

DramaLab

Sensors

MAP Function

- you might need to convert the data from your sensors value range into your own value range
- e.g. photoresistor values between -231 - + 1357, your desired range: 0 - 100

MAP Function

```
long map(long x, long in_min, long in_max, long out_min, long out_max)
{
    return (x - in_min) * (out_max - out_min) / (in_max - in_min) + out_min;
}
```

use like this:

```
val = map(val, 0, 1023, 0, 255);
```

MAP Function

Attention: not an even distribution!

```
map(0..1023, 0, 1023, 0, 15);
```

0	69
1	68
2	68
3	68
4	68
5	69
6	68
7	68
8	68
9	68
10	69
11	68
12	68
13	68
14	68
15	1

from documentation: The map() function uses integer math so will not generate fractions, when the math might indicate that it should do so. Fractional remainders are truncated, and are not rounded or averaged.

example taken from: <http://www.jetmore.org/john/blog/2011/09/arduinios-map-function-and-numeric-distribution/>

MAP Function

Solution: increase in_max and out_max by 1

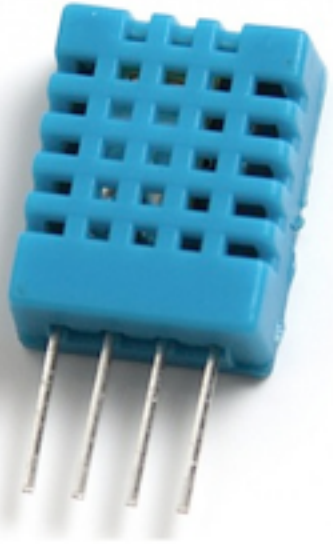
```
map(0..1023, 0, 1024, 0, 16);
```

0	64
1	64
2	64
3	64
4	64
5	64
6	64
7	64
8	64
9	64
10	64
11	64
12	64
13	64
14	64
15	64

... and use constrain(x, a, b)

example taken from: <http://www.jetmore.org/john/blog/2011/09/arduinom-map-function-and-numeric-distribution/>

DHT-11



temperature and humidity sensor

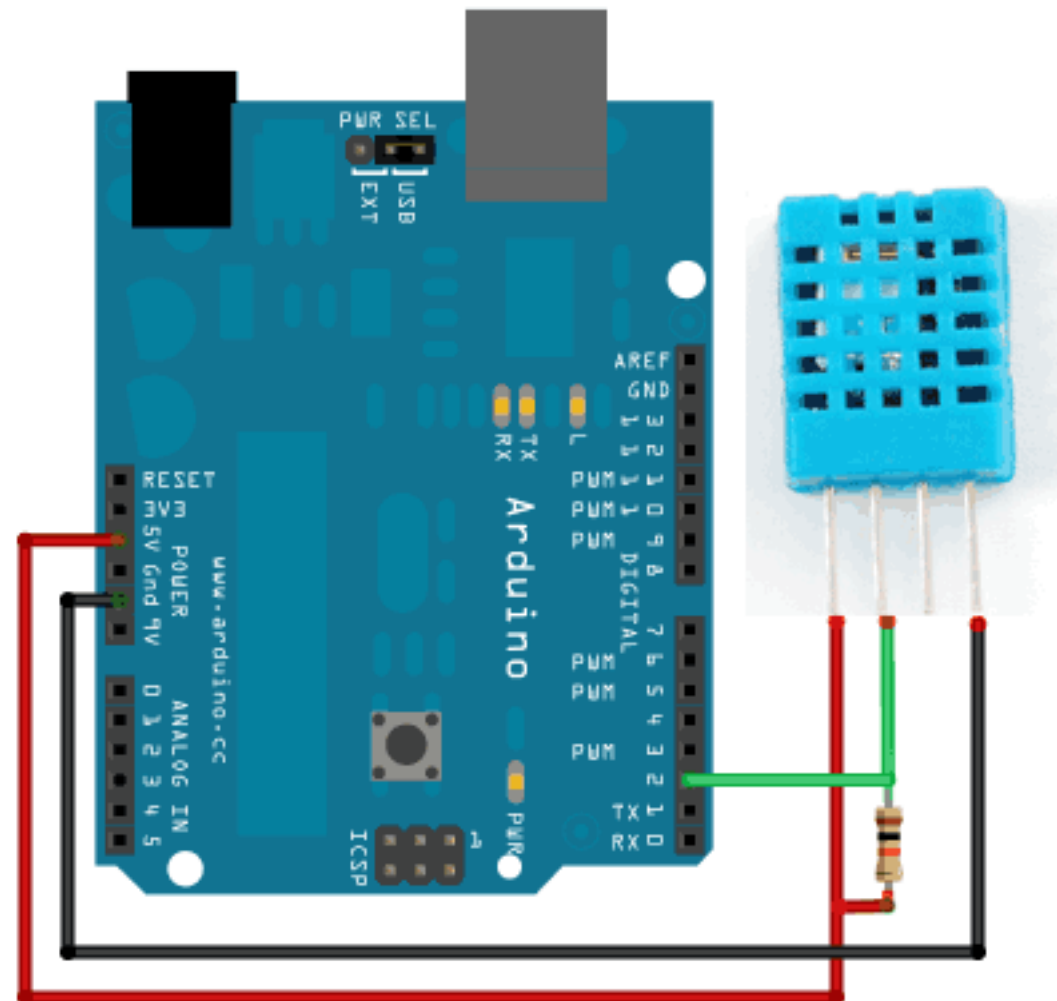
low cost (3-5€)

good for 20-80% humidity readings with 5% accuracy

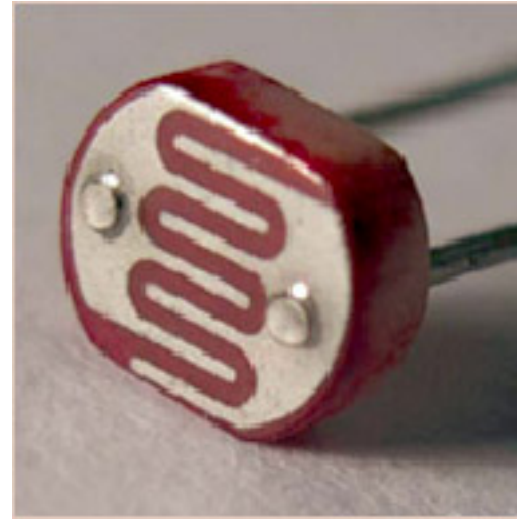
good for 0-50°C temperature readings $\pm 2^\circ\text{C}$ accuracy

no more than 1 Hz sampling rate

DHT-11

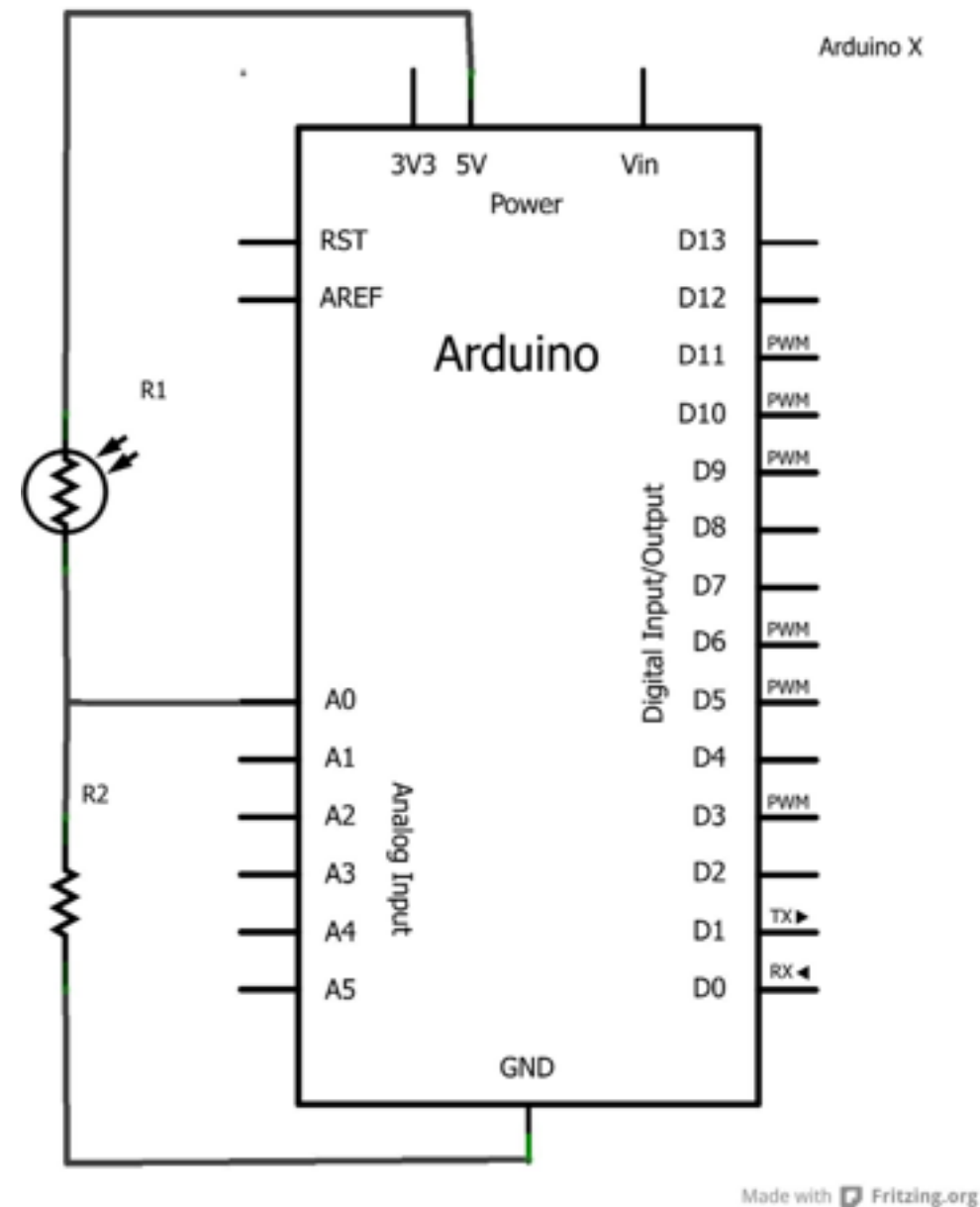


LDR - Photoresistor

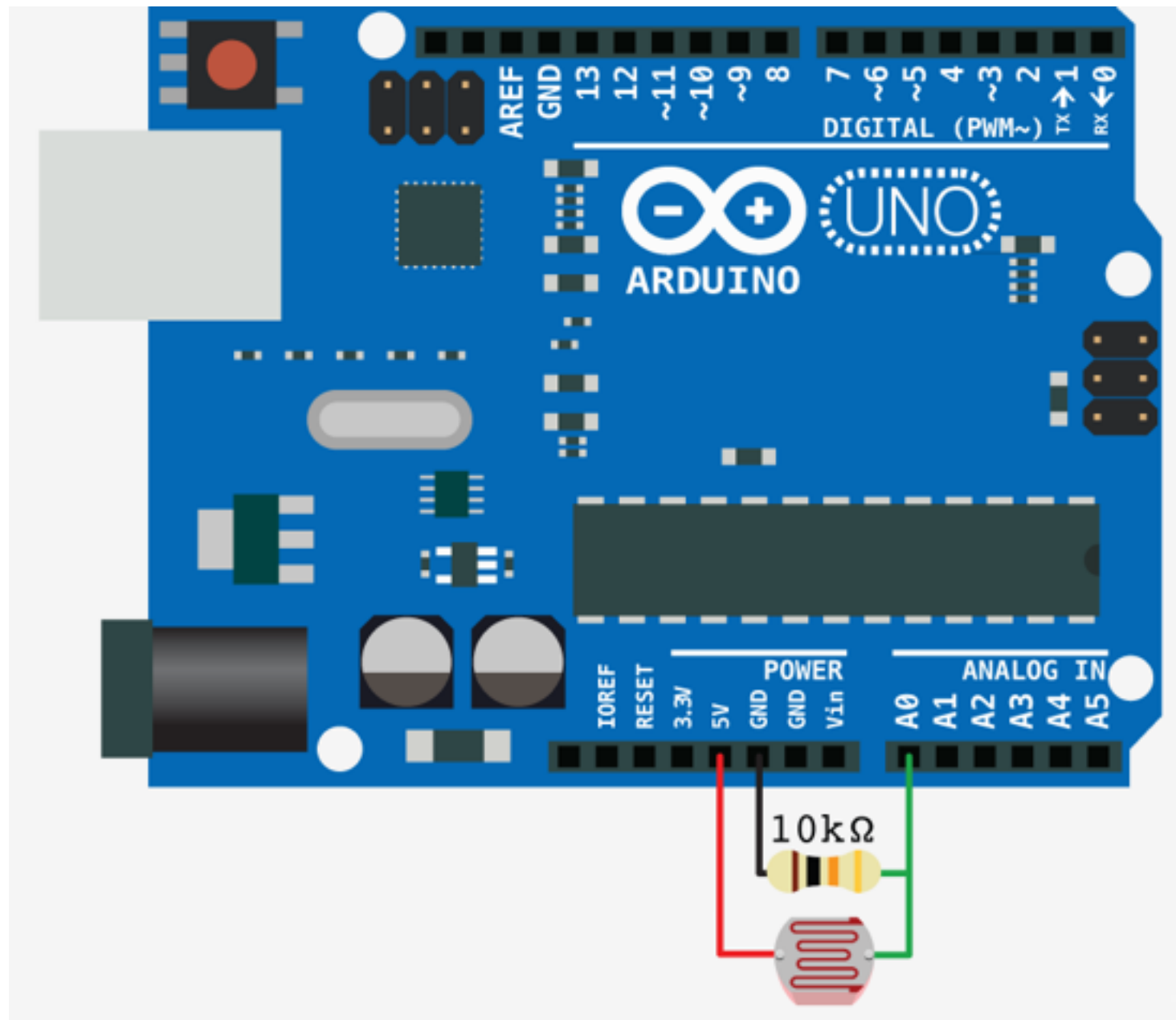


changes resistance based on sensed light

LDR - Photoresistor



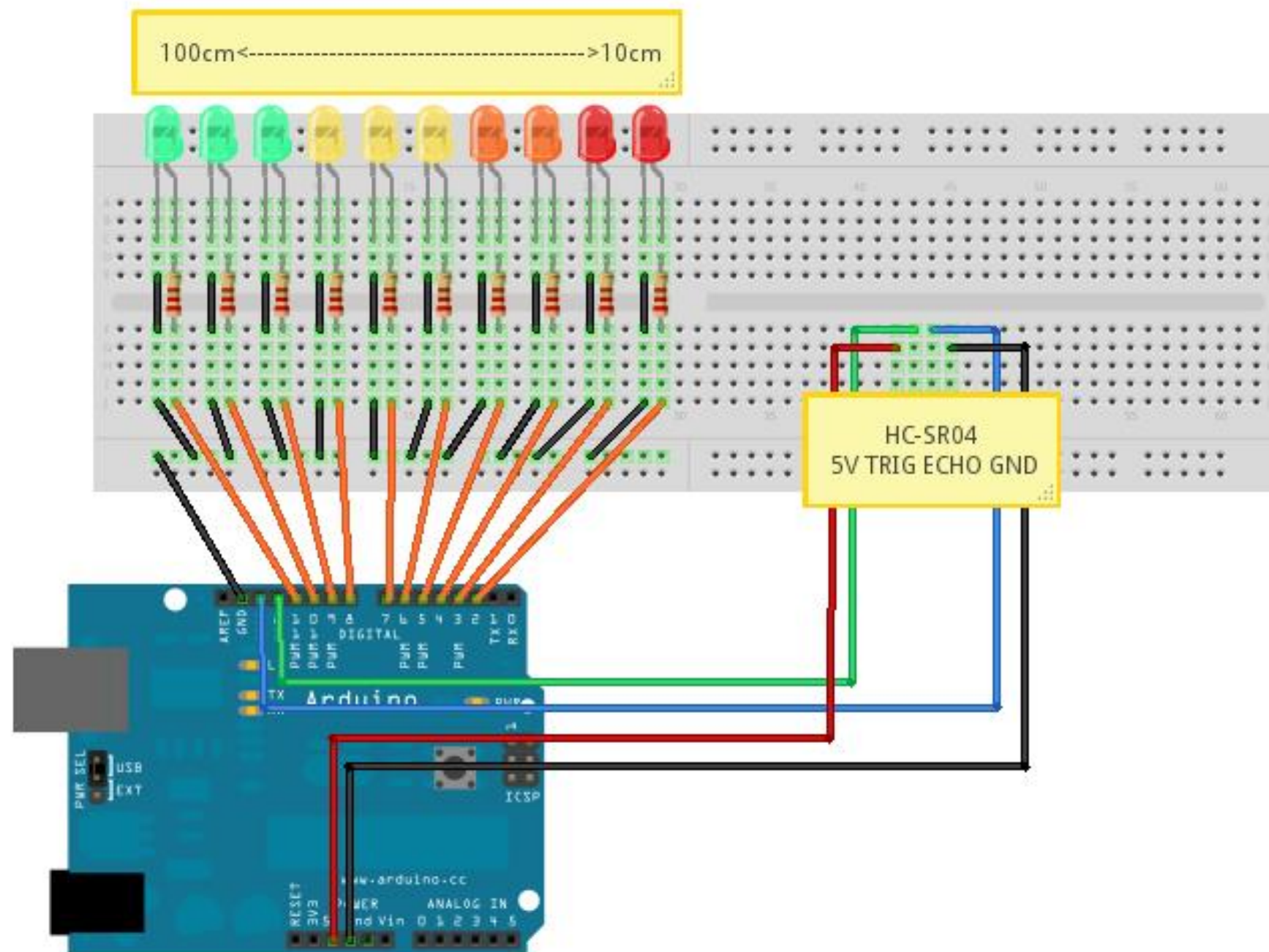
LDR - Photoresistor



HC SR04 - Ultrasonic



HC SR04 - Ultrasonic



Joystick



internally contains a series of resistors
resistance varies based on knob position
read using `analogRead()`

Motion Sensor



measures angular velocity along the pitch and yaw axes

