Lab 5 Prelab

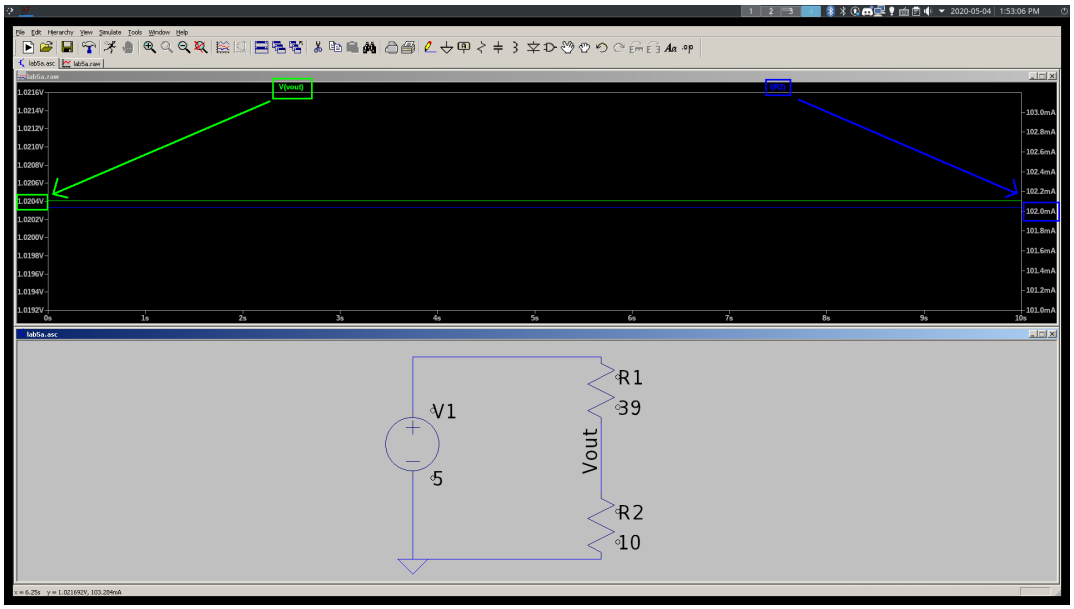
Astrid Yu

May 5, 2020

1. The selected resistances were $R1 = 39\Omega, R2 = 10\Omega$.

   The SPICE output is $V_{R2} = 1.0204\,\text{V}, I_{R2} = 102.0\,\text{mA}$.

   The delivered power is $V_{R2} \cdot I_{R2} = 104.1\,\text{mW}$.



2.

$$
\begin{aligned}
V &= \frac{R}{R + 2k\Omega} \cdot 5\,\mathrm{V} \\
V \cdot R + V \cdot 2k\Omega &= R \cdot 5\,\mathrm{V} \\
V \cdot 2k\Omega &= 5\,\mathrm{V} \cdot R - V \cdot R \\
V \cdot 2k\Omega &= (5\,\mathrm{V} - V) \cdot R \\
\frac{V \cdot 2k\Omega}{5\,\mathrm{V} - V} &= R
\end{aligned}
\tag{1}
$$

3.

$$
V = \frac{5\,\mathrm{V}}{2^{10}} \cdot X \tag{2}
$$

4. Let T be the ambient temperature and R be the resistance of the thermistor. Their relationship was found to be

$$
T = (0.1056 \frac{^\circ\mathrm{F}}{\Omega}) \cdot R - 146.4^\circ\,\mathrm{F} \tag{3}
$$