python_basics

February 25, 2022

Discharge time of a capacitor is 5τ.

$$\tau = RC \tag{1}$$

There are a range of capacitor values, and resistor values that are practical to deal with. We will start with capacitor values, and calculate resistor values based upon them.

Capacitor Values	
1pF	10,000µF

Target dischange time is 0.5s

```
C Raw: 1.0000000000000001e-07F
Capacitance: 100.00000000000001pF
Resistance: 1.0MΩ
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Current Max for the Raspbeery Pi GPIO is 16mA, and the voltage is 3.3V

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Resistance for 8mA @ 3.3V: 206.24999999999997
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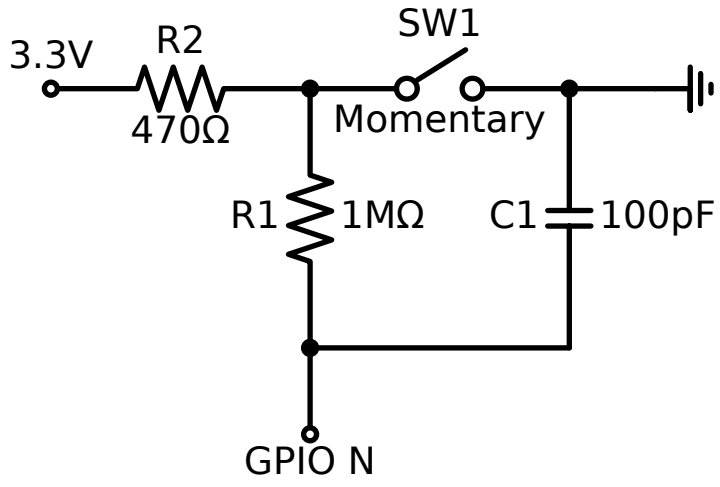
$$R = \frac{V}{I} = \frac{3.3V}{0.008A} = 206.3\Omega \tag{2}$$

$$I = \frac{V_{Pi} - V_{LED}}{R} = \frac{3.3V - 1.7V}{200\Omega} = 0.008A = 8mA \tag{3}$$

0.0.1 Resource Link: A kit that has all components plus more.

https://www.amazon.com/OSOYOO-Electronic-Components-Package-Total/dp/B01MZ87USD/ref=sr_1_1_sspa?crid=C04U73GCKIY4&keywords=capacitor+kit&qid=1645608193&1-spons&psc=1&spLa=ZW5jcnlwdGVkUXVhbGlmaWVyPUEyMDVMUEpYWDYyWVYwJmVuY3J5cHRlZElk

Debounced with τ of 0.1S



Debounced with τ of 0.1S