LAB REPORT FOR EXPERIMENT 1.1

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Title of Experiment: Experiment 1- IV characteristics of Ohm's Law (DC Input)

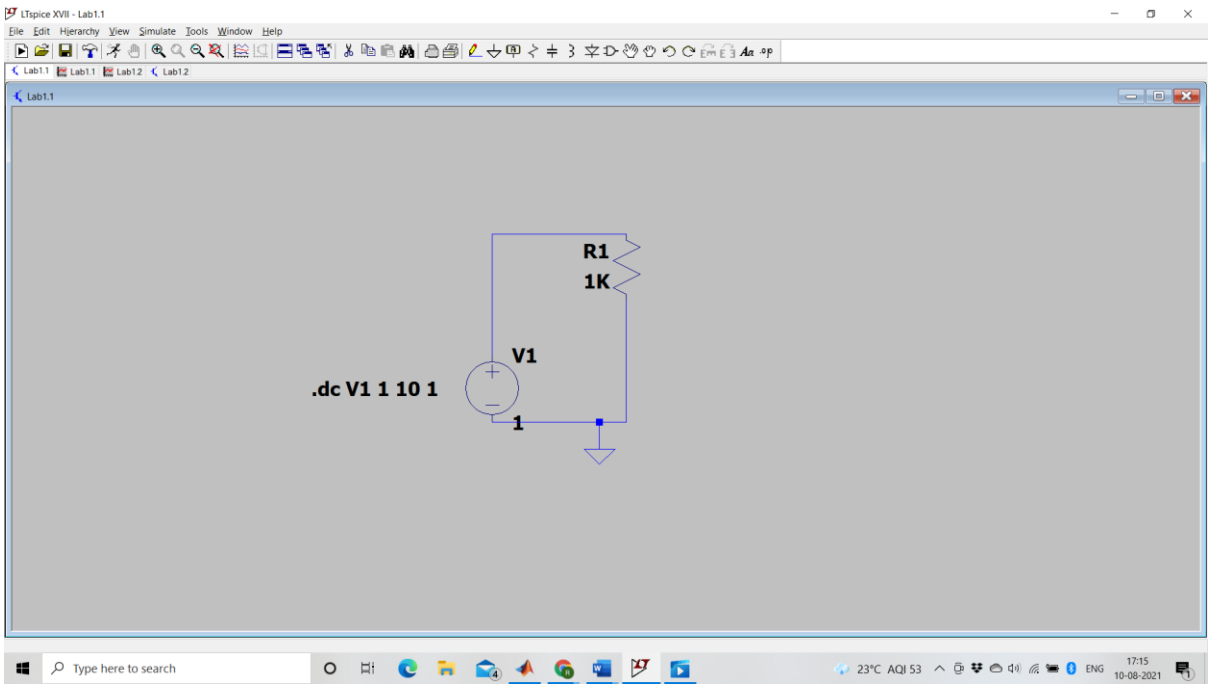
Brief Description:

This lab session involved the use of LTspice which is an analog electronic circuit simulator computer software, to perform some basic simulations namely first drawing the circuit that involved a resistor of **1K ohms resistance in series with a DC voltage source of 1V** (I also tried doing it with 12 V to note the change) in the graph. The direction of slopes obtained were noted in different plot panes. In the event that the curve corresponding to the current obtained had a negative slope, the direction of the resistor was flipped (so as to change the terminals) using Ctrl + R.

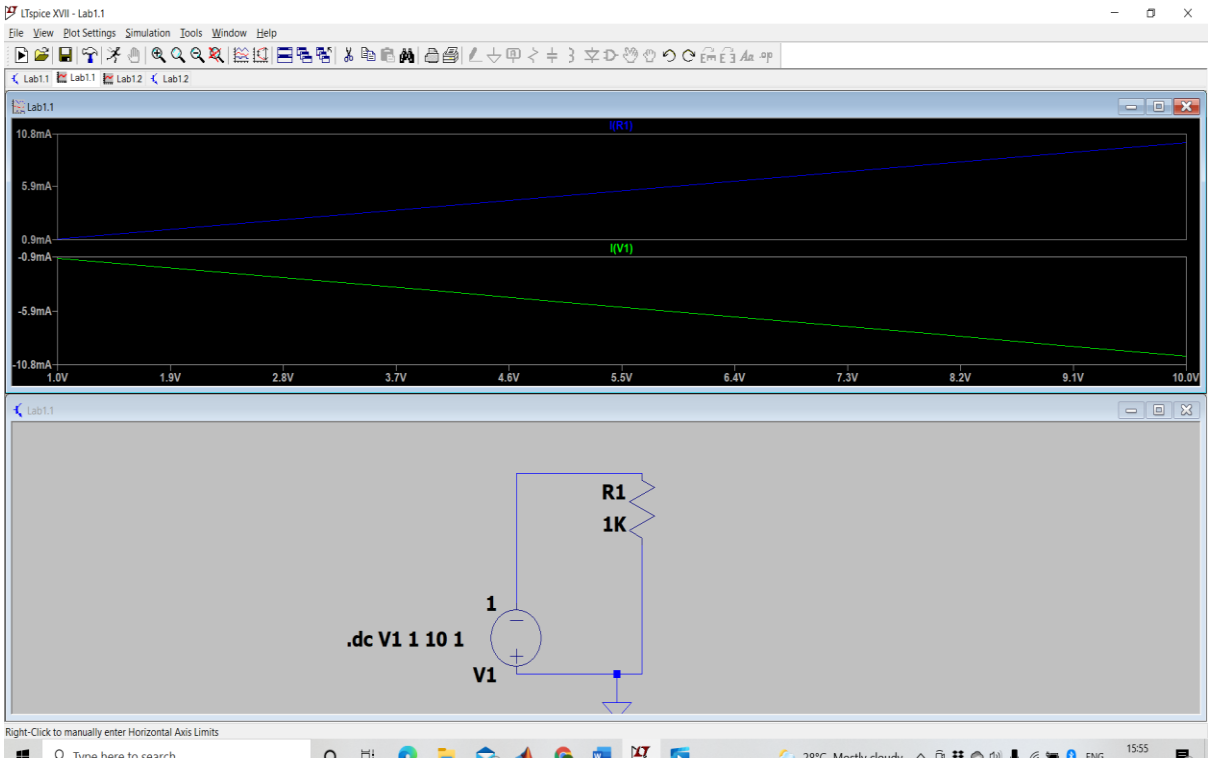
The simulation was done using a DC sweep with a start voltage of 1V, max voltage of 10V in steps of 1 and 3 (I tried out different values to test the circuit).

Schematic diagram

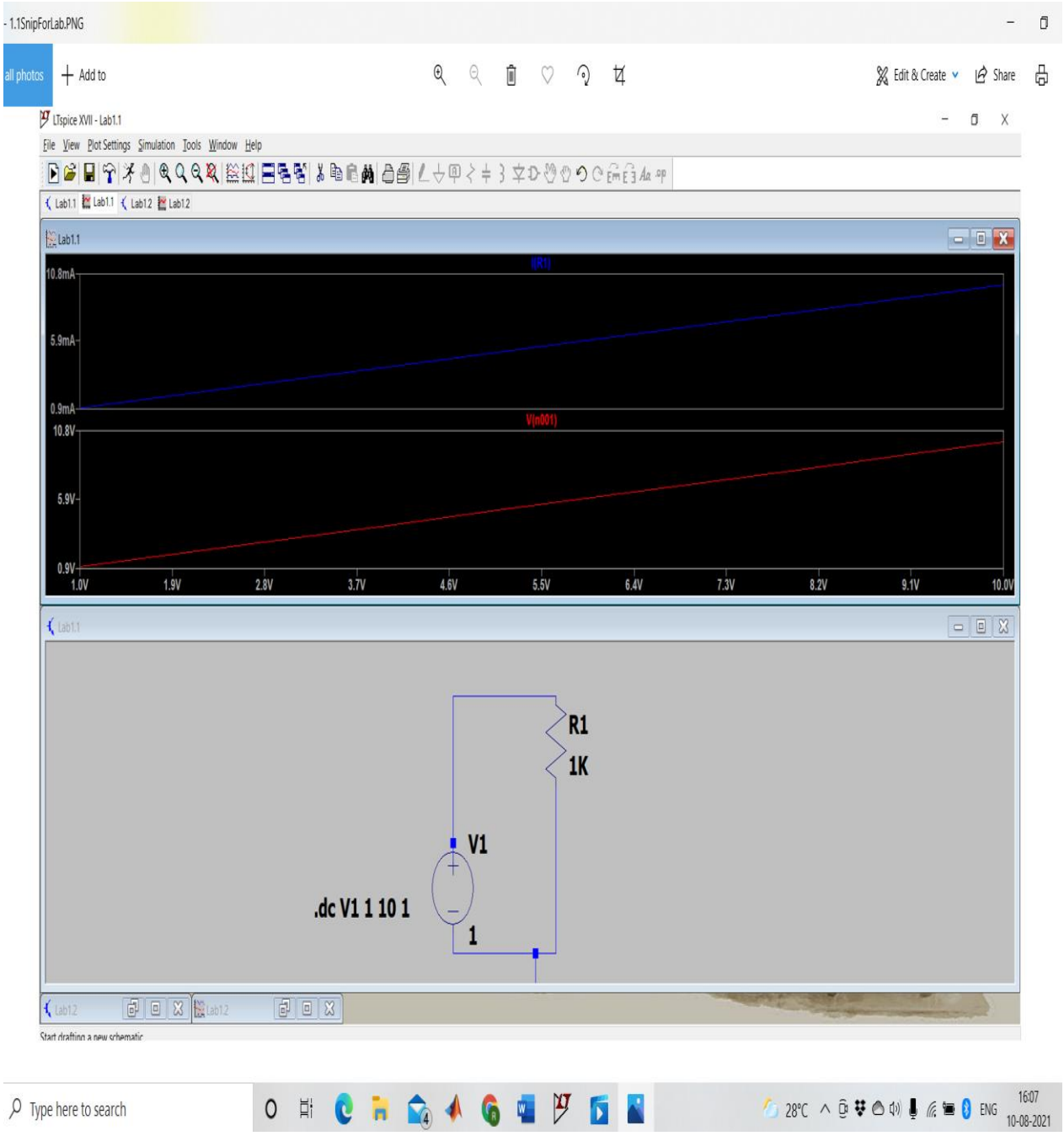
The following is a screenshot of our DC circuit



Results:



Since one of the slopes obtained above showed a negative value of current, the circuit was modified and the graph obtained was as follows :


- 1.1SnipForLab.PNG
all photos
Add to
Edit & Create
Share
LTspice XVII - Lab1.1
File View Plot Settings Simulation Tools Window Help
Lab1.1
I(R1)
10.8mA
5.9mA
0.9mA
V(n001)
10.8V
5.9V
0.9V
1.0V
1.9V
2.8V
3.7V
4.6V
5.5V
6.4V
7.3V
8.2V
9.1V
10.0V
R1
1K
V1
.dc V1 1 10 1
1
Lab1.2
Start drafting a new schematic
Type here to search
28°C
ENG
16:07
10-08-2021

Plots obtained without segregating the V and I panes :

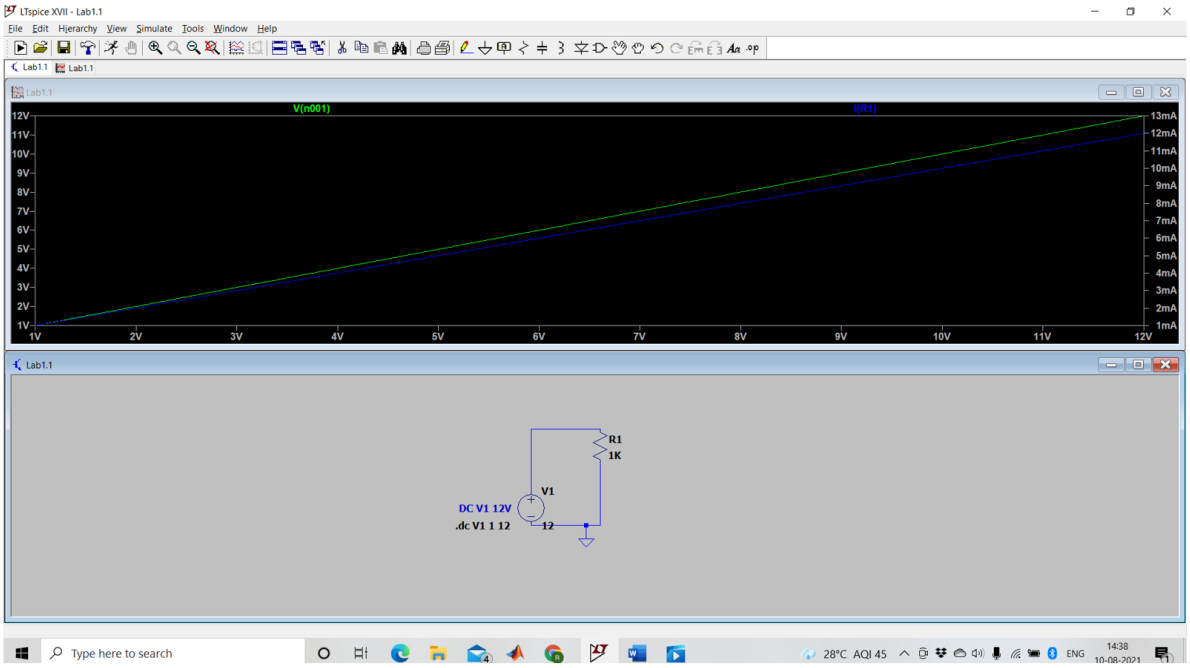


Table:

Sl.no.	Voltage (V)	Current (mA)
1	0.9	1.8
2	6.3	9.9
3	7	10
4	10.8	12
5	12	14

Discussion:

We know that Ohm's Law is extensively used to calculate the relationship between voltage, current and resistance in an electric circuit.

V = IR.

According to this law, if we consider the Resistance to be constant, we should observe that the voltage of the DC source should be directly proportional to the current.

In LTspice, the graphs that we obtained in this experiment do follow Ohm's Law.

However, in reality, due to the following factors, Ohm's law curves might show certain deviations:

- Dissipation of heat (due to excess heating of one or more components)
- Thermal resistivity of the connecting wires
- Least count or human errors while taking readings owing to improper device calibration.