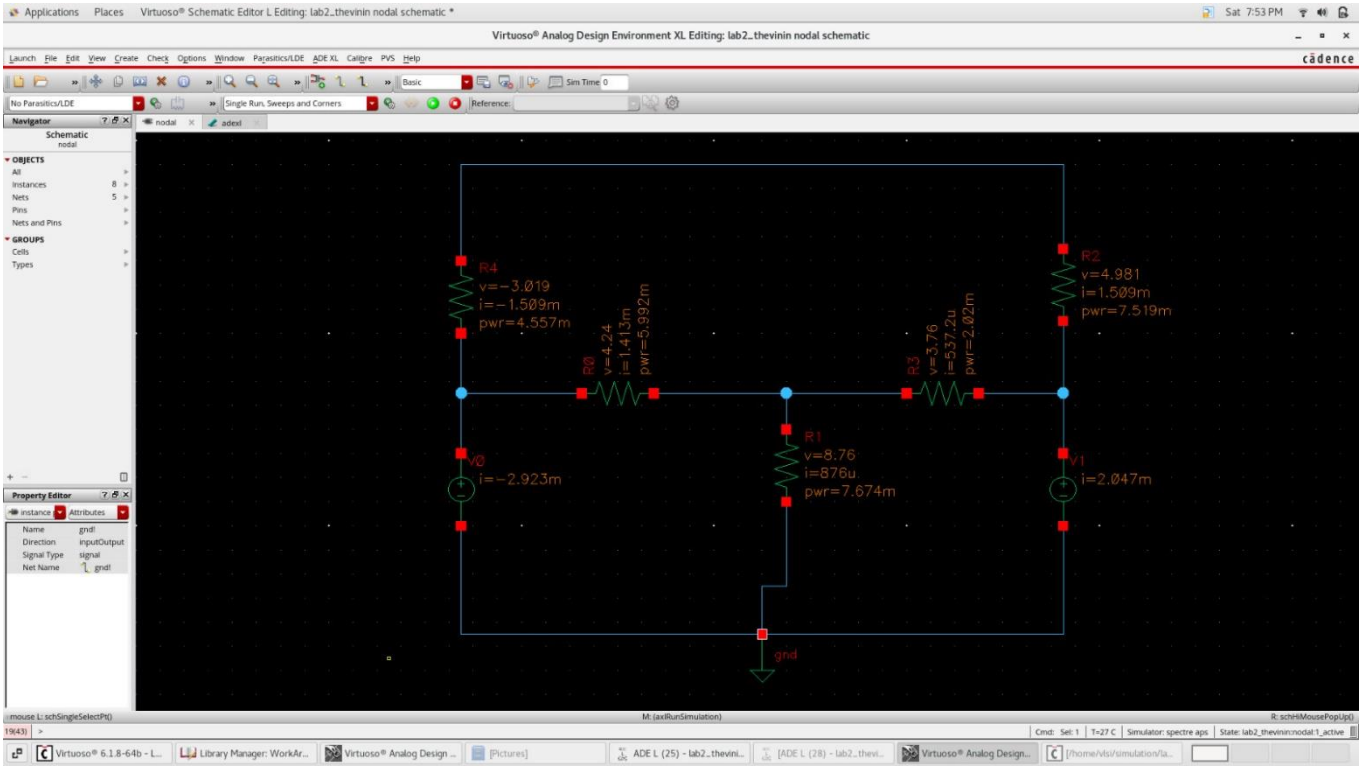


B-Nodal-Analysis Technique:

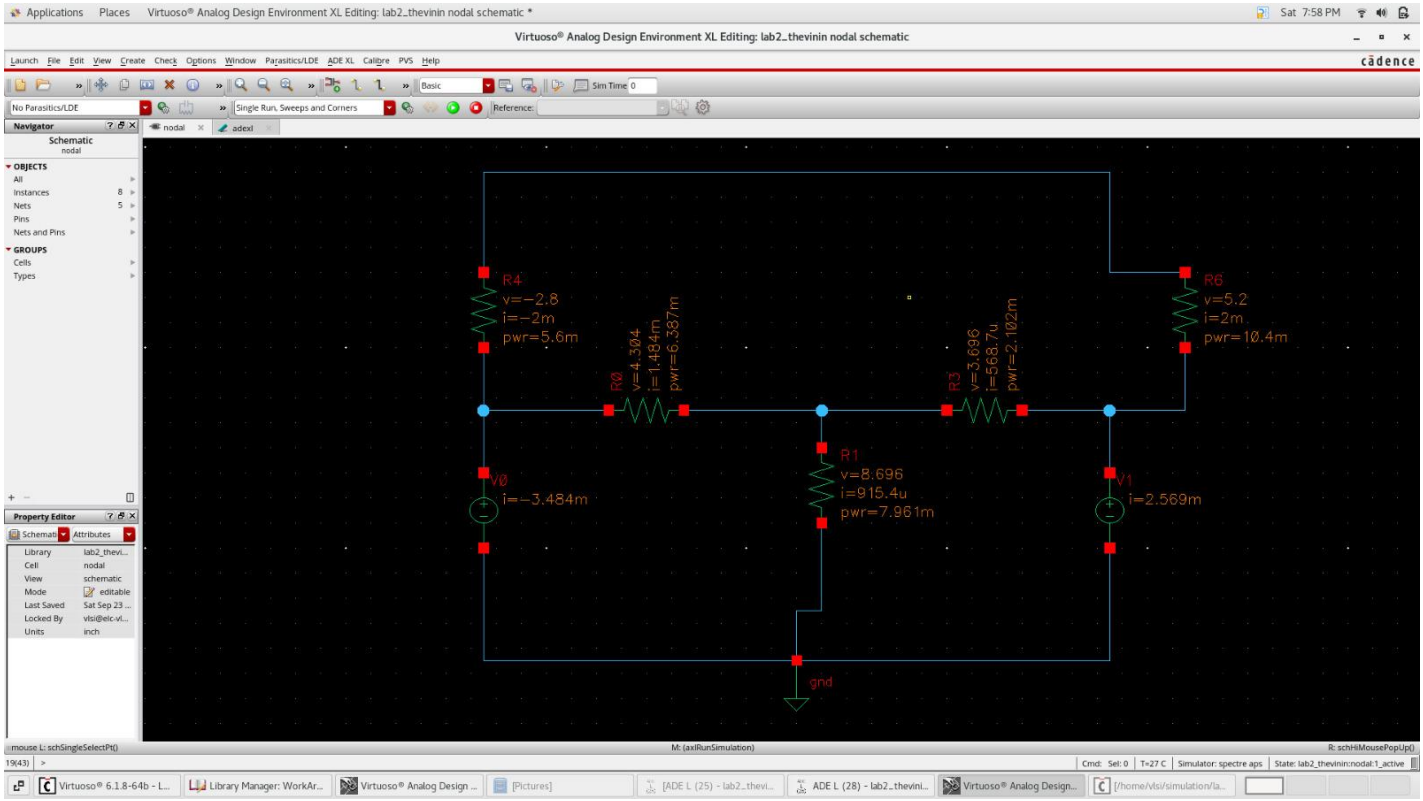
	Vs1	Vs2	R1	R2	R3	R4	RL
Value	13v	5v	2k	3k	7k	10k	3.3k
Value	13v	5v	1.4k	2.9k	6.5k	9.5k	2.6k



First row values of resistors in the table above



Second row values of resistors in the table above



	V1	V2	VL
For the first row values	8.76v	13v	5v
For the second row values	8.696v	13v	5v

	I1	I2	I3	I4	Is1	Is2	IL
For the first row values	-1.509m	1.413m	537.2u	876u	-2.923m	2.047	1.509m
For the second row values	-2m	1.484m	568.7u	915.4u	3.484m	2.569m	2m

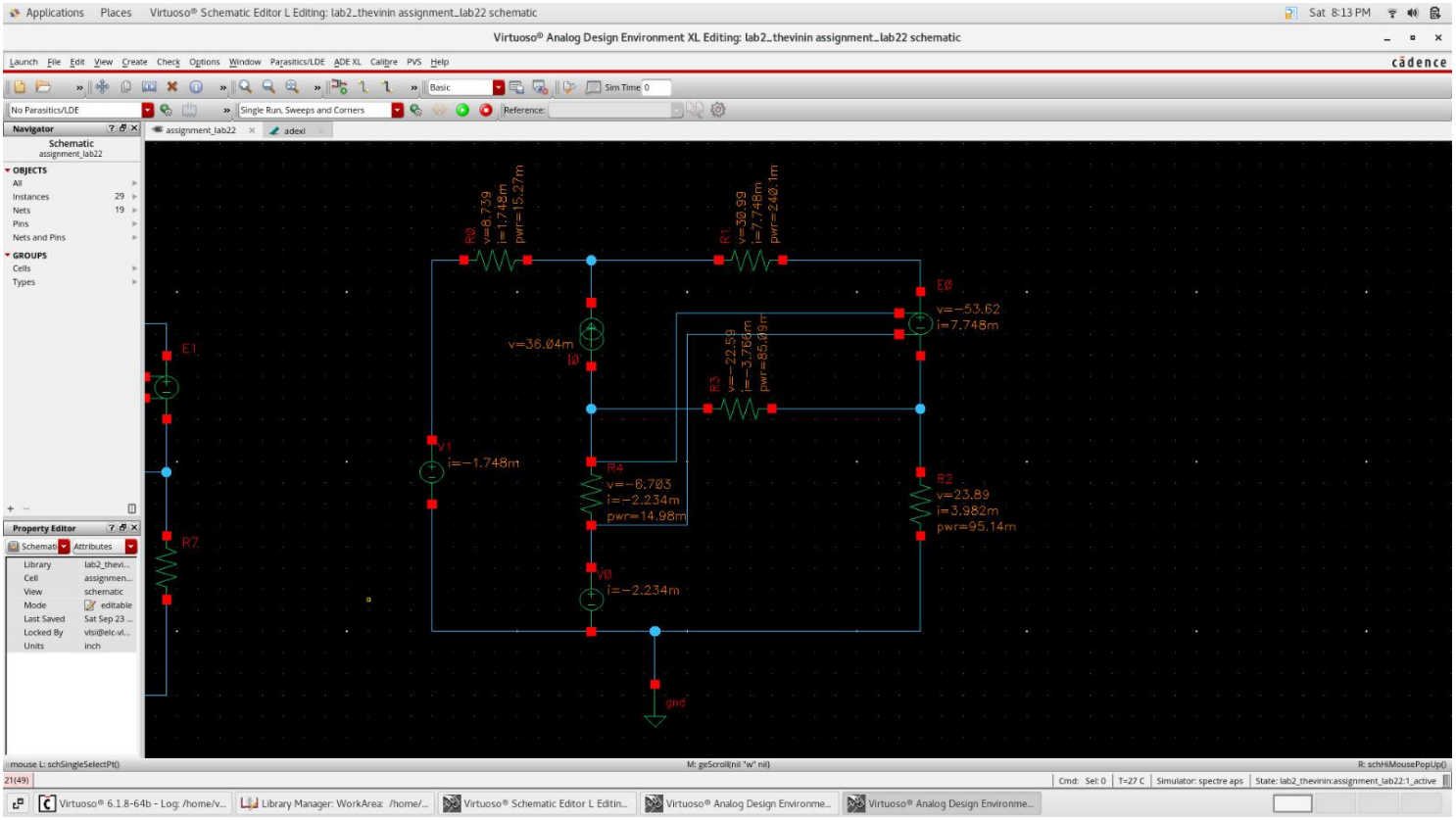
	Pvs1	Pvs2	∑Pvsj
For the first row values	-37.999m	10.235m	-27.764m
For the second row values	-45.292m	12.845m	-32.447m

	PR1	PR2	PR3	PR4	PRL	Sum PRi
For the first row values	4.557m	5.992m	2.02m	7.674m	7.519m	27.762m
For the second row values	5.6m	6.387m	2.102m	7.961m	10.4m	32.45m

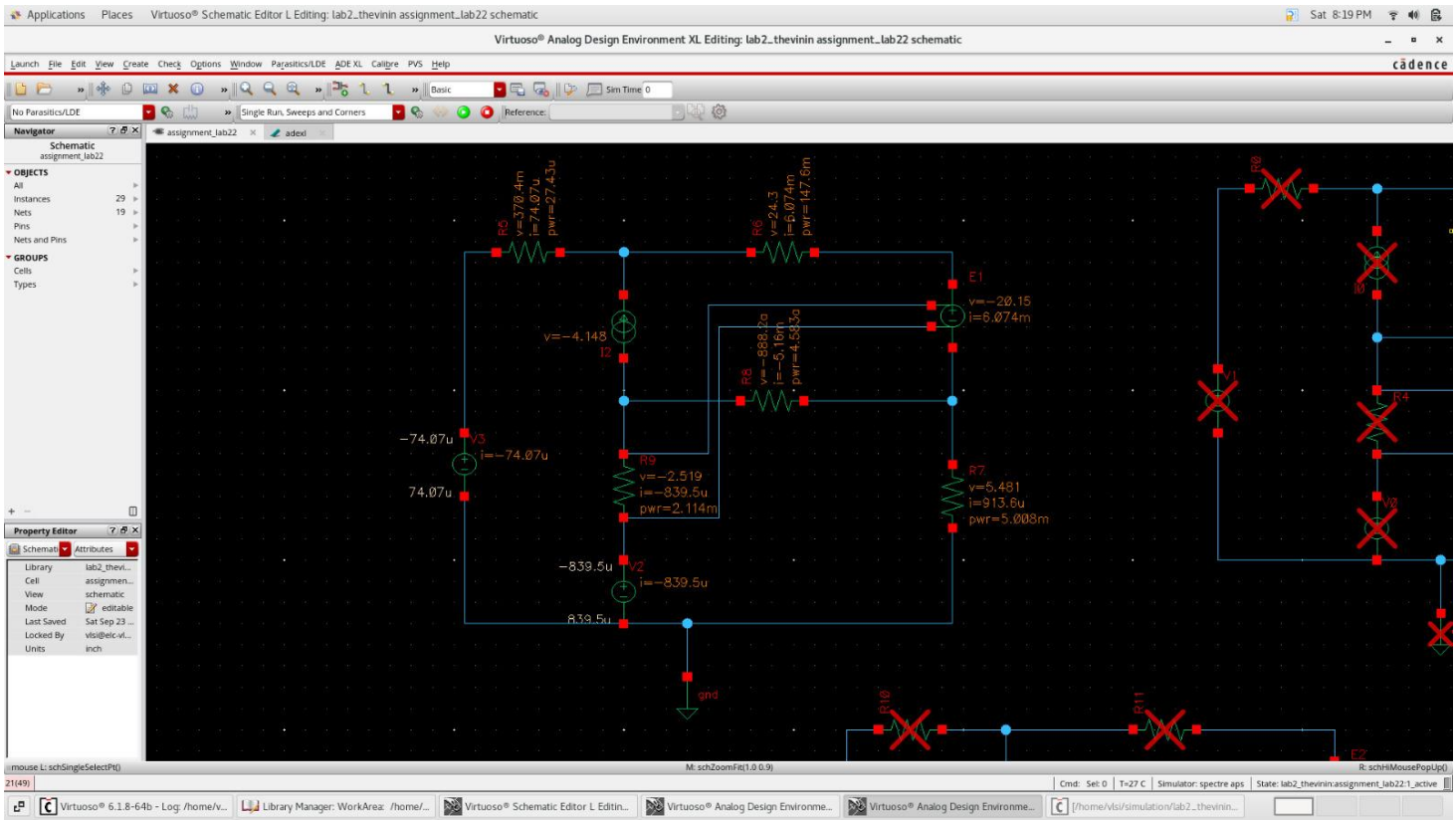
	∑Pvsj	∑PRj	% out of balance
For the first row values	-27.764m	27.762m	0.002%
For the second row values	-32.447m	32.45m	0.003%

Assignment 2

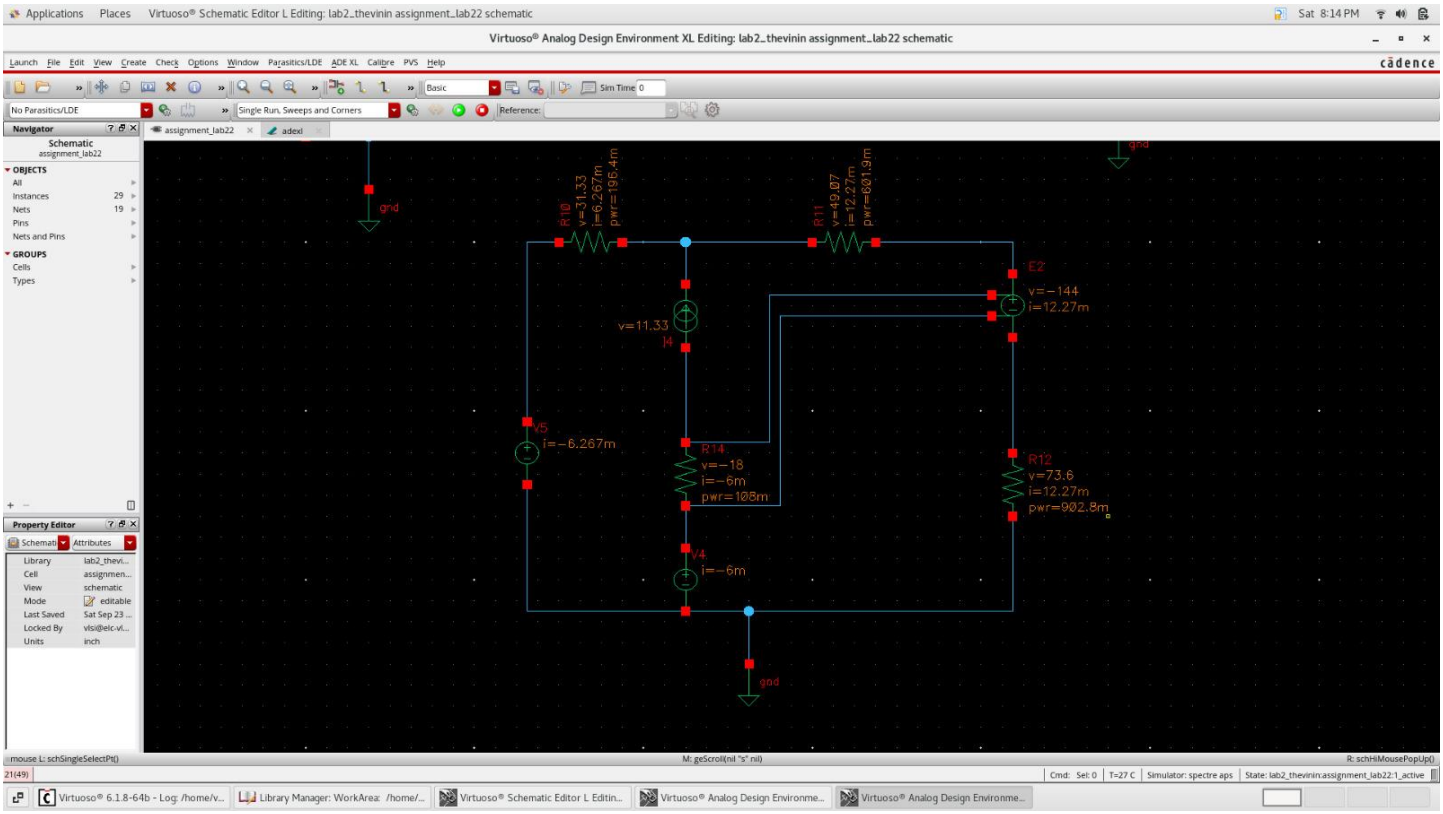
Main Circuit



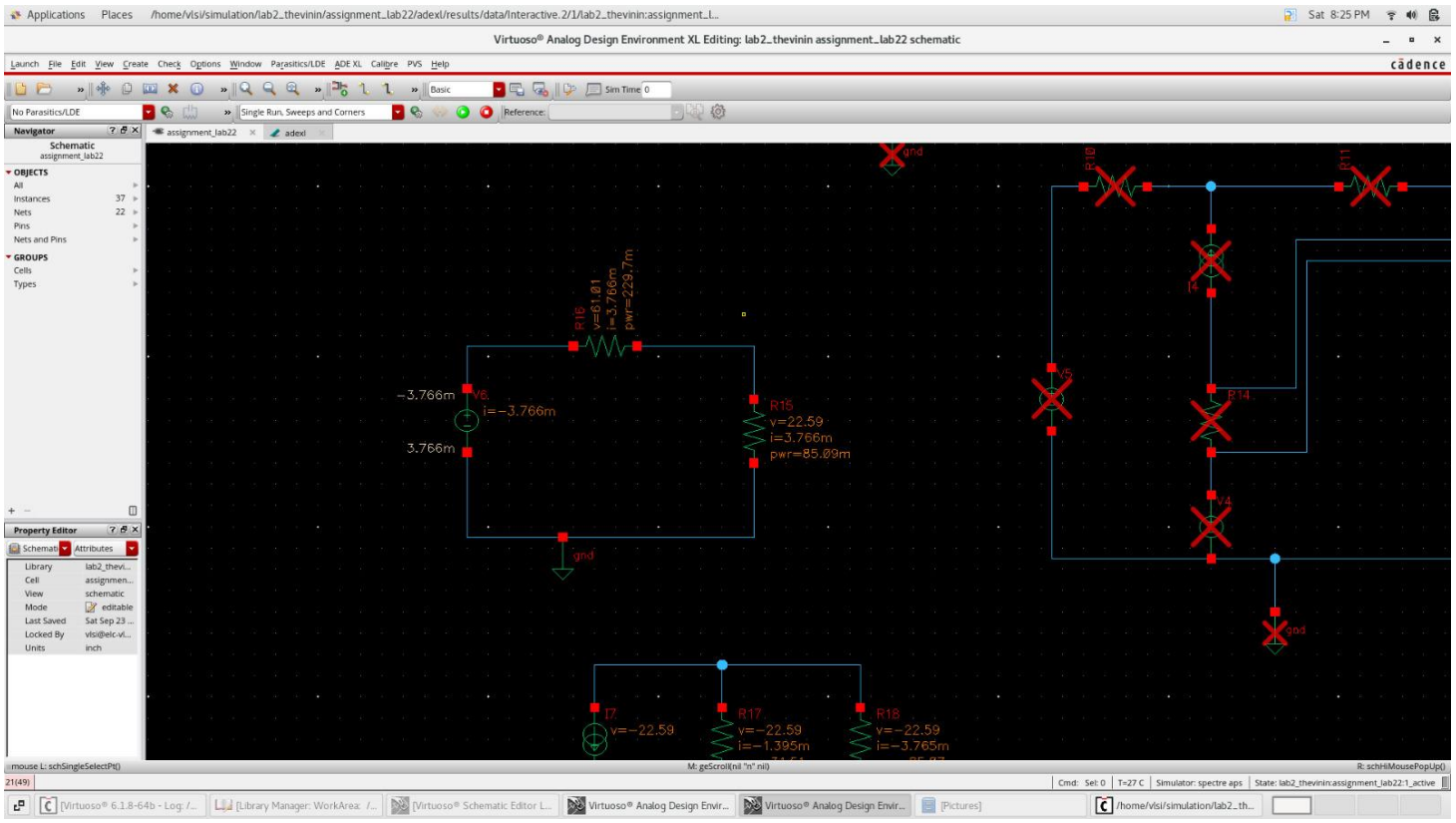
I Norton (short circuit) ➔ (RL is equal to 0 here)



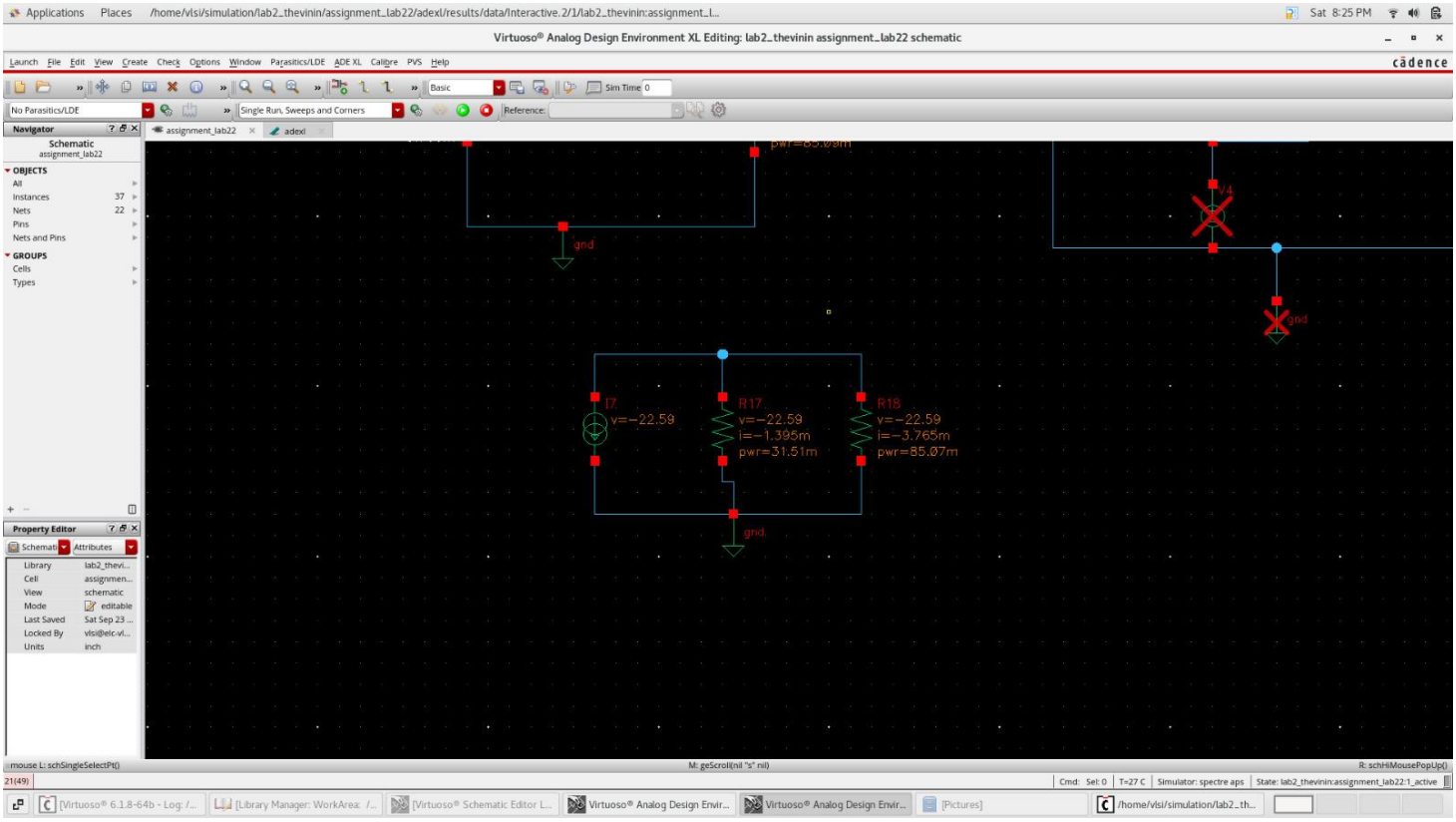
V Thevinin (open circuit)



Thevinin equivalent Circuit



Norton Equivalent circuit



Max power Transfer happens when RL = RTH