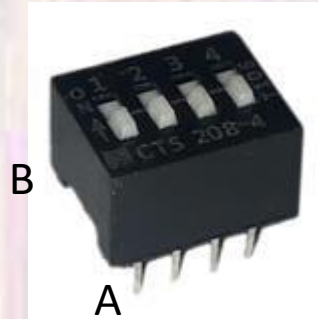


# Switch Basics

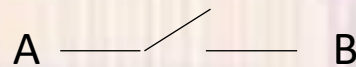
Last updated 8/16/21

# Switch Basics

- 4 switch block
  - 4 switches in 1 housing



- Switch low – open circuit between the pins

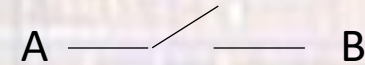


- Switch high (on) – short circuit between the pins

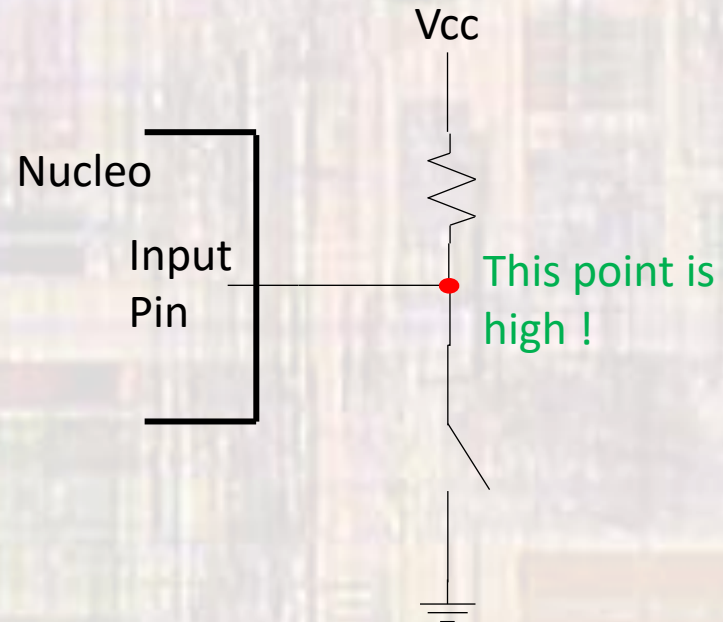
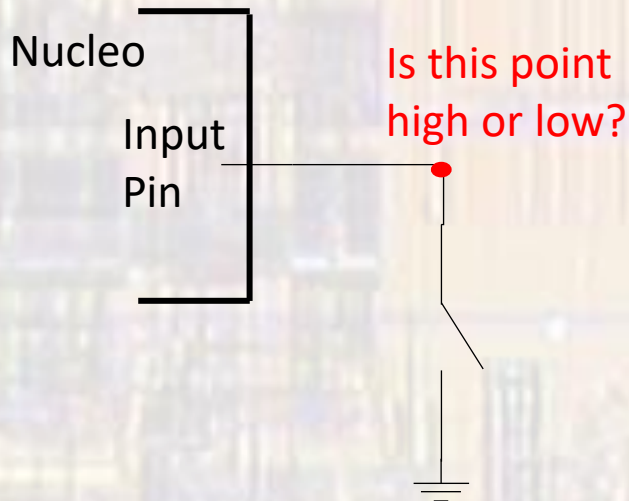


# Switch Basics

- 1 switch in 4 switch block – switch low  $\rightarrow$  open



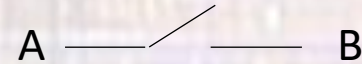
- Need some kind of resistor in our design to ensure we know what state the input pin is in



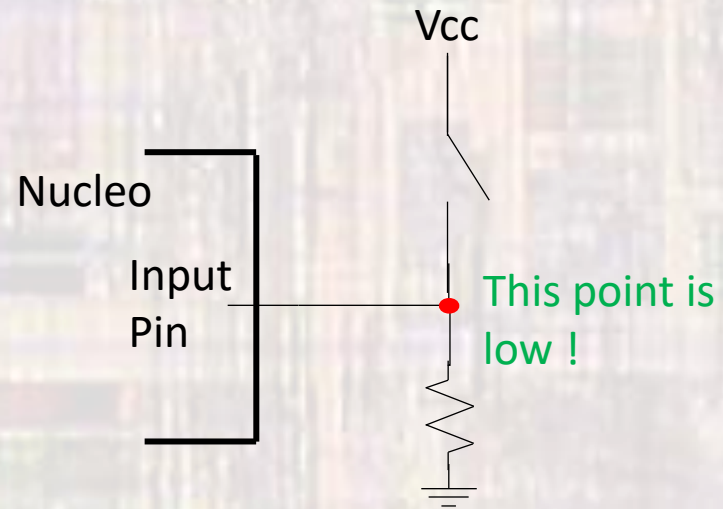
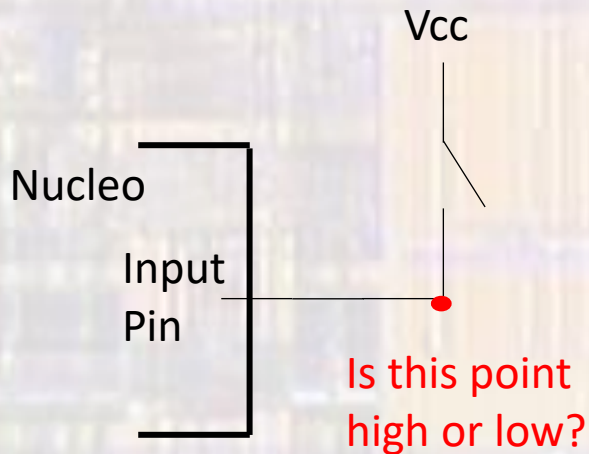
Switch low (open) – input pulled high  
Switch high (on) – input pulled low

# Switch Basics

- 1 switch in 4 switch block – switch low  $\rightarrow$  open



- Need some kind of resistor in our design to ensure we know what state the input pin is in



Switch low (open) – input pulled low  
Switch high (on) – input pulled high

# Switch Basics

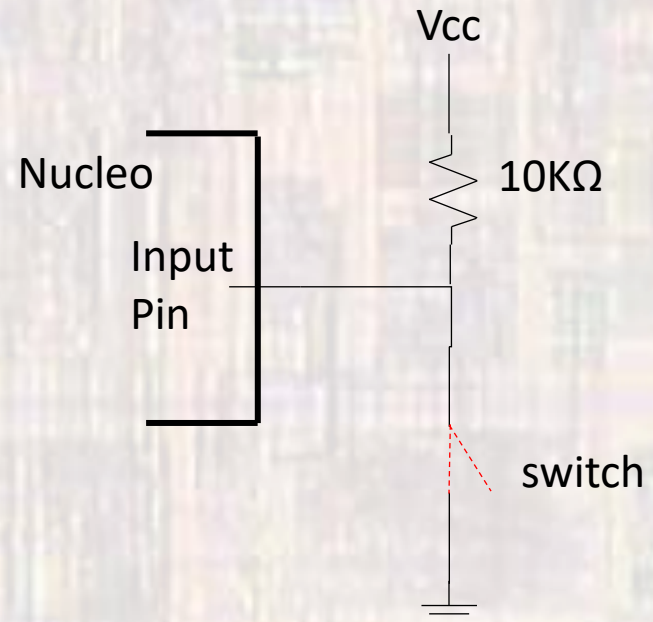
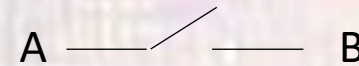
- 1 switch in 4 switch block

- What resistor value?
  - Too small → wasted current (power)
  - Typically several KΩ

- Example

- 10KΩ
- Switch open → no current (pin high)
- Switch closed →

$$\begin{aligned} (V_{cc} - Gnd) / 10,000\Omega &= \\ 3.3V / 10,000\Omega &= 330\mu A \\ \text{(pin low)} & \end{aligned}$$



Switch low (open) – input pulled high  
Switch high (on) – input pulled low