Lesson 4 Photoresistor

Introduction

A photoresistor or photocell is a light-controlled variable resistor. The resistance of a photoresistor decreases with increasing incident light intensity; in other words, it exhibits photoconductivity. A photoresistor can be applied in light-sensitive detector circuits, and light- and darkness-activated switching circuits.

Components

- 1 * Arduino Uno board

- 1 * USB data cable

- 1 * Photoresistor

- 1 * Resistor (10KΩ)

- 8 * LED

- 8 * Resistor (220Ω)

- Jumper wires

-1 * Breadboard

Experimental Principle

The resistance of a photoresistor changes with incident light intensity. If the light intensity gets higher, the resistance decreases; if it gets lower, the resistance increases.

In this experiment, we will use eight LEDs to show the light intensity. The higher the light intensity is, the more LEDs will light up. When the light intensity is high enough, all the LEDs will be on. When there is no light, all the LEDs will go out.

Step 1: Build the circuit
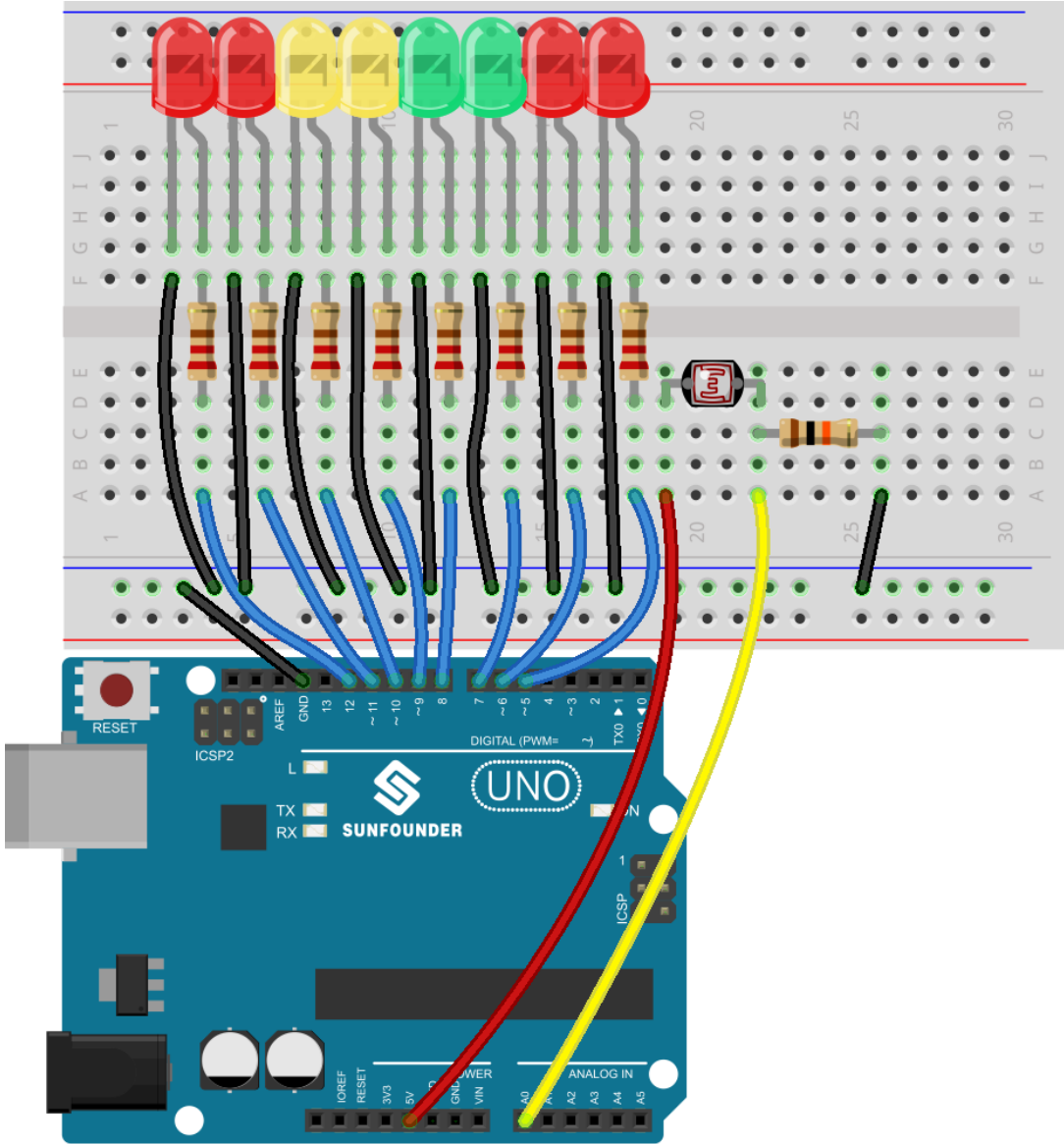
Code

```
/*********************************
* name:Photoresistor
* function: if you shine the photoresistor with a certain light intensity,
you will see several LEDs light up.
* If you increase the light intensity, you will see more LEDs light up.
* When you place it in dark environment, all the LEDs will go out.
*********************************************/
const int NbrLEDs = 8;//8 leds
const int ledPins[] = {5, 6, 7, 8, 9, 10, 11, 12};//8 leds attach to pin 5-12
respectively
const int photocellPin = A0; //photoresistor attach to A0
int sensorValue = 0; // value read from the sensor
int ledLevel = 0; // sensor value converted into LED 'bars'
void setup()
{
for (int led = 0; led < NbrLEDs; led++)
{
pinMode(ledPins[led], OUTPUT);// make all the LED pins outputs
}
}
void loop()
{
sensorValue = analogRead(photocellPin); //read the value of A0
ledLevel = map(sensorValue, 300, 1023, 0, NbrLEDs); // map to the number of
LEDs
for (int led = 0; led < NbrLEDs; led++)//
{
if (led < ledLevel ) //When led is smaller than ledLevel, run the following
code.
{
digitalWrite(ledPins[led], HIGH); // turn on pins less than the level
}
else
{
digitalWrite(ledPins[led],LOW); // turn off pins higher than
}
}
}
```