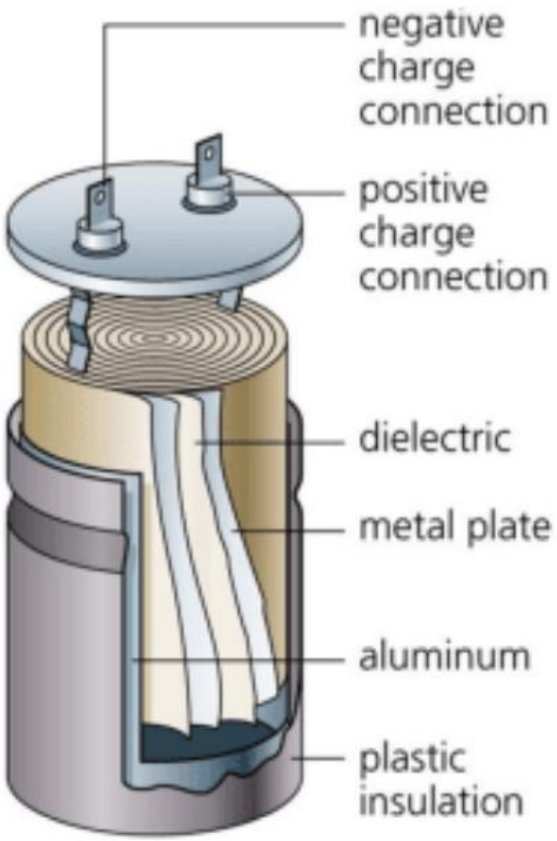
Capacitors, Buzzer and Comparator

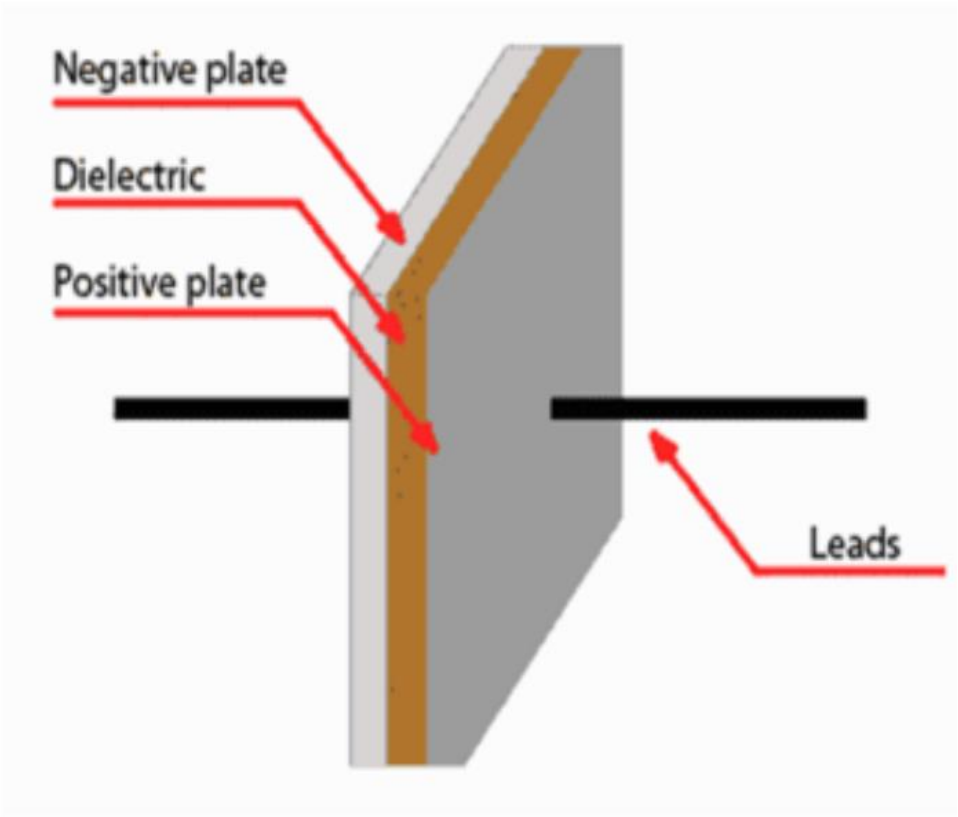
Instructed By: Mr. Supun Dissanayaka

Bhavat Ngamdeevilaisak

Capacitor

Capacitor: How it is made…



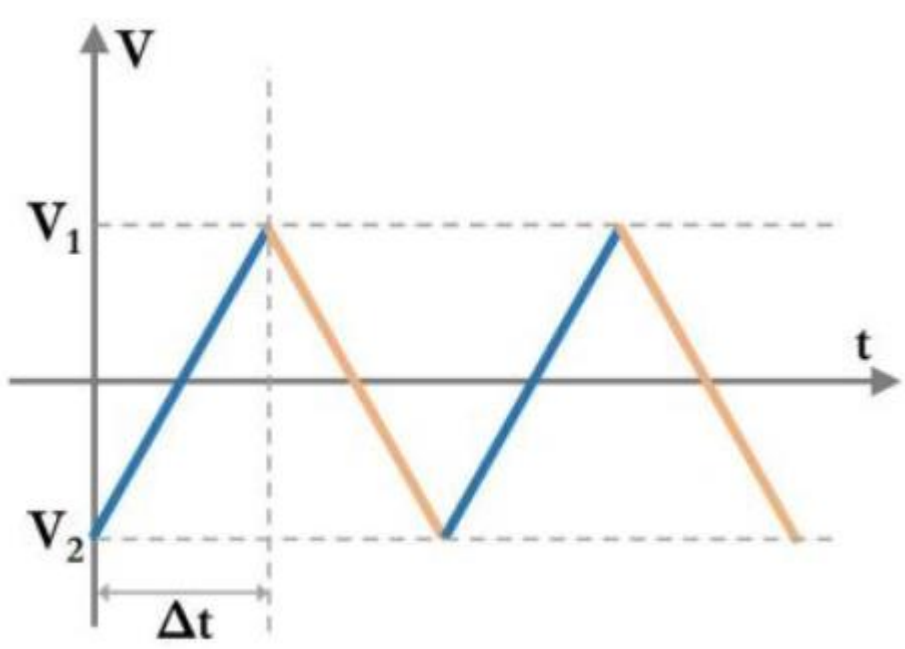


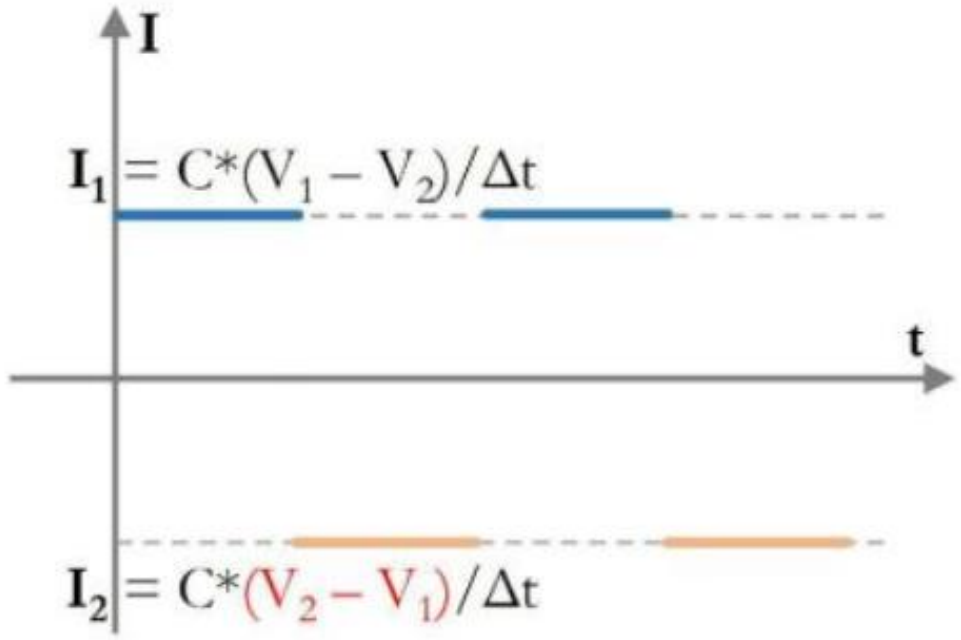
The structure of a real capacitor

Capacitor: Current & Voltage behavior

$$Q = CV$$

$$I = C\frac{dv}{dt}$$

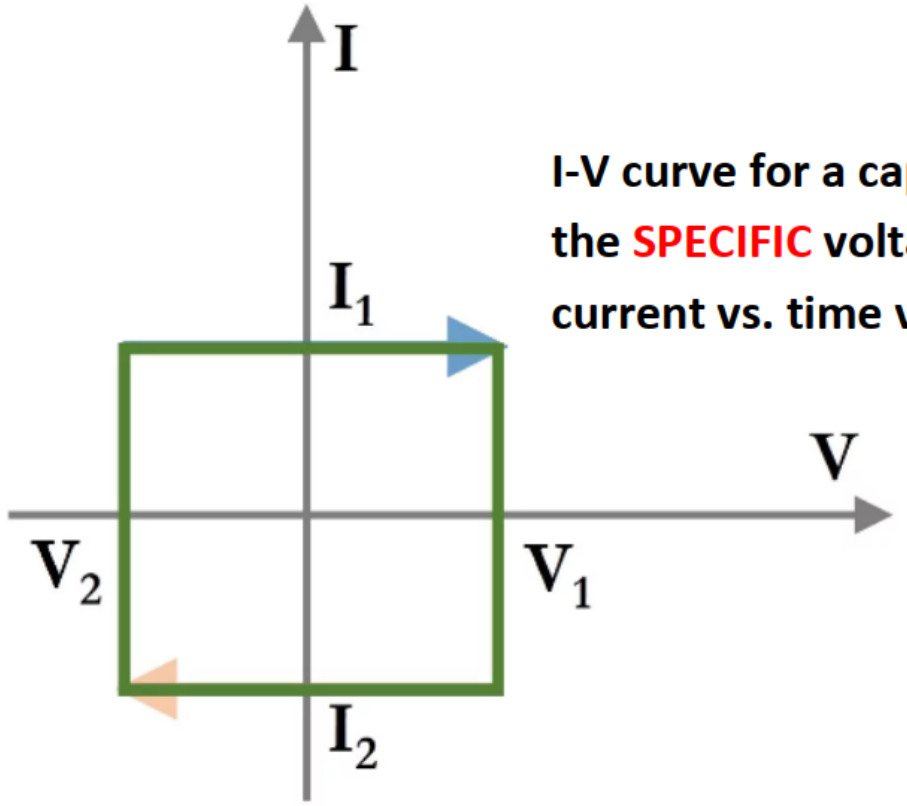




Capacitor: Current & Voltage behavior

$$Q = CV$$

$$I = C\frac{dv}{dt}$$

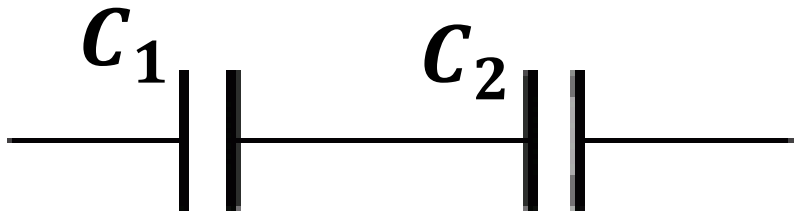


I-V curve for a capacitor exhibiting the SPECIFIC voltage vs. time and current vs. time variations

Capacitor: Series and Parallel

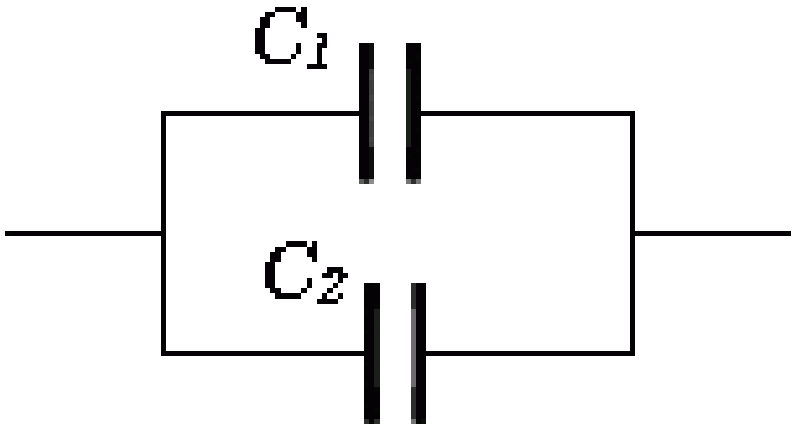
$$C_{eq} = \frac{1}{\frac{1}{C_1} + \frac{1}{C_2}}$$

Series circuit

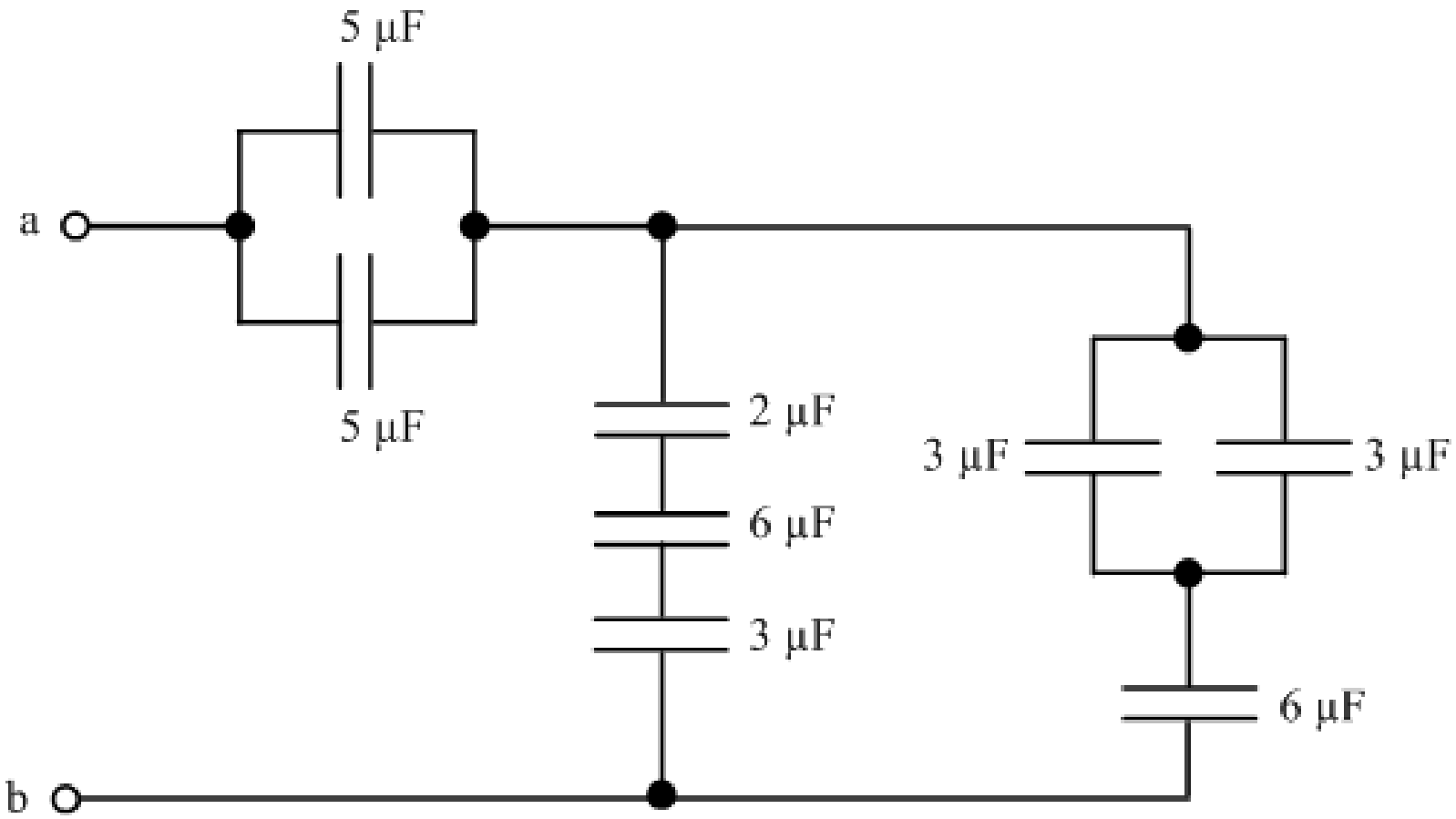


$$C_{eq} = C_1 + C_2$$

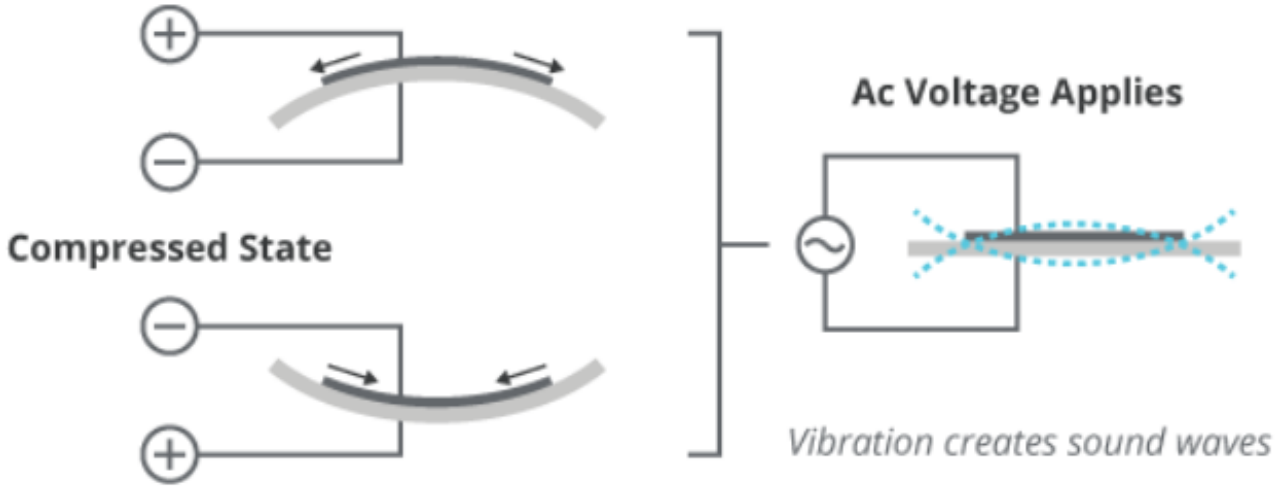
Parallel circuit



Capacitor: Series and Parallel

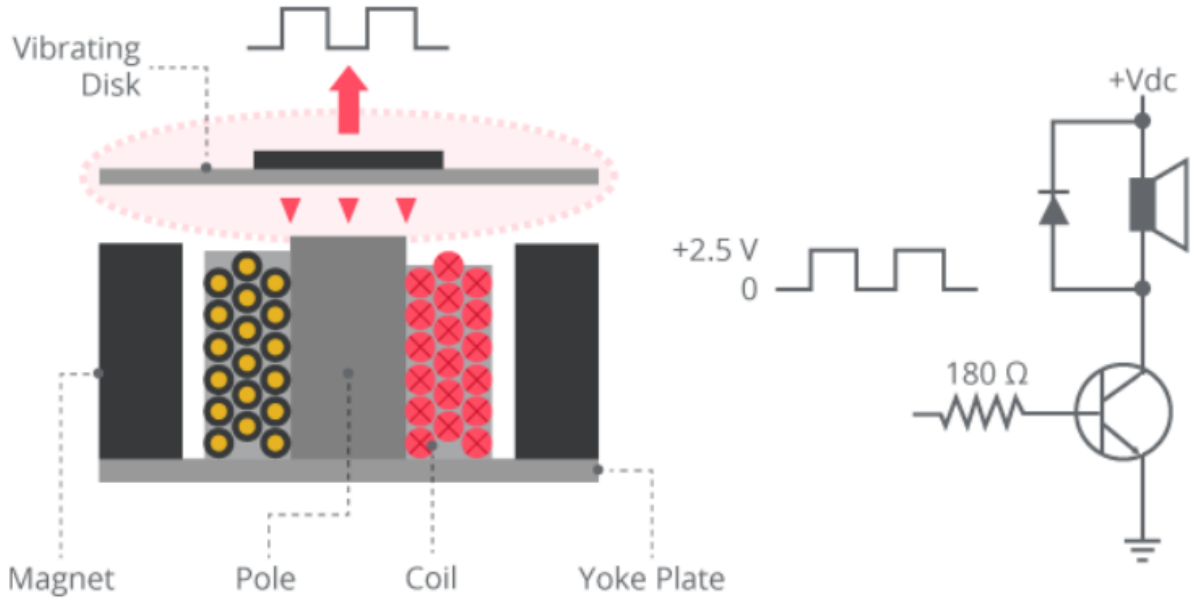


Buzzers



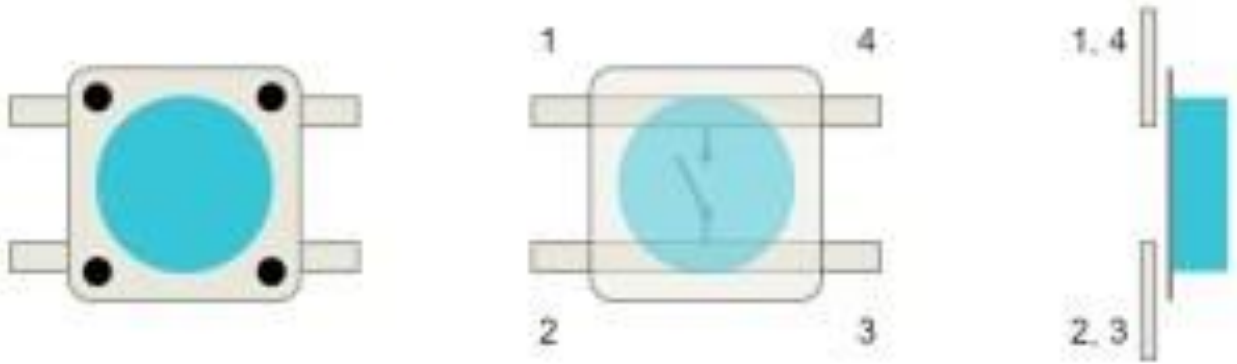
Piezo buzzer

Buzzers (Contd.)



Magnetic buzzer

Push buttons



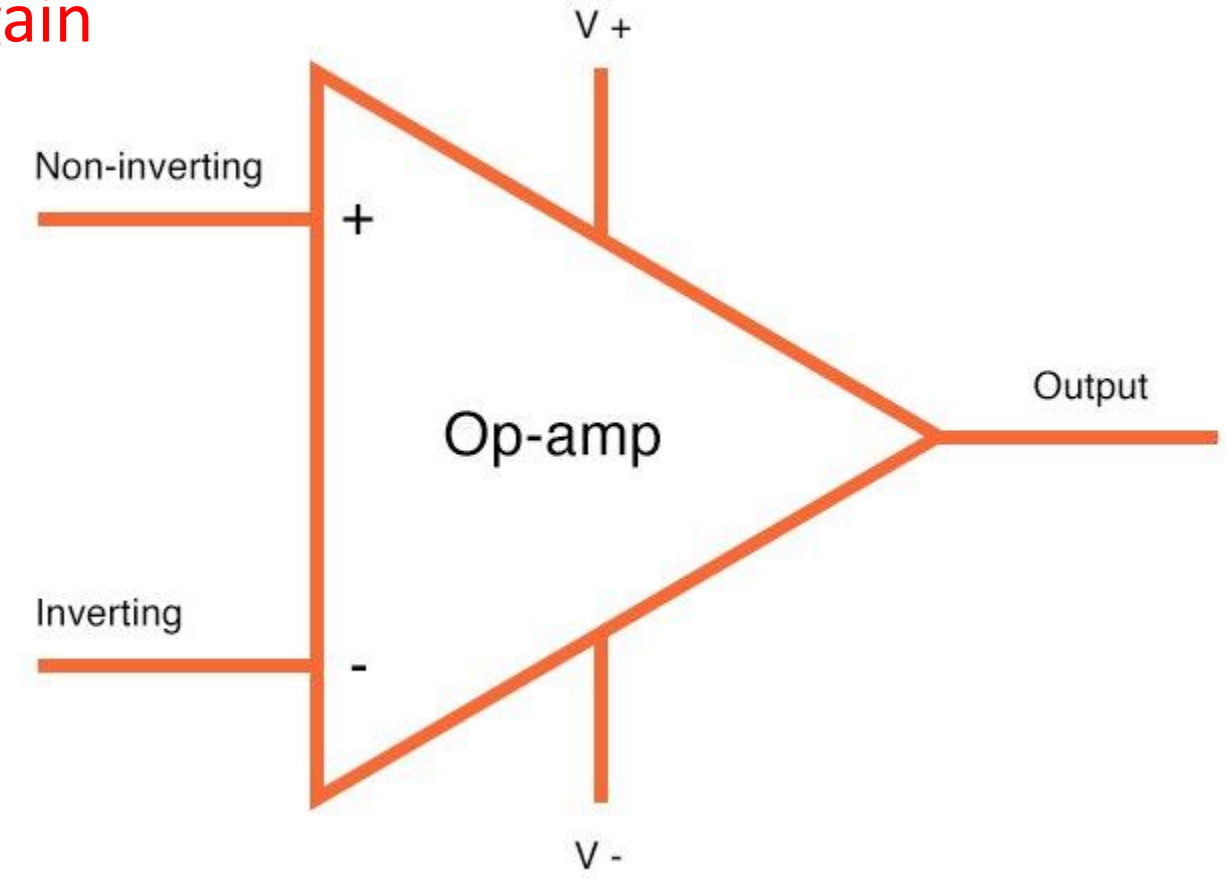
Push button

Rules of Op-Amp

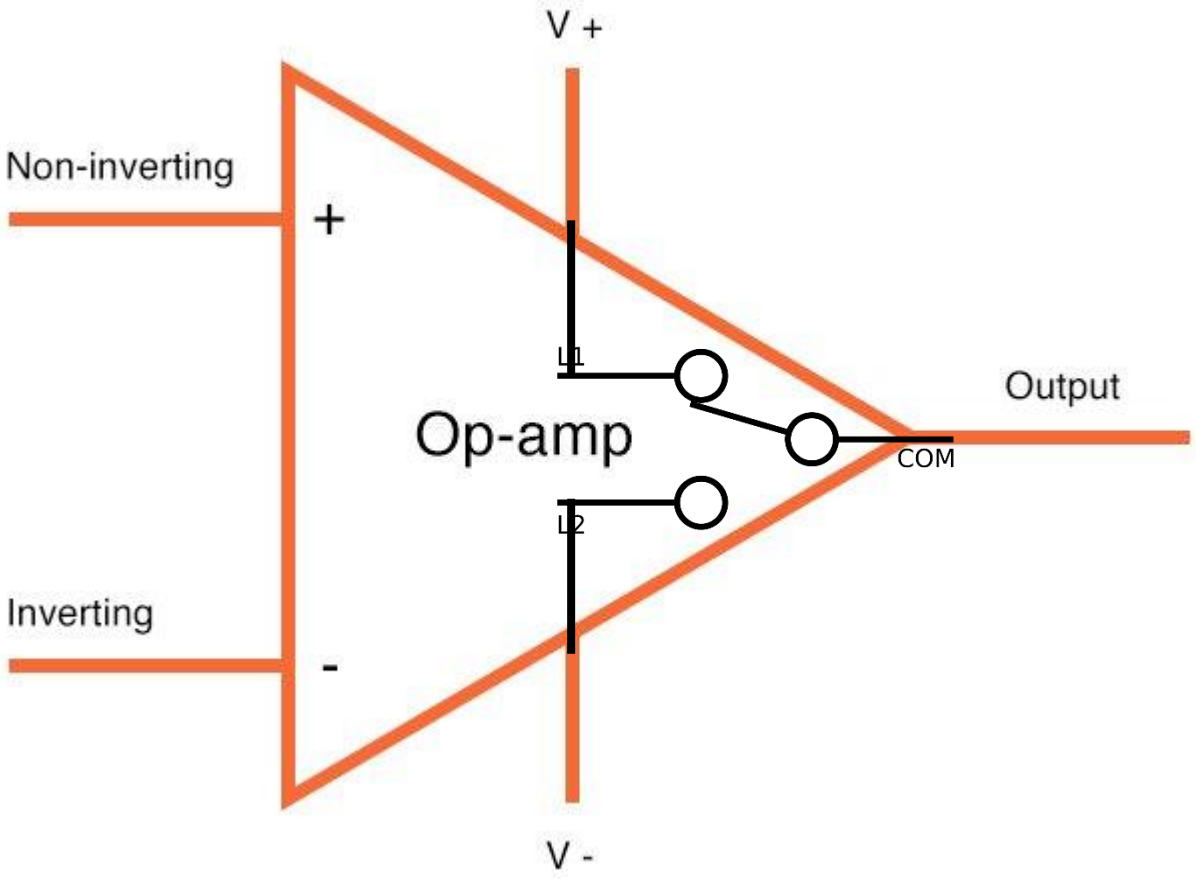
1. The Op-Amp will try to keep the same voltage on both inputs
2. No current can be flow in or out of the inputs of the Op-Amp.

Vout = (Non inverting - inverting) * gain

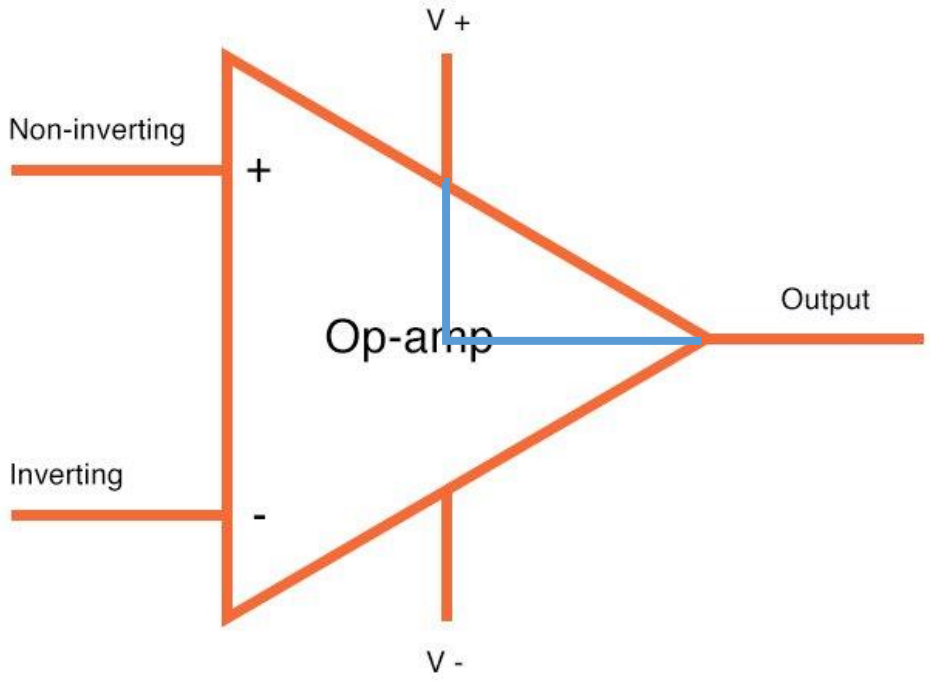
Using Op-Amp as a comparator

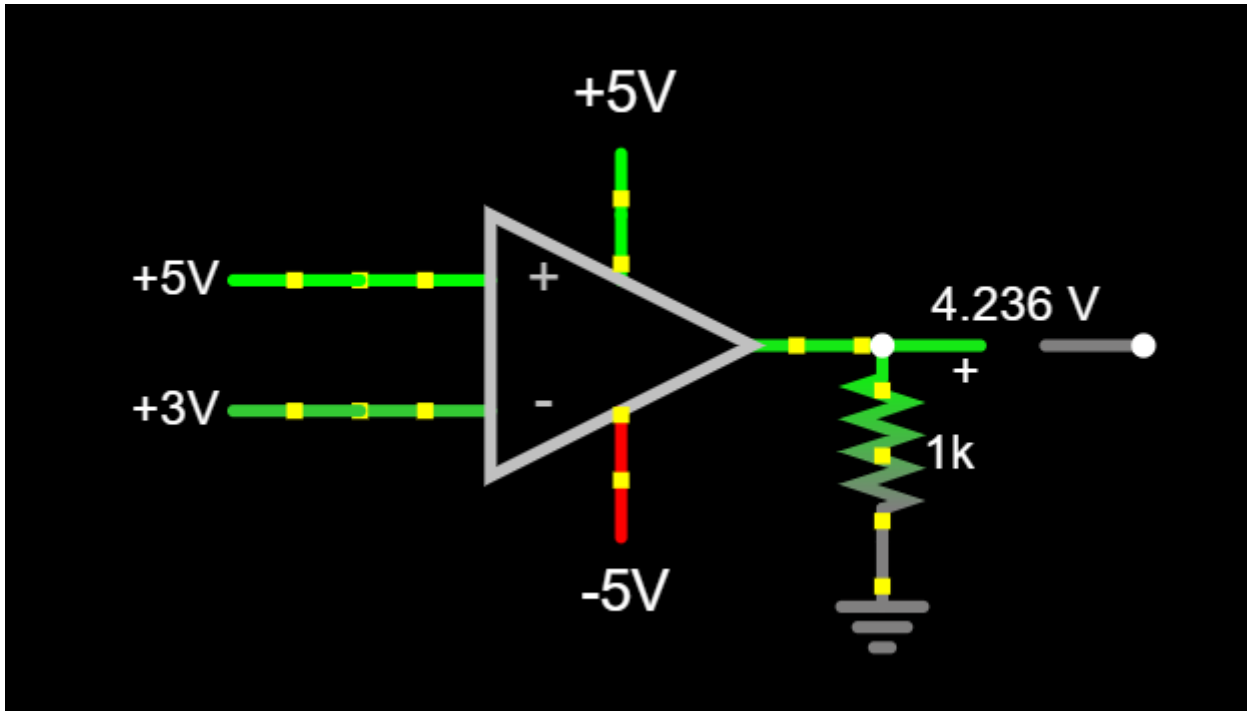


You can think of it likes a switch that switch the output to V+ or V- depending on the input condition

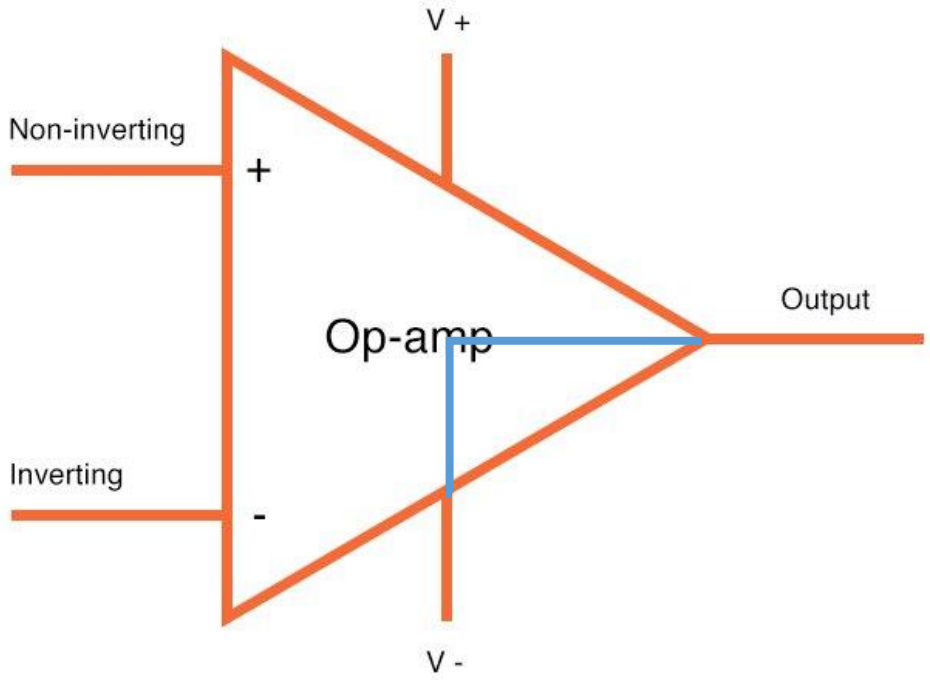


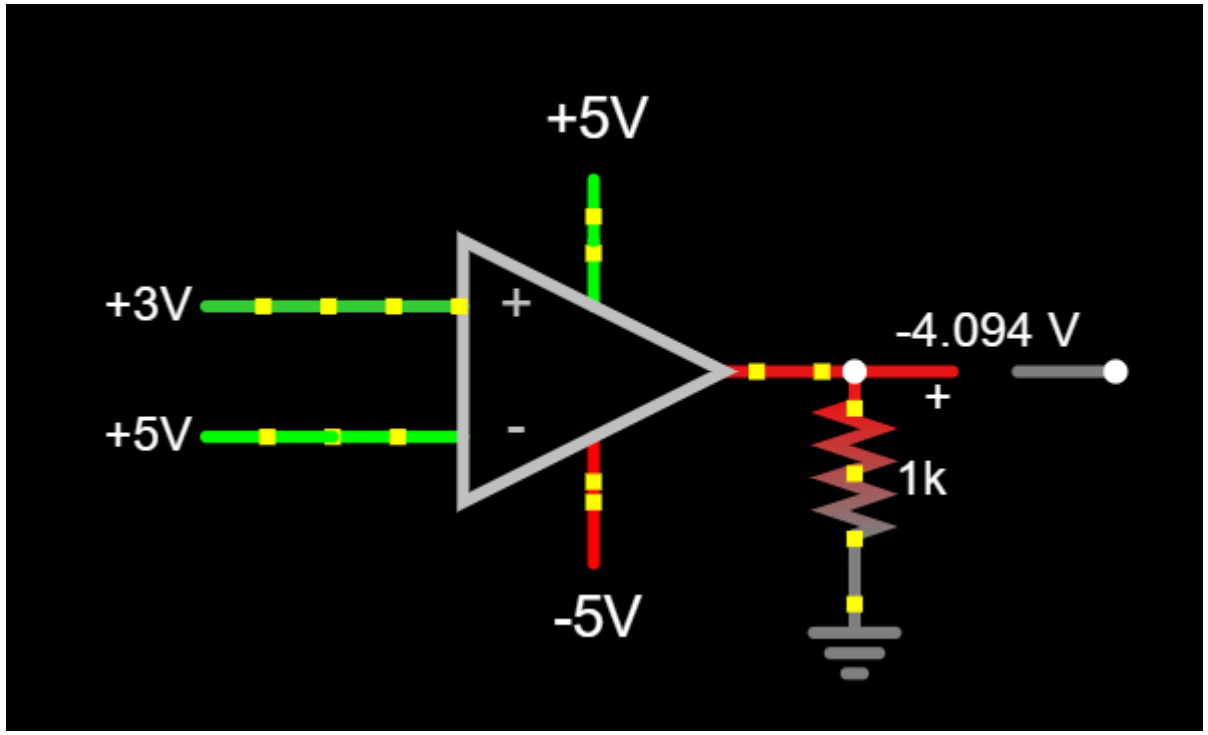
If V at non-inverting input is **greater** than inverting input output will be connected to **V+**





If V at non-inverting input is **less** than inverting input output will be connected to **V-**





Thanks for listening…