

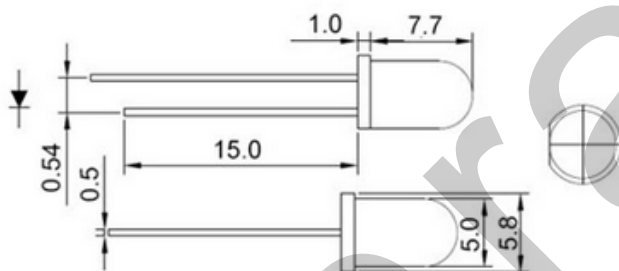
Fading

Overview



This example demonstrates the use of analog output (Pulse Width Modulation (PWM)) to fade an LED. PWM is a technique for getting an analog-like behavior from a digital output by switching it off and on very fast and with different ratio between on and off time.






Specification



Pin definition

LED		UNO R3
Long pin	->	+5V
Short pin	->	GND

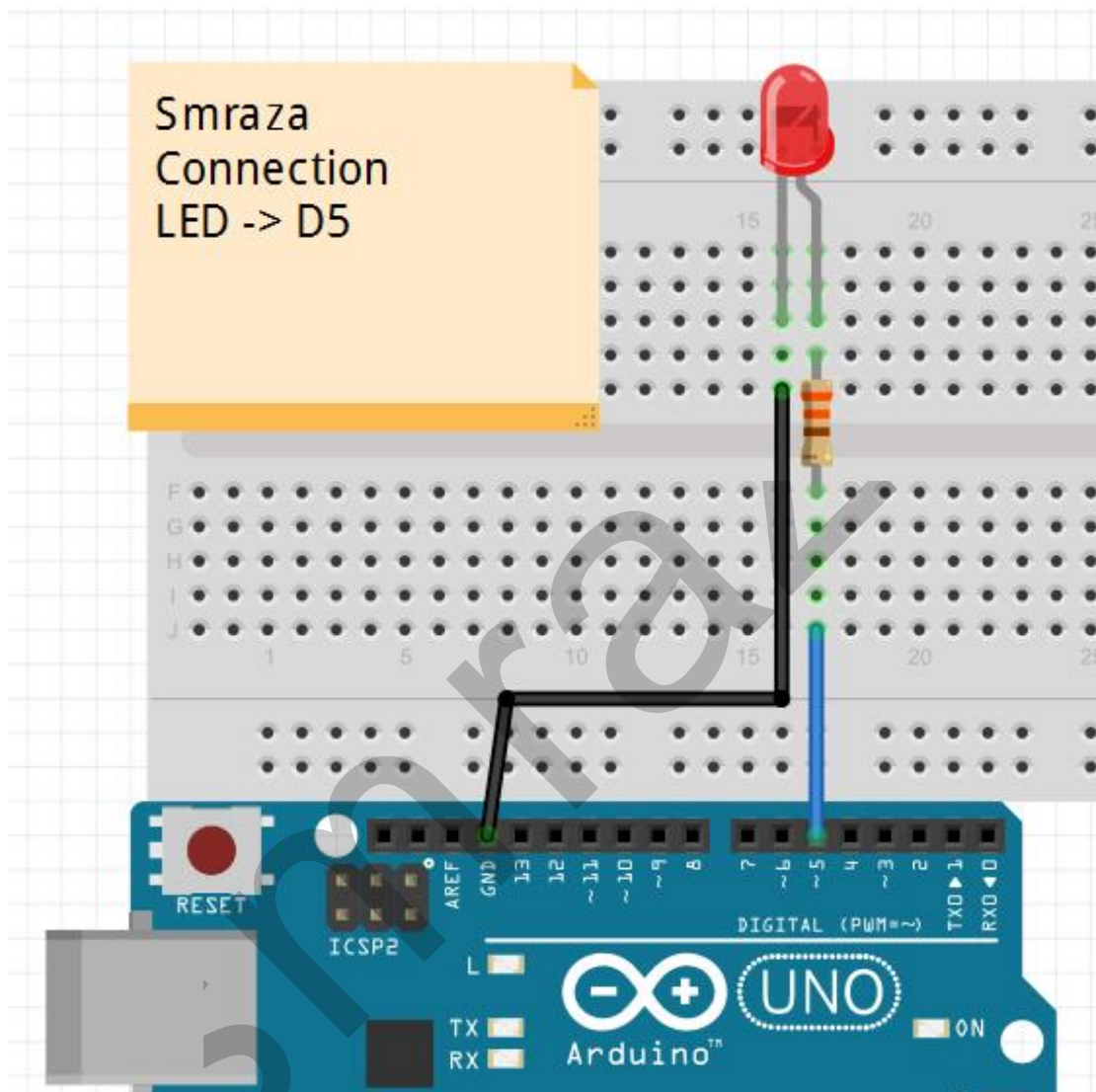
Hardware required

Material diagram	Material name	Number
	220/330Ω resistor	1
	LED	1
	USB Cable	1
	UNO R3	1
	Breadboard	1

V1.0

	Jumper wires	Several
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Connection diagram



Note : An LED connected to digital output pin 5 (D5) through a 220 ohm resistor.

Sample code

Note : sample code under the **Sample code** folder

```
int ledPin = 5;    // LED connected to digital pin 5

void setup() {
  // nothing happens in setup
}
```

V1.0

```
void loop() {  
  // fade in from min to max in increments of 5 points:  
  for (int fadeValue = 0 ; fadeValue <= 255; fadeValue += 5) {  
    // sets the value (range from 0 to 255):  
    analogWrite(ledPin, fadeValue);  
    // wait for 30 milliseconds to see the dimming effect  
    delay(30);  
  }  
  
  // fade out from max to min in increments of 5 points:  
  for (int fadeValue = 255 ; fadeValue >= 0; fadeValue -= 5) {  
    // sets the value (range from 0 to 255):  
    analogWrite(ledPin, fadeValue);  
    // wait for 30 milliseconds to see the dimming effect  
    delay(30);  
  }  
}
```

Language reference

Tips : click on the following name to jump to the web page.

If you fail to open, use the Adobe reader to open this document.

[+= \(add assign\)](#)

[-= \(subtract assign\)](#)

[<= \(less than or equal to\)](#)

[>= \(greater than or equal to\)](#)

Application effect

You'll see that LED has the effect of breathing light.