Report

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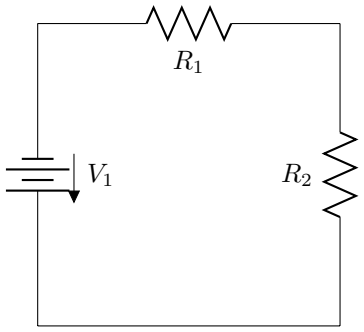
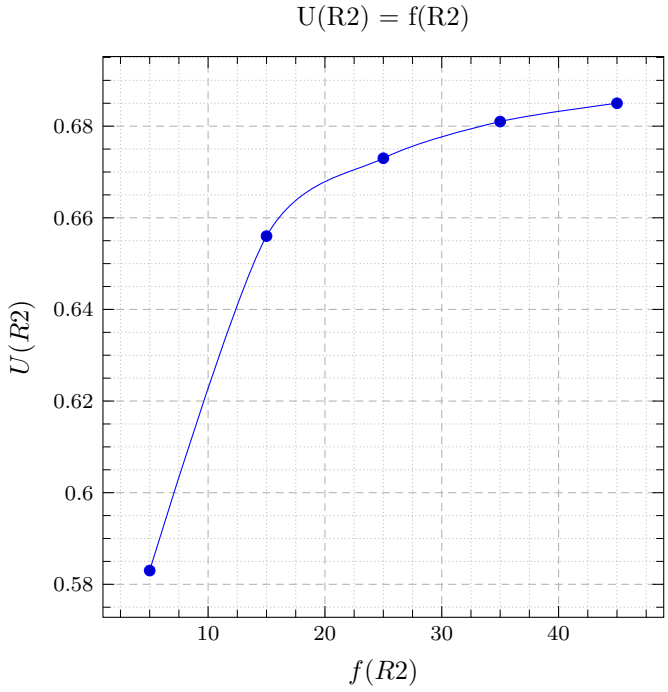
Chapter 1

Theoretical Part





1.1 Circuit calculation

Calculated the Voltages on the Resistors R1 and R2 in DC circuit using Voltage Division Rule.

$$V_{R1} = (V_1 \times R_1)/(R_1 + R_2)$$

$$V_{R2} = (V_1 \times R_2)/(R_1 + R_2)$$

Variable	Value
R_1	1
R_2	1
V_1	0.7V
V_{R2}	0.35V
V_{R1}	0.35V

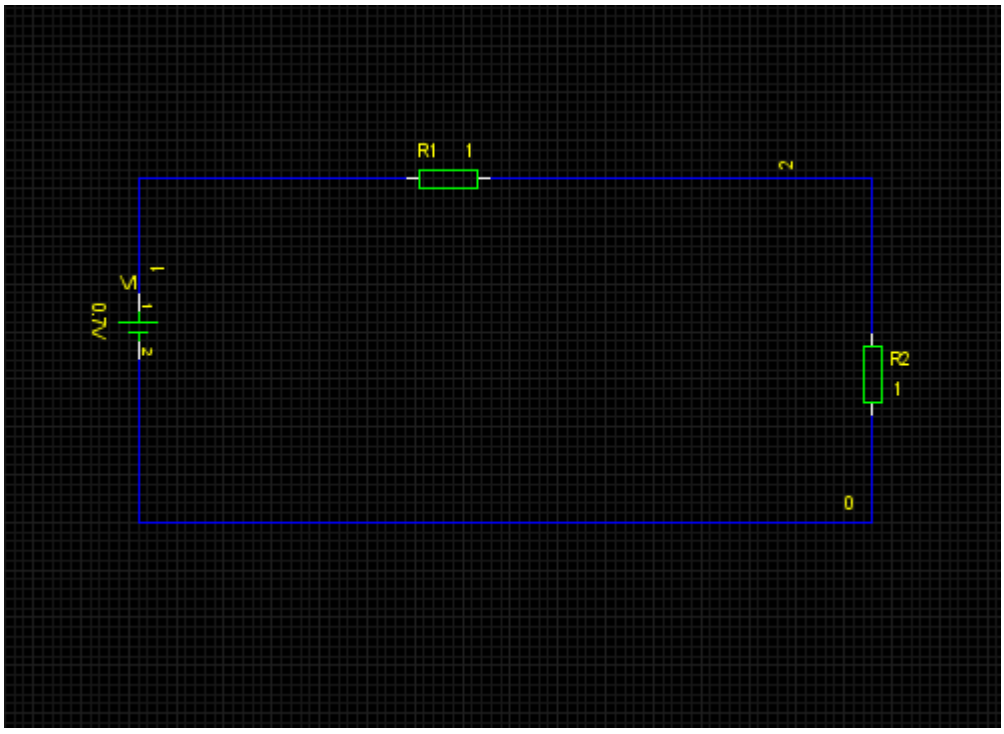
Figure 1.1: Table

Chapter 2

Practicle Part

2.1 Work with GEDA programs

2.1.1 Work with gschem



2.1.2 Work with gnetlist

* Spice netlister for gnetlist V1 1 0 0.7V R2 0 2 1 R1 1 2 1 .END

2.1.3 Work with ngspice

This is the picture i got from plotting Connectin ”1”

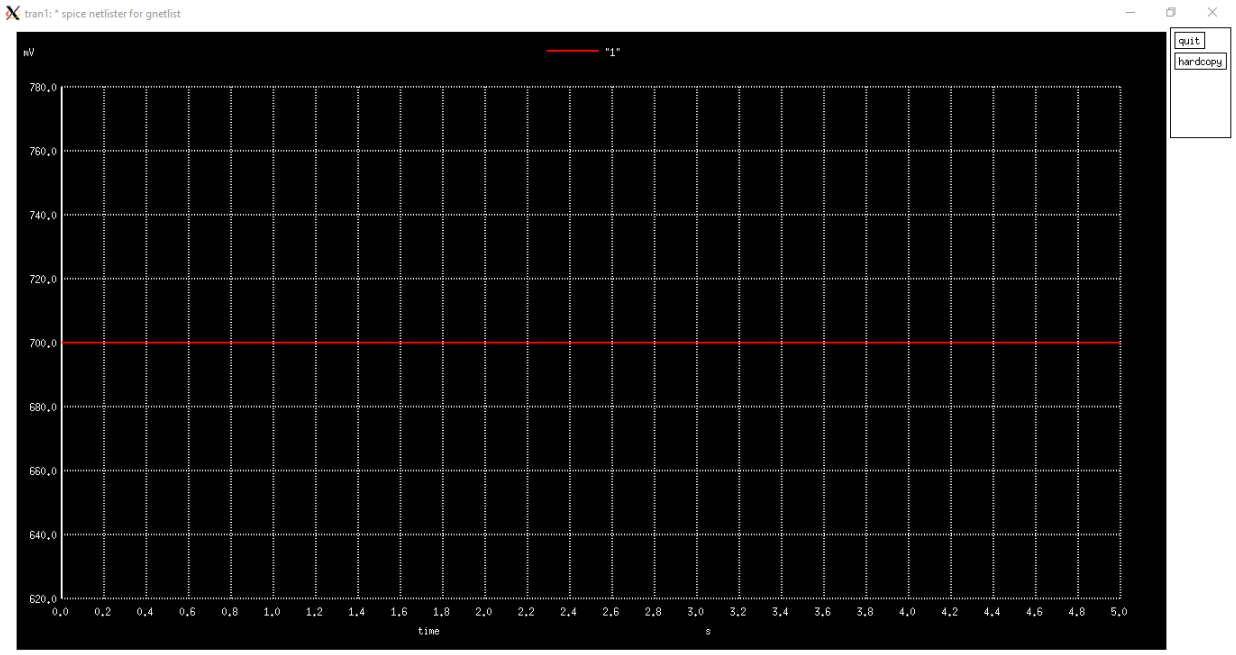


Figure 2.1: 011.png

This is the picture i got from plotting Connectin ”2”

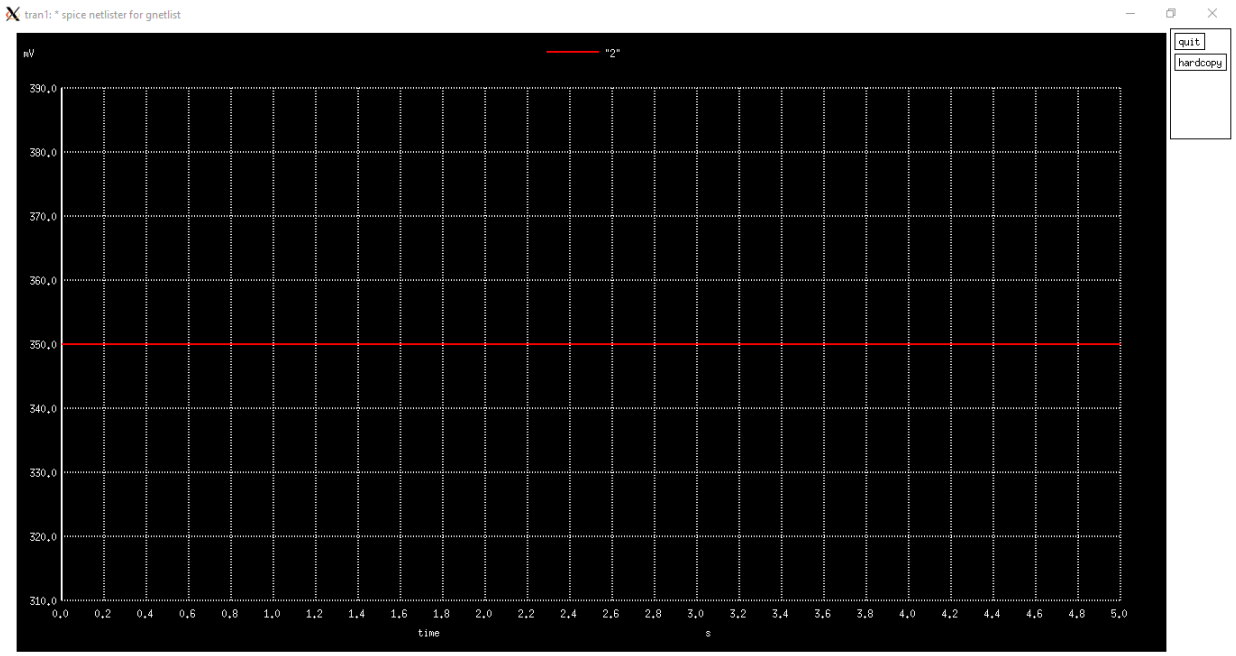


Figure 2.2: 012.png

2.2 work with QUCS programs

I setup a circuit with a graphical user interface (GUI) and simulate the DC signal and noise behaviour of the circuit. After that simulation has finished i viewed the simulation results on a presentation window.

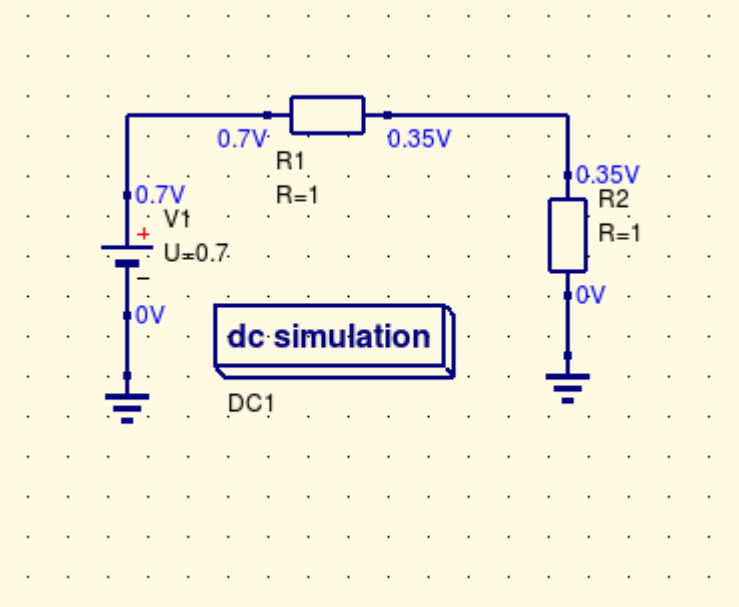


Figure 2.3: The QUCS schematics environment

- Perform elementary DC mode simulation with the F8 key, which results in calculations and determines the voltage on the resistor R2.

- It is shown in the image as 0.35V.

- The simulator variable that derives this value is designated R2.V.

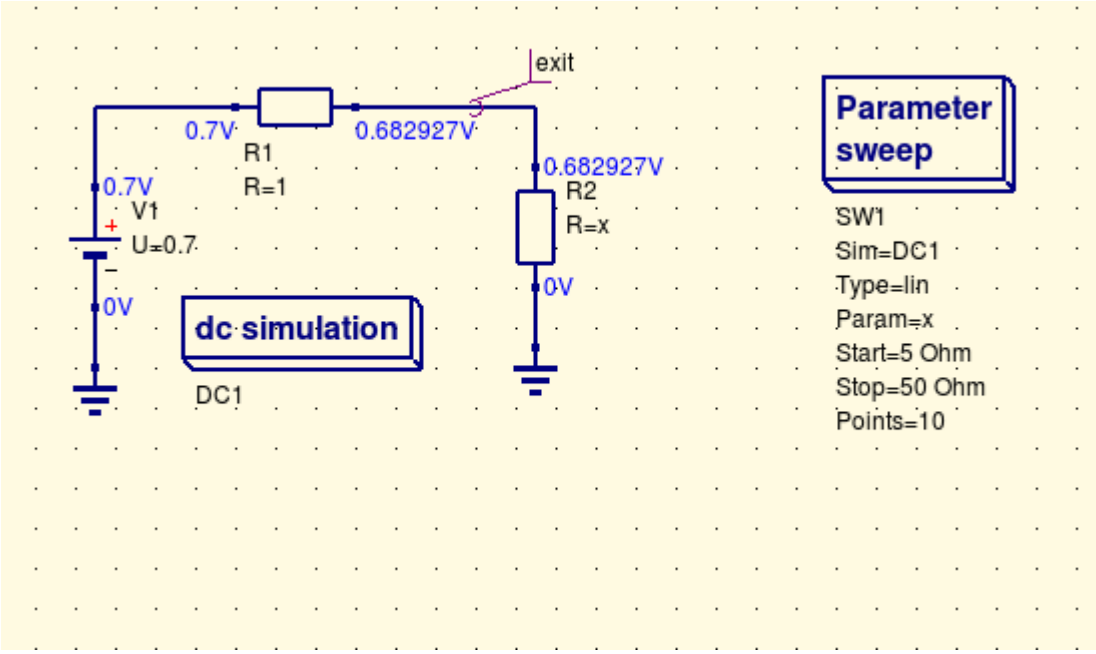


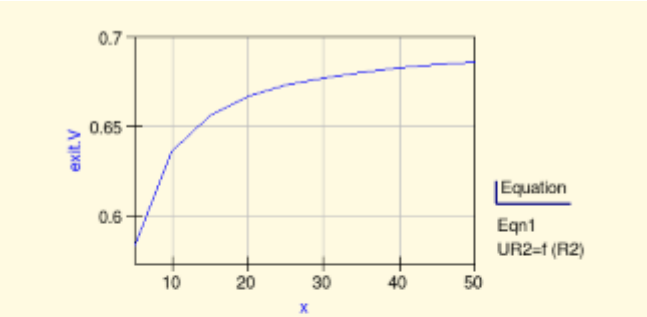
Figure 2.4: Parameter sweep mode

- the value of resistor R2 to the symbol x, which will serve as the argument for the current circuit calculation.
  symbol: x has also written in the Param field of the component 'parameter sweep' attribute field.

- Changed the number of points to 10. simulating parameter x changed linearly

- value 5 Ω to 50Ω at eleven points, where all the parameters of the circuit (current and voltages)calculated corresponding number of times because they depend on resistor R2 value.

- the resulting parameter selection form, we can change them, obtain and estimate the calculated voltage value on the resistor R2-UR2



x	V1.I	exit.V
5	-0.117	0.583
10	-0.0636	0.636
15	-0.0437	0.656
20	-0.0333	0.667
25	-0.0269	0.673
30	-0.0226	0.677
35	-0.0194	0.681
40	-0.0171	0.683
45	-0.0152	0.685
50	-0.0137	0.686

Figure 2.5: Curve and Table from Sweep simulation

- This graph showing the functional relationship between the value of R2 (which is variable) and the voltage on it - UR2. Generally it can be write as 'UR2 = f (R2)'.

- The table display the current (V1.I) flowing through the voltage source V1 and the electrical circuit point with the signal output voltage (output V) against "Ground" as a function of parameter x.

2.3 Refferences

- gschem to pcb tutorial, by Bill Wilson (release notes).

- gschem warmup, by Bill Willson.

- Mustafa Baser, "Effects of Conceptual Change and Traditional Confirmatory Simulations on Pre-Service Teachers' Understanding of Direct Current Circuits", Journal of Science Education and Technology, vol. 15, no. 5-6, Dec. 2006. Link: http://dx.doi.org/10.1007/s10956-006-9025-3.