

Sensors, Microcontrollers and Actuators

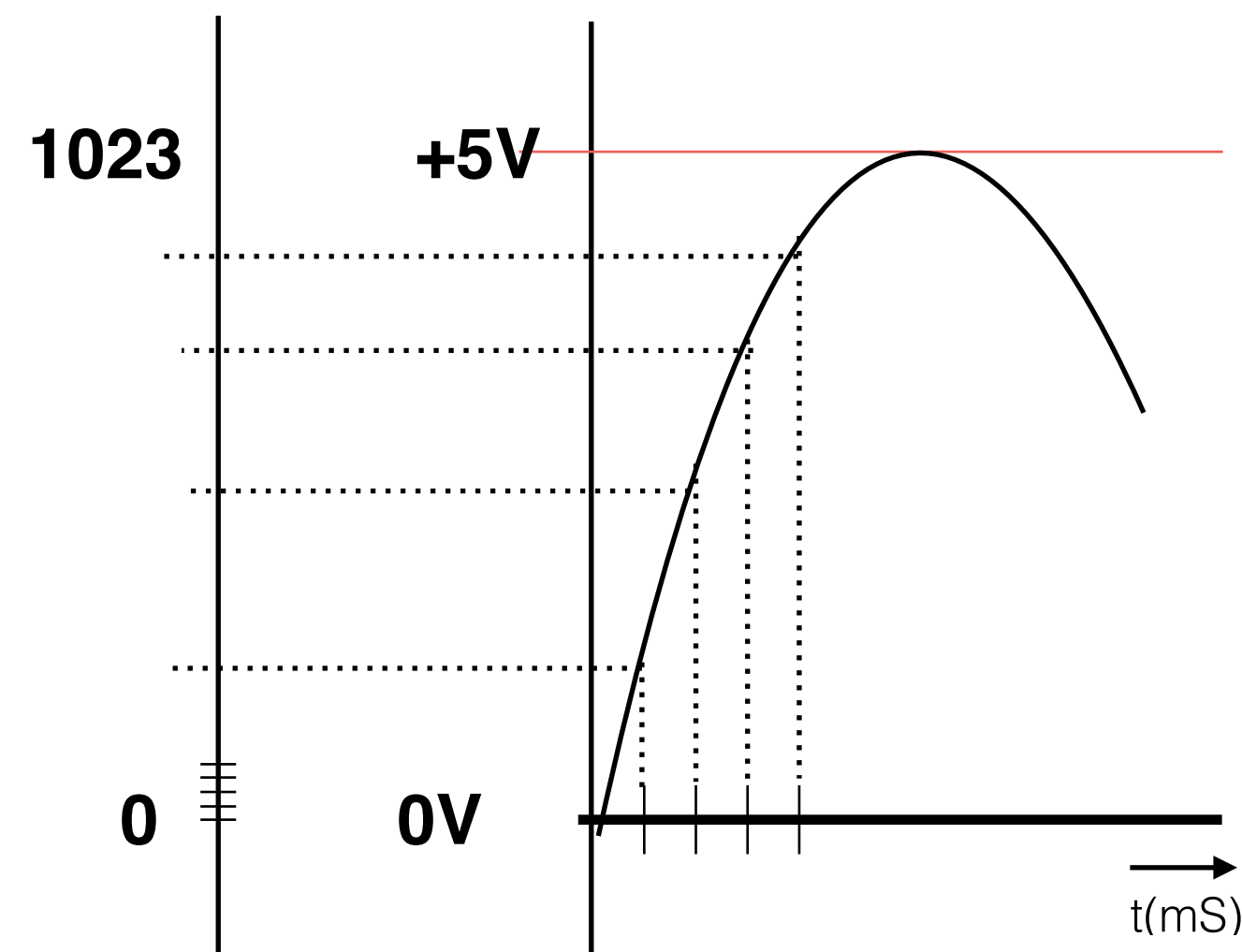
Sensor input

INPUT

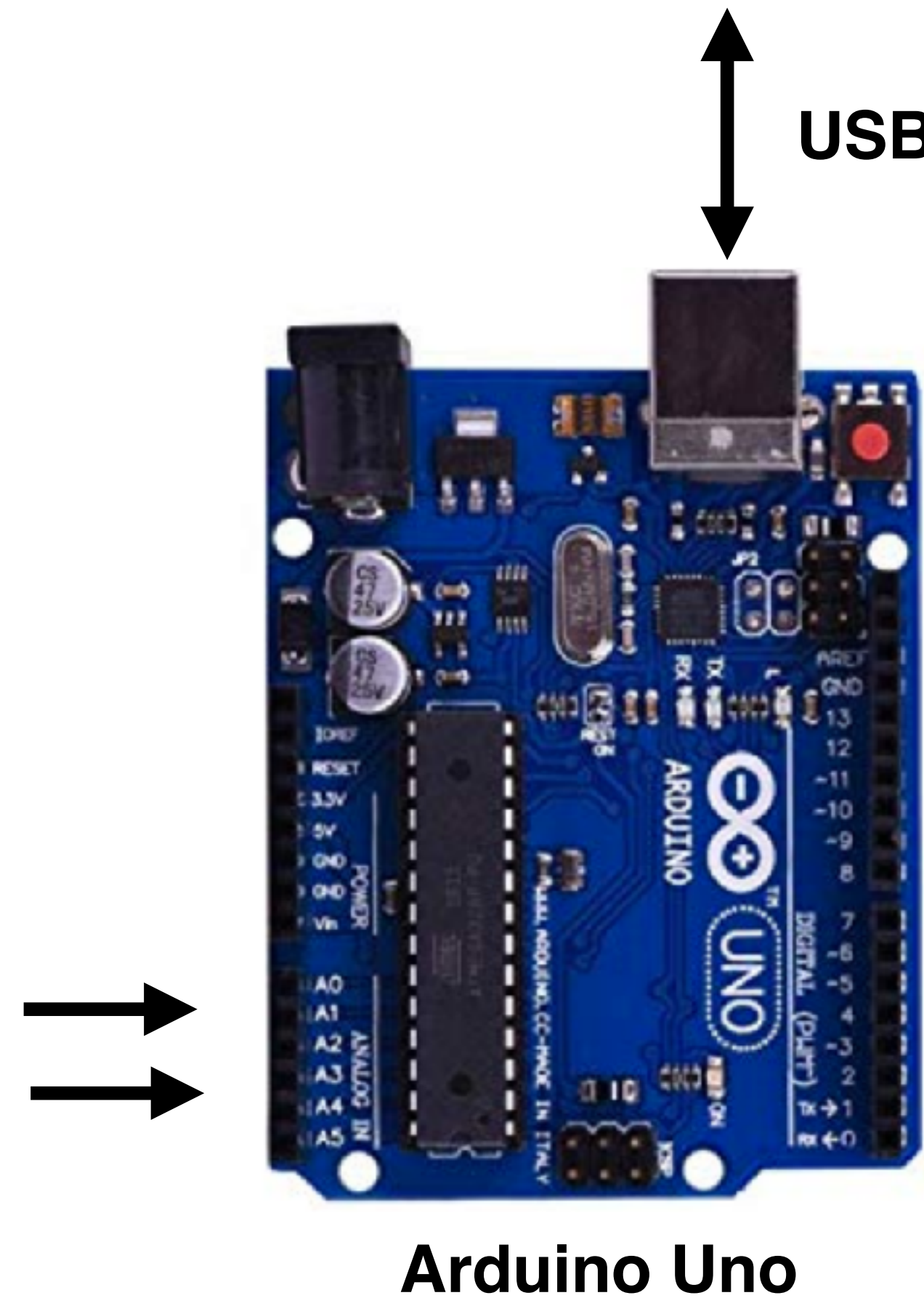
Programming UNO with 'Arduino sketch'
Serial communication (RS-232) Tx and Rx

6 x analogue input
A0 - A5

Voltage
input 0 - 5V

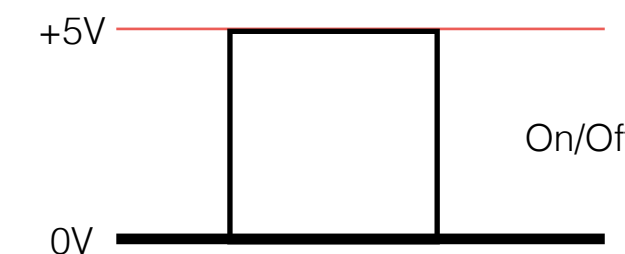


Input resolution = 10 bit = $2^{10} = 1024$

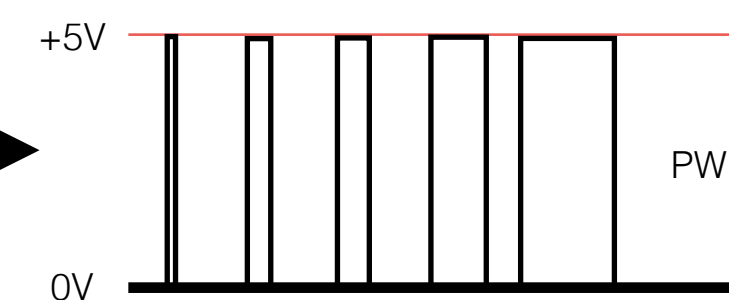


Arduino Uno

Voltage
output (0-5V)



6 x digital
outputs/inputs (1 bit)



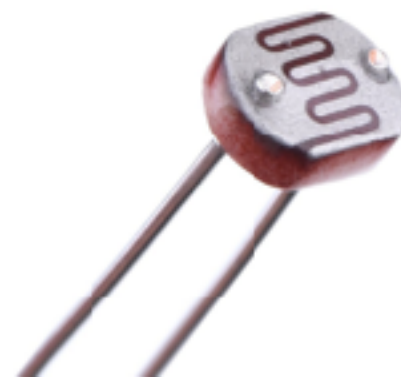
6 x 'analogue' pwm outputs
Resolution 8 bit

Output resolution = 8 bit = $2^8 = 256$

What is a sensor:

A sensor converts a **physical quantity** (like light, pressure, temperature, etc, etc, ...) into another physical quantity (like resistance, voltage, heat, ...).

Some examples:



Light Dependant Resistor
Light intensity to **resistance**



Potentiometer
Rotation/Position/Angle
to **resistance**

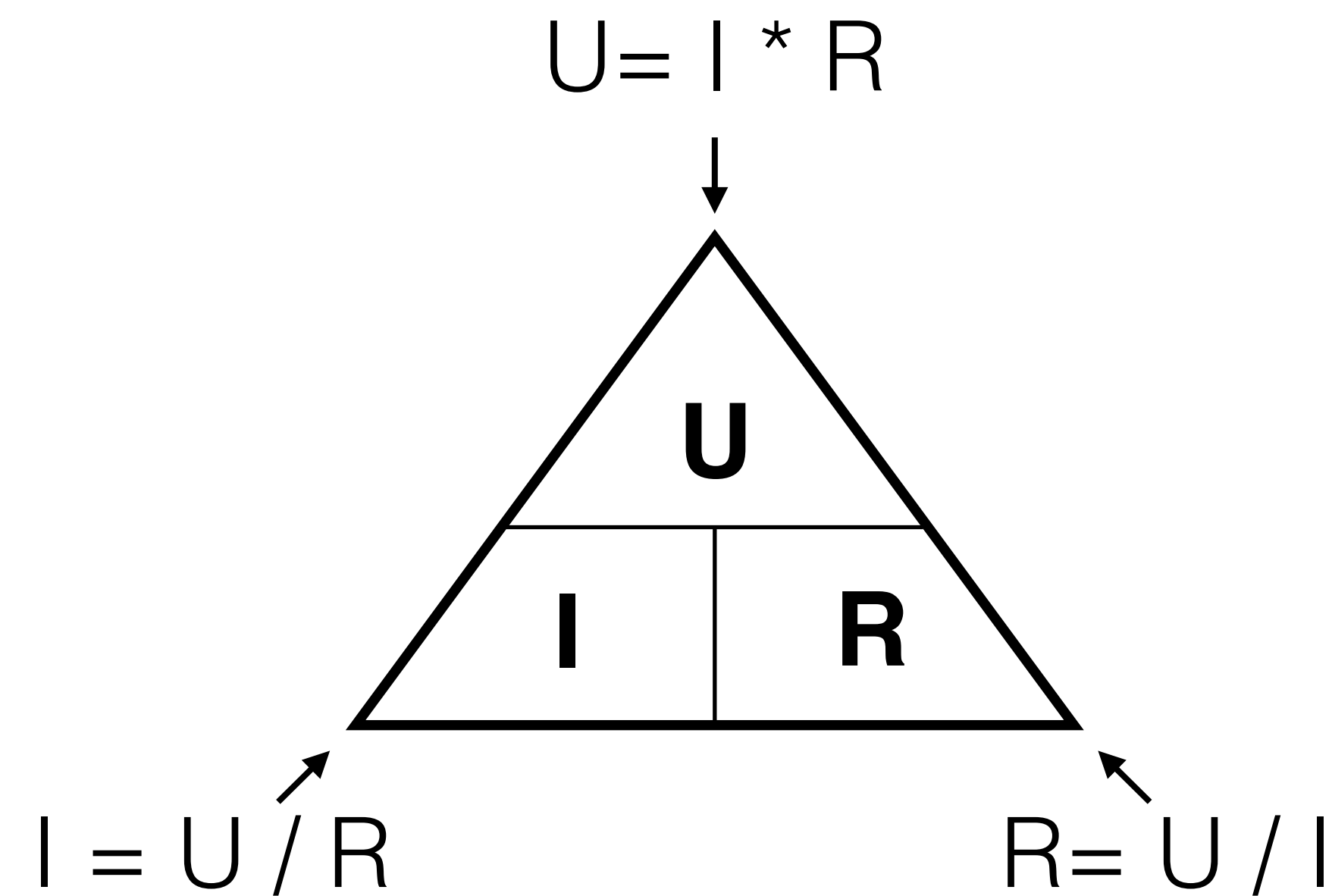


Switch
"Status" to **resistance**

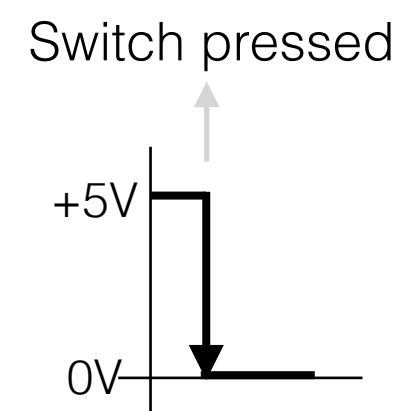
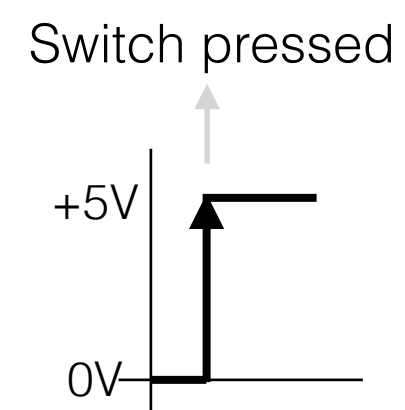
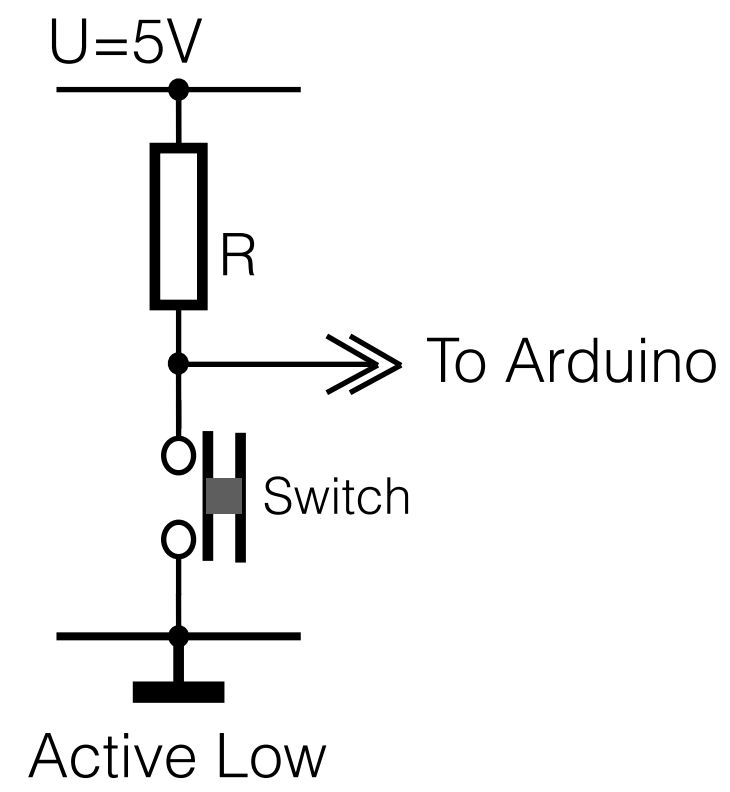
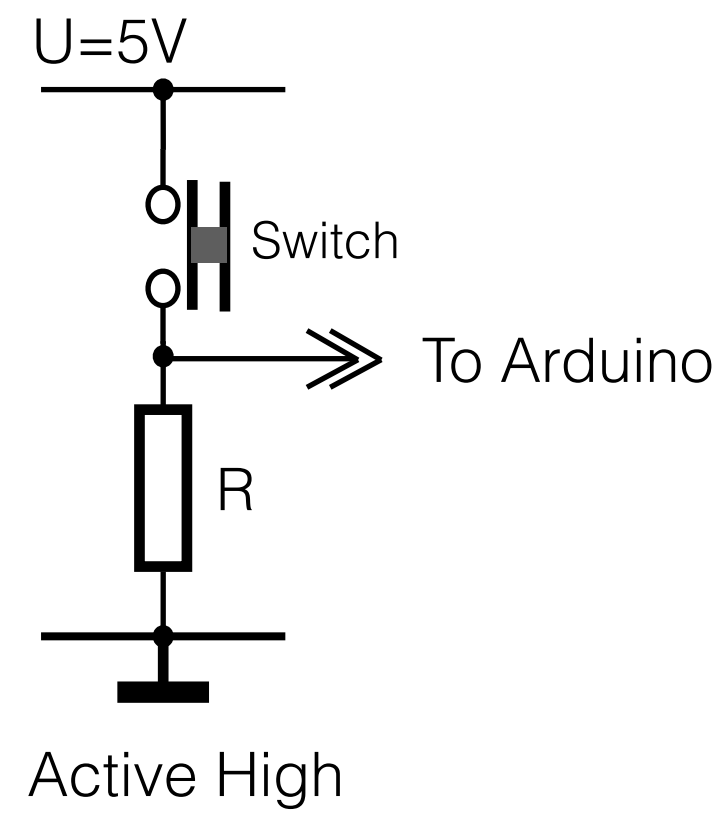
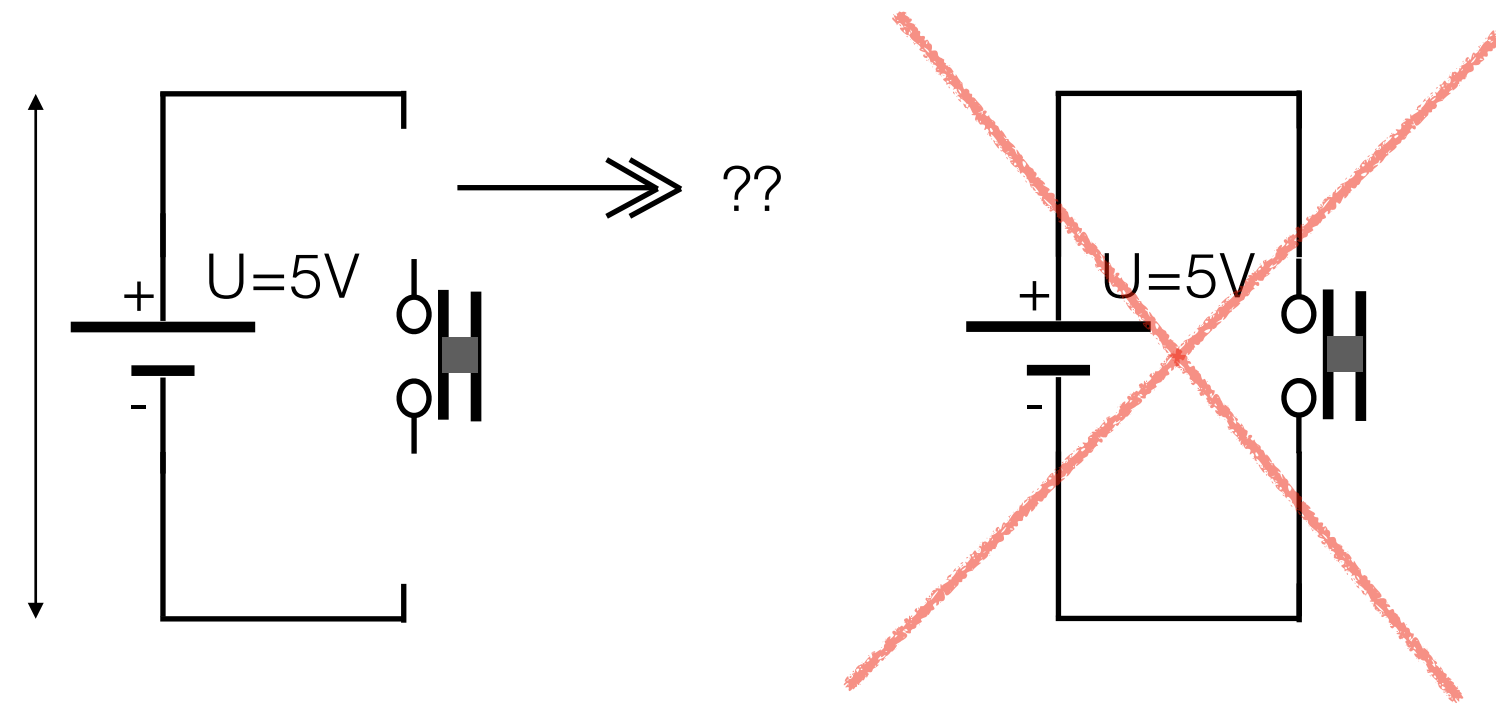
INPUT

Since an average sensor-interface takes
'voltage change' as an input,
'**resistance** change' has to be converted to
voltage 'change'!

Yes ... there it comes: Ohm's law!

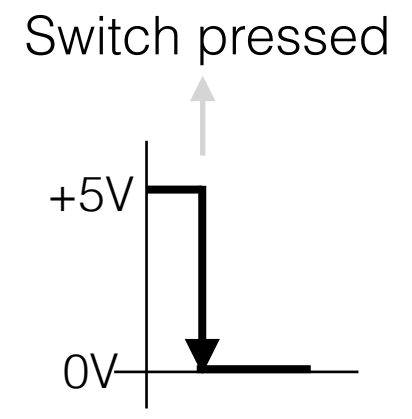
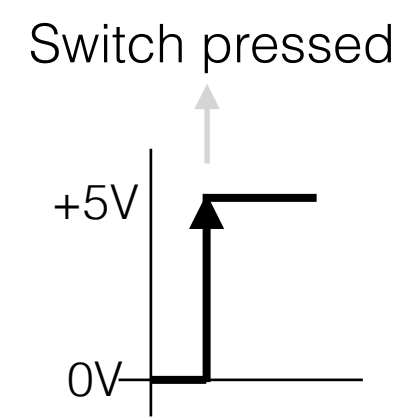
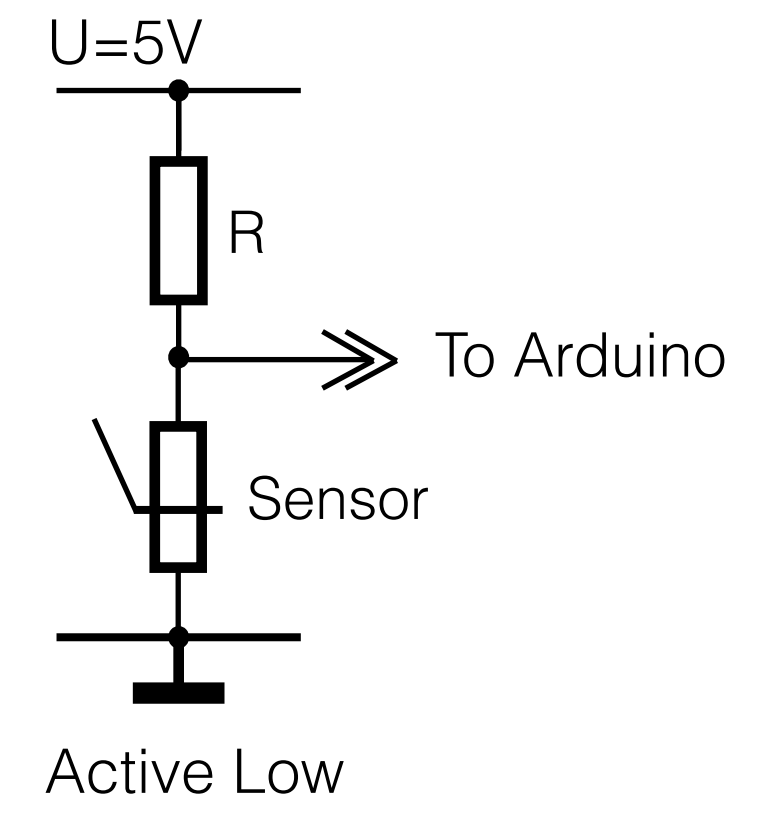
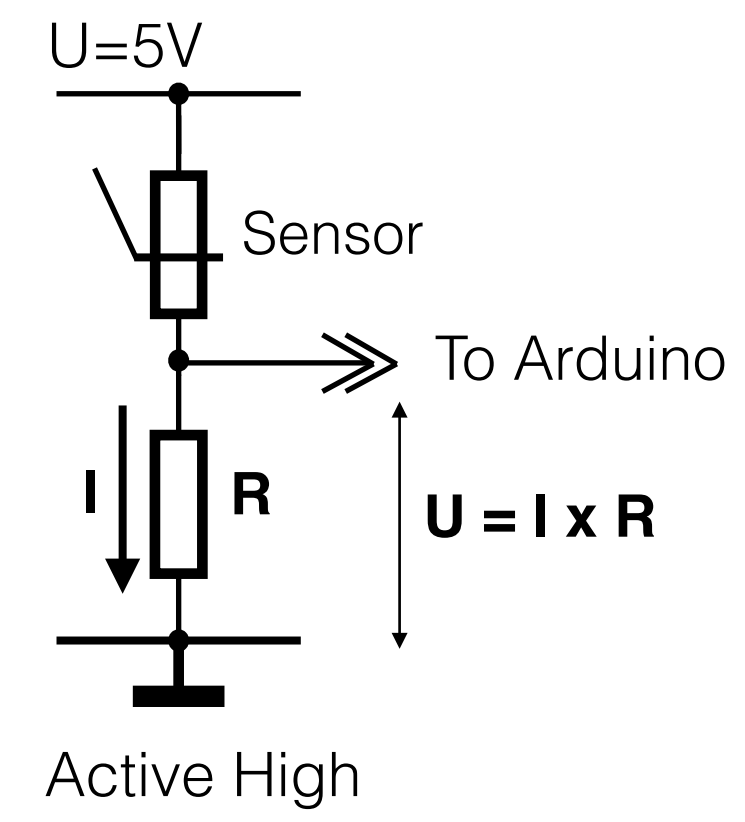
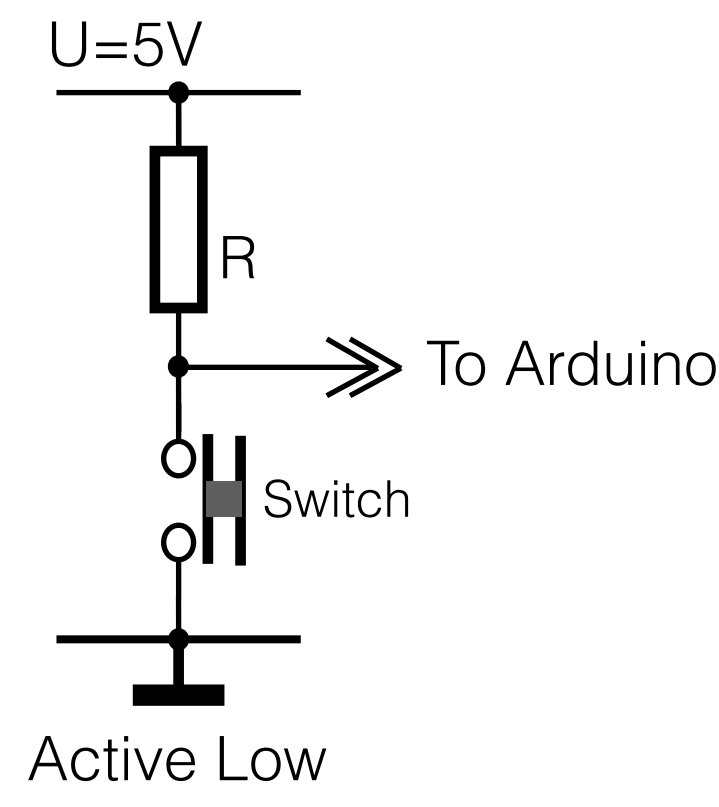
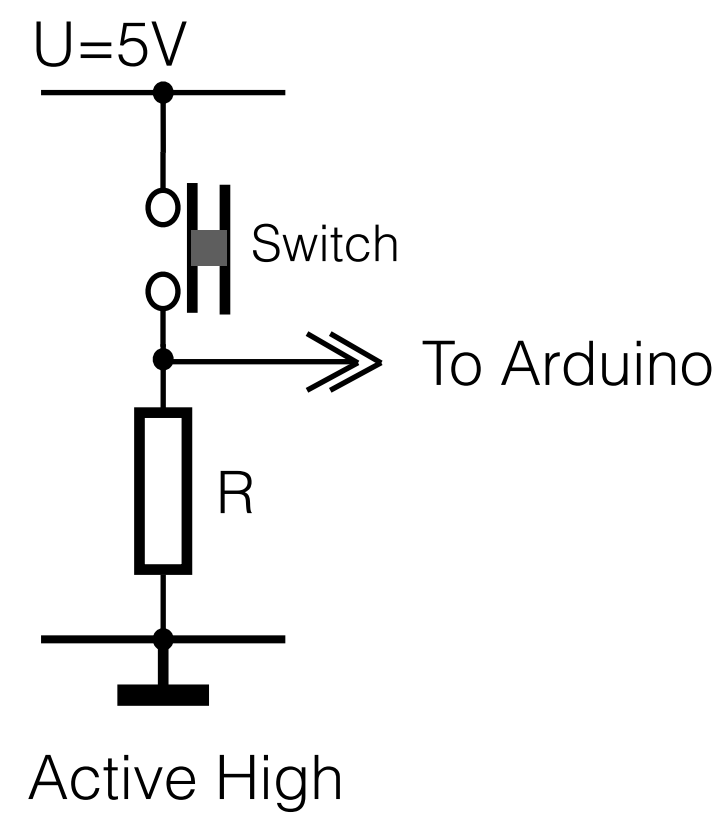
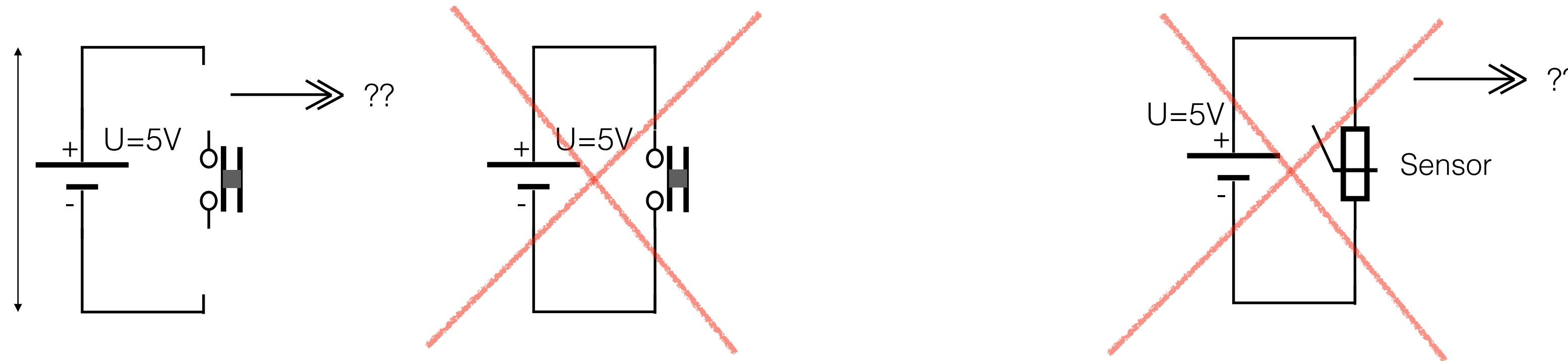


We need an extra resistor to convert the current change into voltage change



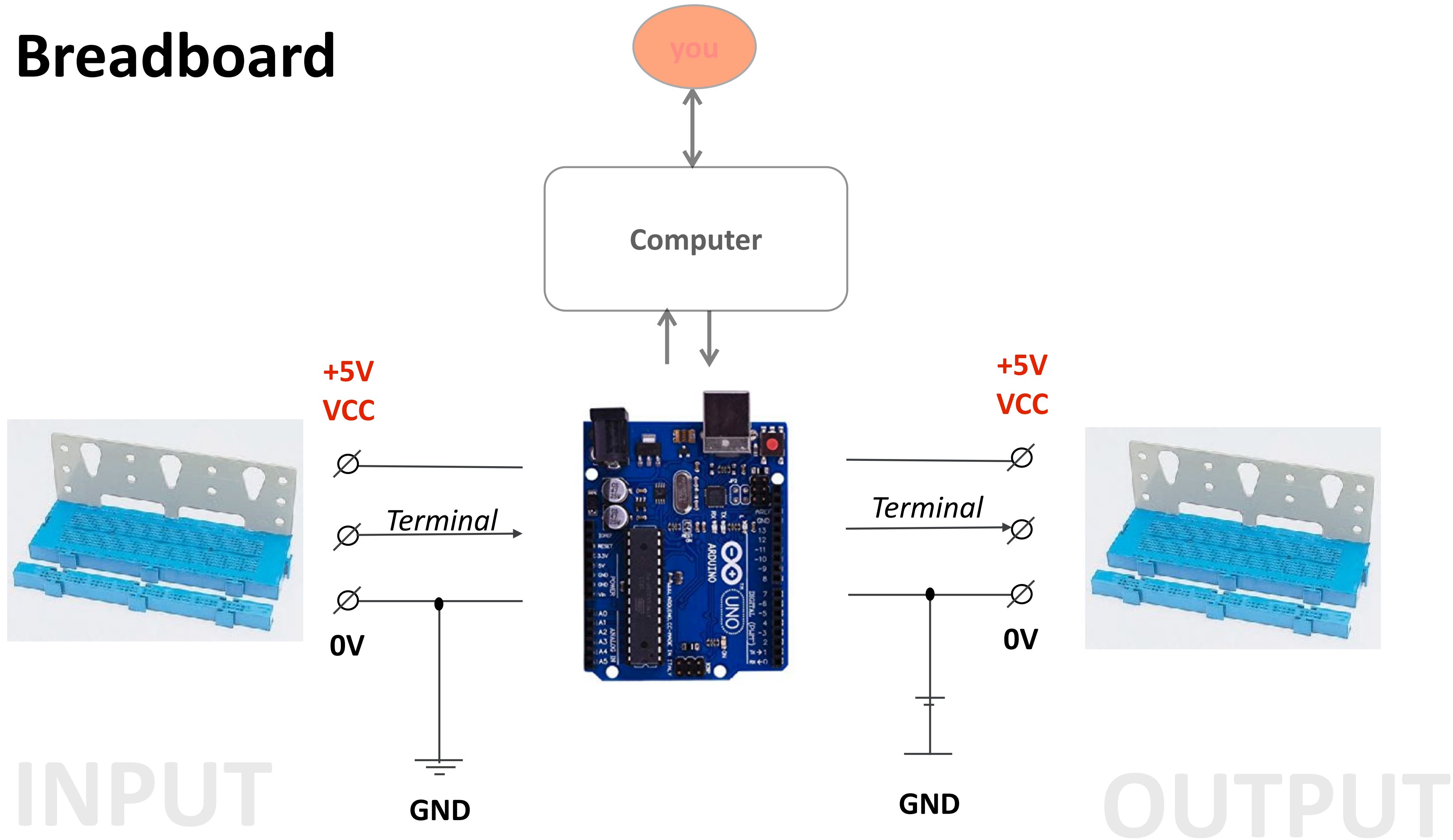
INPUT

We need an extra resistor to convert the current change into voltage change



INPUT

Breadboard



Breadboard layout

