Lab 2 Simple DC Circuits

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Table 1: Voltage vs. Current for R_1

	1	2	3	4	5	6
Voltage (V)	1.12	2.02	2.99	3.95	5.07	6.09
Current (I)	0.056	0.103	0.148	0.198	0.250	0.308

$$R_1 = \boxed{19.97 \pm 0.25\Omega} \tag{1}$$

Table 2: Voltage vs. Current for R_2

	1	2	3	4	5	6
Voltage (V)	1.06	1.89	3.12	3.97	4.88	5.90
Current (I)	0.043	0.079	0.132	0.165	0.200	0.249

$$R_2 = \boxed{24.06 \pm 0.4\Omega} \tag{2}$$

Table 3: Voltage vs. Current for R_1 and R_2 in series

	1	2	3	4	5	6
Voltage (V)	0.91	2.09	3.08	3.98	5.01	5.97
Current (I)	0.021	0.048	0.071	0.091	0.114	0.133

$$\begin{aligned} R_S &= R_1 + R_2 \\ &= \boxed{44.03 \pm 0.65\Omega} \end{aligned} \tag{3}$$

Table 4: Voltage vs. Current for R_1 and R_2 in parallel

	1	2	3	4	5	6
Voltage (V)	0.93	2.12	3.10	4.10	5.11	5.99
Current (I)	0.0841	0.1930	0.2880	0.3800	0.4740	0.5540

$$\begin{aligned} R_P &= \frac{R_1 * R_2}{R_1 + R_2} \\ &= \boxed{10.91 \pm 0.15\Omega} \end{aligned} \tag{4}$$

1. Consider the diagram of the experiment Fig. 2.2 and the real life situation. Are your calculated values for the unknown resistances slightly larger or slightly smaller than the actual unknown resistance? Explain.

    - The calculated values are slightly larger because resistance is directly proportional to the temperature and increased temperature will led to increase in resistance.

2. We have tried to keep the currents low in this experiment, what are the various things that could occur if the current is allowed to be larger?

    - By using low current, we can avoid larger increase in resistance of wire.