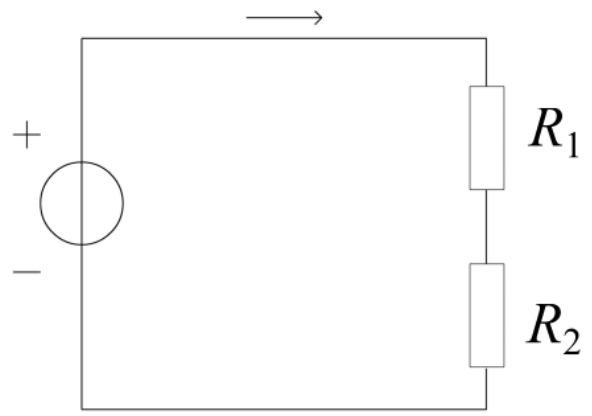
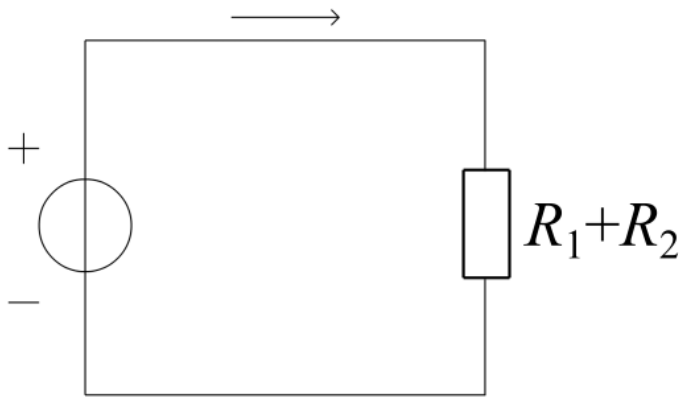
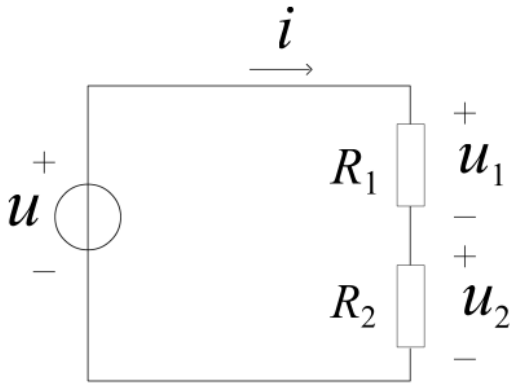
2-2 电阻的串联和并联





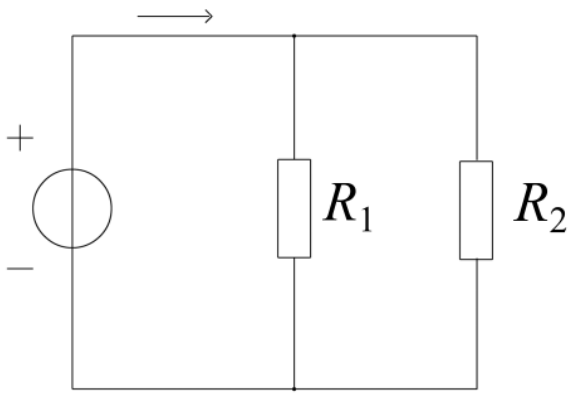


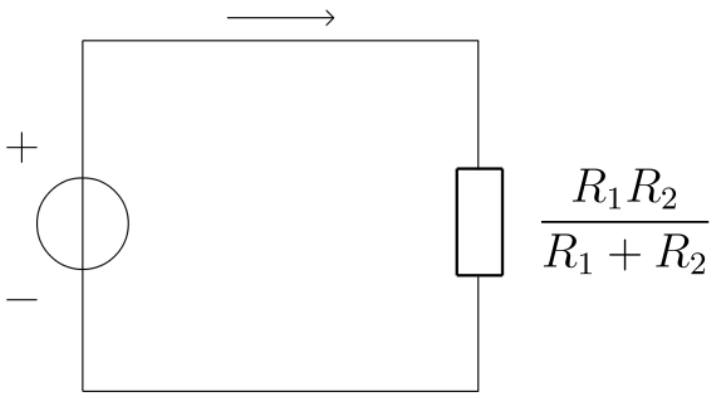
$$u_1 = R_1 i \qquad u_2 = R_2 i$$

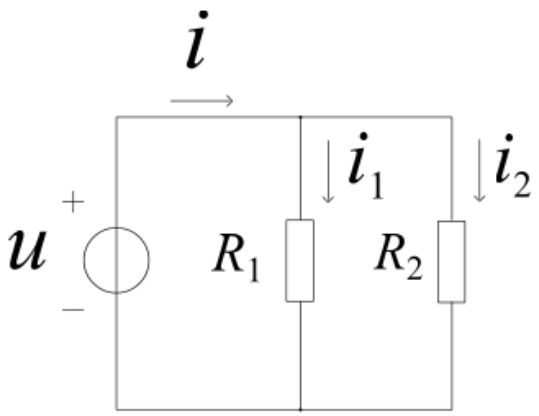
$$R_{\text{eq}} = R_1 + R_2$$

$$u = u_1 + u_2 = R_1 i + R_2 i = (R_1 + R_2)\, i \qquad u = R_{\text{eq}} i$$

n个电阻串联，可以等效为一个电阻 $R_{\text{eq}} = R_1 + R_2 + R_3 + \cdots + R_{\text{n}}$







电导是电阻的倒数 $G=\dfrac{1}{R}$

$$u=Ri \quad \Rightarrow \quad i=Gu$$

$$i_1=\frac{u}{R_1}=G_1u \qquad i_2=\frac{u}{R_2}=G_2u$$

$$i=i_1+i_2=\frac{u}{R_1}+\frac{u}{R_2}=G_1u+G_2u=(G_1+G_2)\,u$$

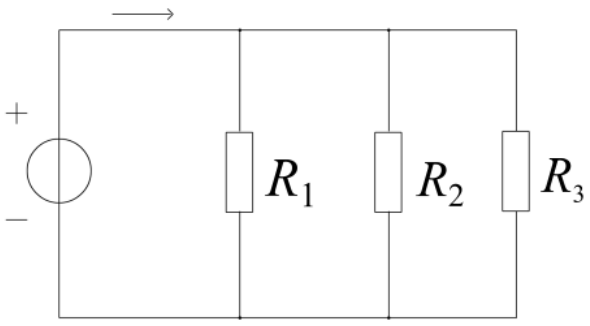
$$i=G_{\mathrm{eq}}u \quad \Leftarrow \quad G_{\mathrm{eq}}=G_1+G_2$$

$$R_{\mathrm{eq}}=\frac{1}{G_{\mathrm{eq}}}=\frac{1}{G_1+G_2}=\frac{1}{\frac{1}{R_1}+\frac{1}{R_2}}=\frac{R_1R_2}{R_1+R_2}$$

n个电阻并联，可等效为一个电阻

$$R_{\mathrm{eq}}=\frac{1}{G_{\mathrm{eq}}}$$

$$G_{\mathrm{eq}}=G_1+G_2+G_3+\cdots+G_{\mathrm{n}}$$



$$R_{\mathrm{eq}}=\frac{1}{G_{\mathrm{eq}}}=\frac{1}{G_1+G_2+G_3}=\frac{1}{\frac{1}{R_1}+\frac{1}{R_2}+\frac{1}{R_3}}$$