Calculations

The output voltage V_{out} is given by:

$$V_{out} = V_{in} \times \frac{R2}{R1 + R2}$$

Where:

- $V_{in} = 6V$ (voltage from the relay's COM port)
- $R1 = 12k\Omega$
- $R2 = 10k\Omega$

Substituting Values:

1. Calculate the total resistance:

$$R_{total} = R1 + R2 = 12k\Omega + 10k\Omega = 22k\Omega$$

2. Calculate the ratio:

$$\frac{R2}{R1 + R2} = \frac{10k\Omega}{22k\Omega} = 0.455$$

3. Calculate V_{out}:

$$V_{out} = V_{in} \times \frac{R2}{R1 + R2}$$

$$V_{out} = 6V \times 0.455 = 2.73V$$

The current flowing through the voltage divider is the same for $R1$ and $R2$, calculated using Ohm's Law:

$$I = \frac{V_{in}}{R1 + R2}$$

Substituting Values:

$$I = \frac{6V}{22k\Omega}$$

$$I = 0.273mA$$

Wiring

```
Relay COM (6V)
     |
     R1 (12kΩ)
     |
     +------> GPIO Pin --->|----> Arduino 3.3V
     |                      Diode
     R2 (10kΩ)
     |
    GND
```