Chapter 1

Theoretical part

1.1 Circuit calculation

For the theoretical calculation of the circuit (Laboratory Work 01, circuit diagram given in figure 1.1), I calculated the voltages on the resistors within the given circuit. My student ID is 181ADM007. According to the instructions given in the document P01_EN.pdf, the following voltage of the voltage source V_1 and resistances R_1 and R_2 were assumed:

$$V_1 = 0.07 \ V$$

$$R_1 = 1 \ \Omega$$

$$R_2 = 8 \ \Omega$$

For the voltages on the resistors, the following formulas were applied:

$$U_{R1} = \frac{R_1}{R_1 + R_2} \ V_1$$

$$U_{R2} = \frac{R_2}{R_1 + R_2} \ V_1$$

Hence, the voltages on the resistors have the following values:

$$U_{R1} = \frac{1 \ \Omega}{1 \ \Omega + 8 \ \Omega} \ 0.07 \ V = 0.00\overline{7} \ V$$

$$U_{R2} = \frac{8 \ \Omega}{1 \ \Omega + 8 \ \Omega} \ 0.07 \ V = 0.06\overline{2} \ V$$

For an overview over all values see table 1.1.
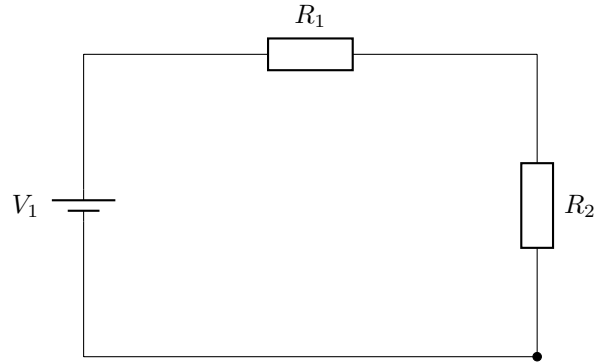
Figure 1.1: Circuit diagram

V_1	1 V
R_1	1 Ω
R_2	8 Ω
U_{R1}	$0.00\overline{7}$ V
U_{R2}	$0.06\overline{2}$ V

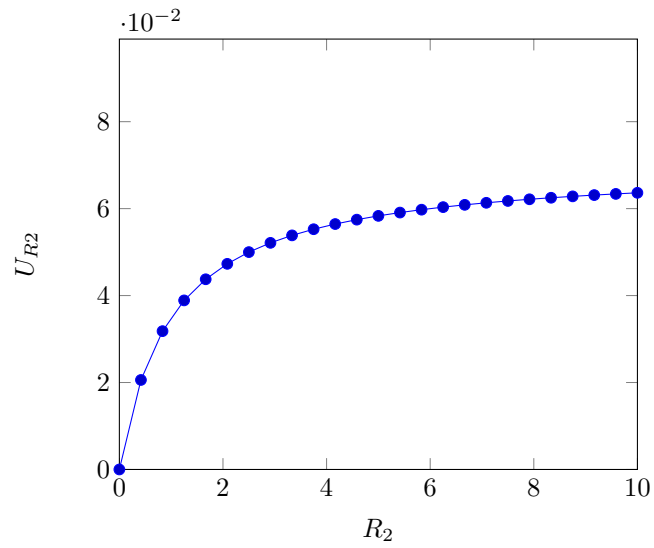Table 1.1: Values of circuit calculation

Figure 1.2: Plot of U_{R2} as function of R_2

Chapter 2

Practical part

2.1 Work with GEDA programs

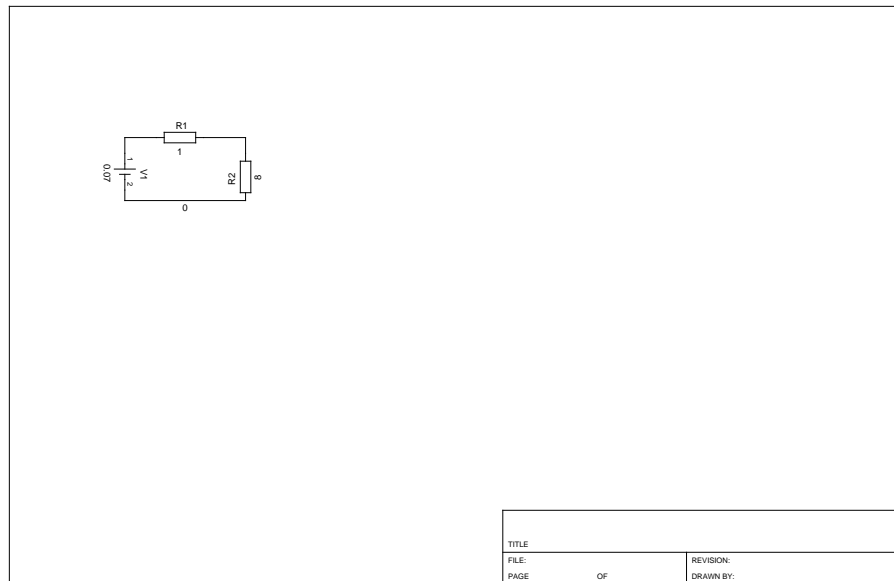### 2.1.1 Work with gschem

Figure 2.1: Image of gschem schematics

2.1.2   Work with gnetlist

```
* Spice netlister for gnetlist
R2 0 2 8
V1 1 0 0.07
R1 2 1 1
.END
```
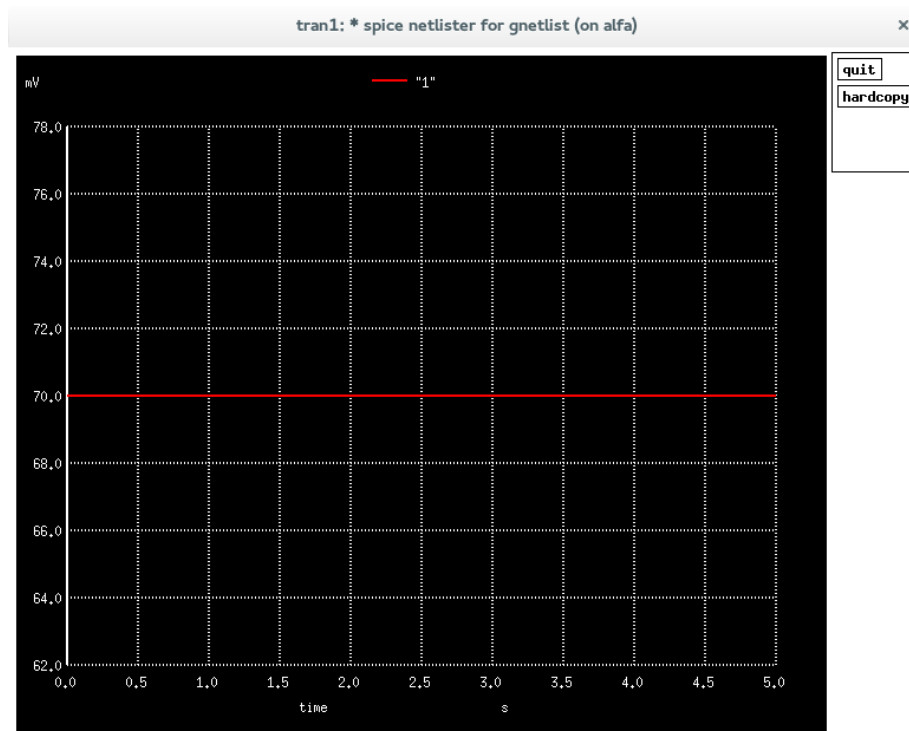
2.1.3   Work with ngspice

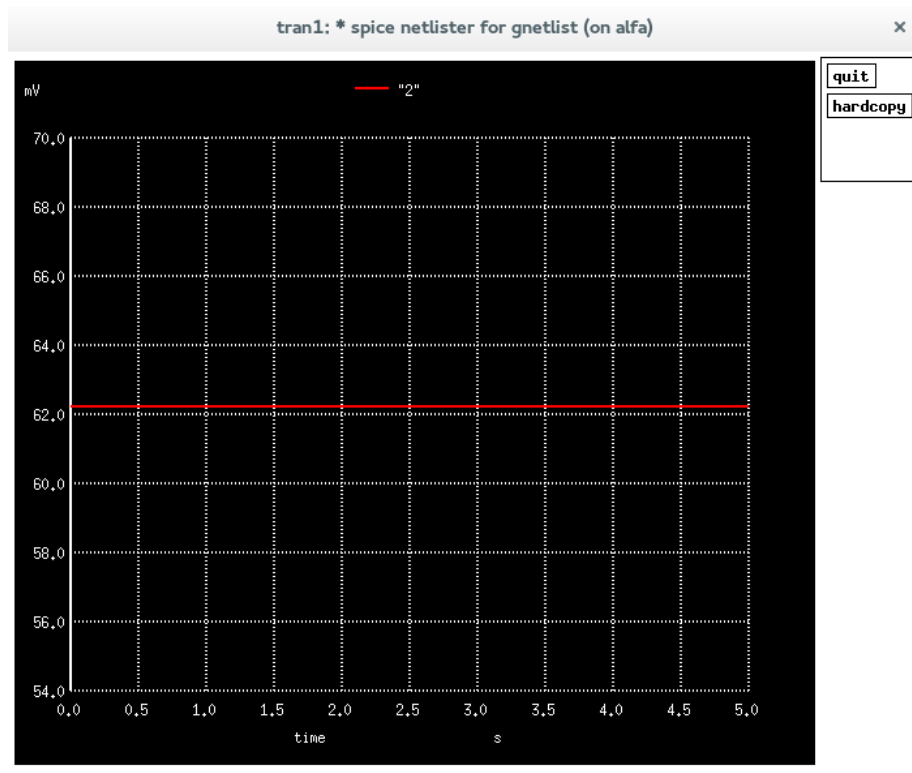Figure 2.2: Plot of R1 simulation

Figure 2.3: Plot of R2 simulation

2.2 Work with QUCS programs

For the DC simulation with QUCS, I first created the schematics of the circuit with the same properties as used for the gEDA modeling (according to the theoretical calculation in section 1.1). The QUCS schematics as well as the DC simulation plot can be found in figures 2.4 and 2.5, respectively.

2.3 Work with LATEX

This document was created on http://sharelatex.com. The laboratory works within this Computer Studies course were my first experience working with this document preparation system. I found the ShareLaTeX guide [1] to be very helpful. A book that was also recommended by many for learning to work with LATEXis The LATEXCompanion [2].
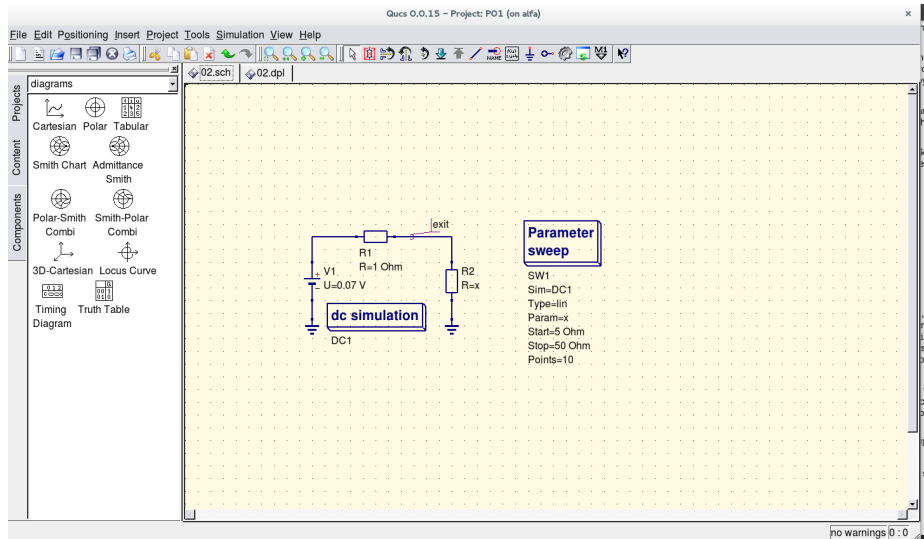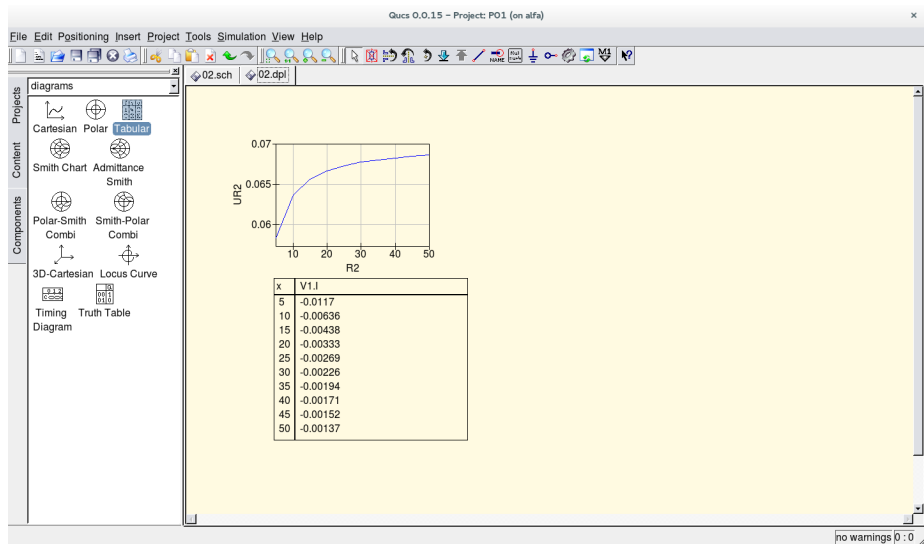
Figure 2.4: Image of QUCS schematics

Figure 2.5: Plot of DC simulation.

Bibliography

[1] Documentation. ShareLaTeX, 2018. Web. March 21st 2018.
URL: `https://www.sharelatex.com/learn`

[2] "The LaTeXCompanion, Second Edition." Frank Mittelbach and Michael Goossens. Addison-Wesley, 2004.