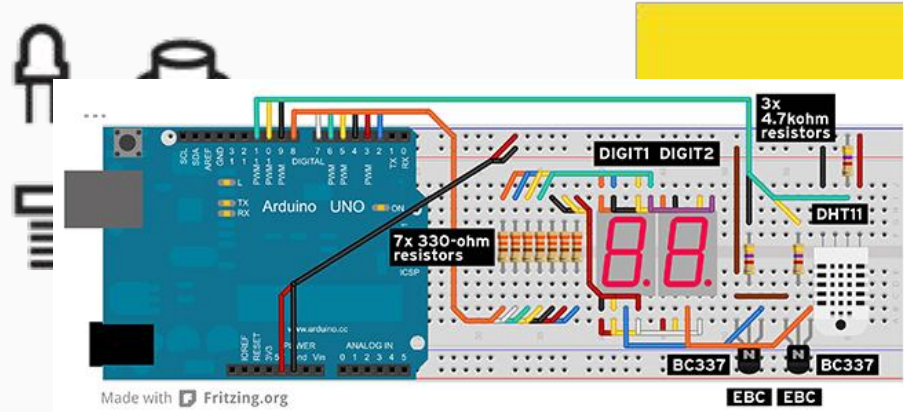


Dando vida ao Arduino com JS

Lucas Cavalcanti, Lhaís Rodrigues, Gabriel Bandeira
{lhcs, lrs4, gmb} @cin.ufpe.br

O que estamos fazendo aqui?

```
var args = arguments.callee.arguments;
var len = args.length;
for (var i = 0; i < len; i++) {
    if (args[i].hasOwnProperty(p) && c(d[i])) {
        if (len > 1) {
            return [args[i].length];
        } else {
            return [args[i].length];
        }
    }
}
```



Roteiro

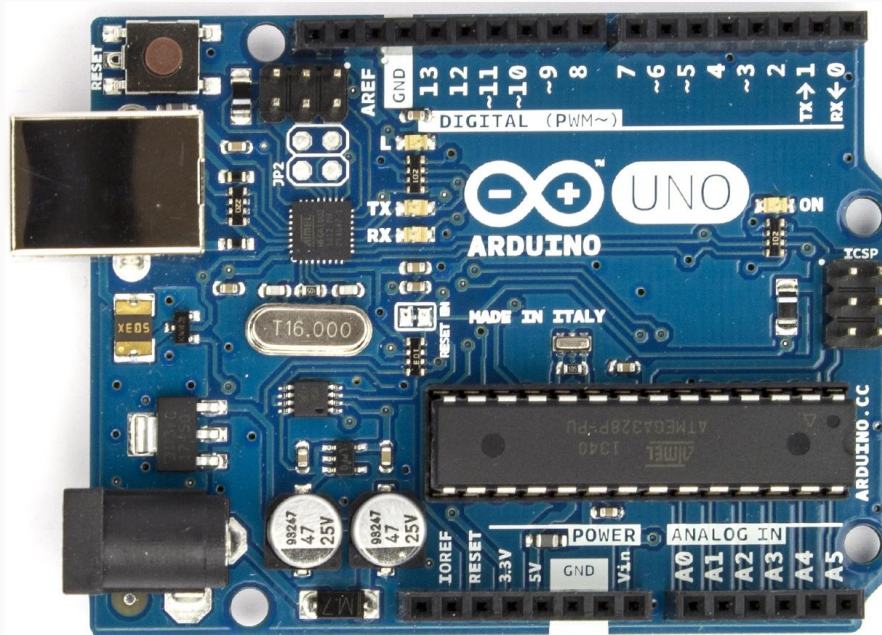
- Introdução a Arduino
- Introdução ao Johnny-Five
- Setup
- Hello Word
- Projetos

Apresentação: <https://goo.gl/JYK3Jf>

GitHub: <https://goo.gl/t832zA>



O que é Arduino?



```
/*  
  Blink  
  Turns on an LED on for one second, then off for one second  
  
  This example code is in the public domain.  
  */  
  
void setup() {  
  // initialize the digital pin as an output.  
  // Pin 13 has an LED connected on most Arduino boards:  
  pinMode(13, OUTPUT);  
}  
  
void loop() {  
  digitalWrite(13, HIGH); // set the LED on  
  delay(1000);             // wait for a second  
  digitalWrite(13, LOW);  // set the LED off  
  delay(1000);             // wait for a second  
}
```



BOARDS



Arduino Uno



Arduino Leonardo



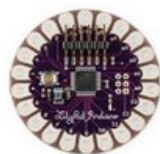
Arduino Mega ADK



Arduino Ethernet



LilyPad Arduino
SimpleSnap



LilyPad Arduino



Arduino Due



Arduino Yún



Arduino Mega 2560



Arduino Mini



Arduino Nano



Arduino Pro Mini



Arduino Tre



Arduino Micro



LilyPad Arduino USB



LilyPad Arduino
Simple



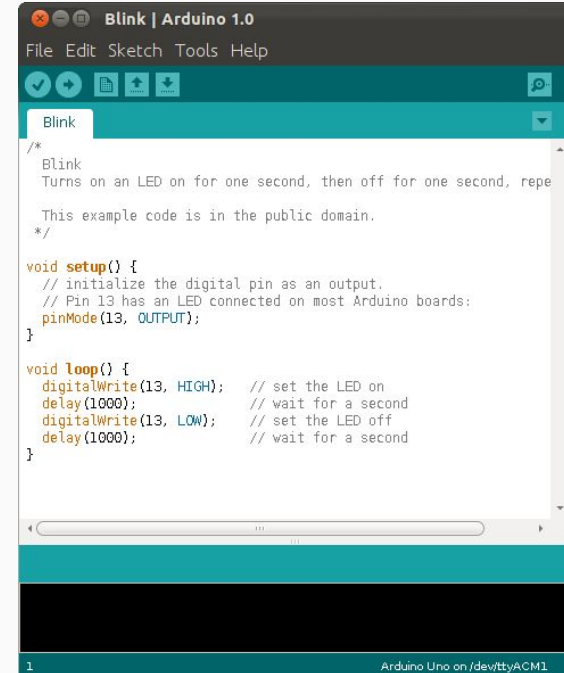
Arduino Pro

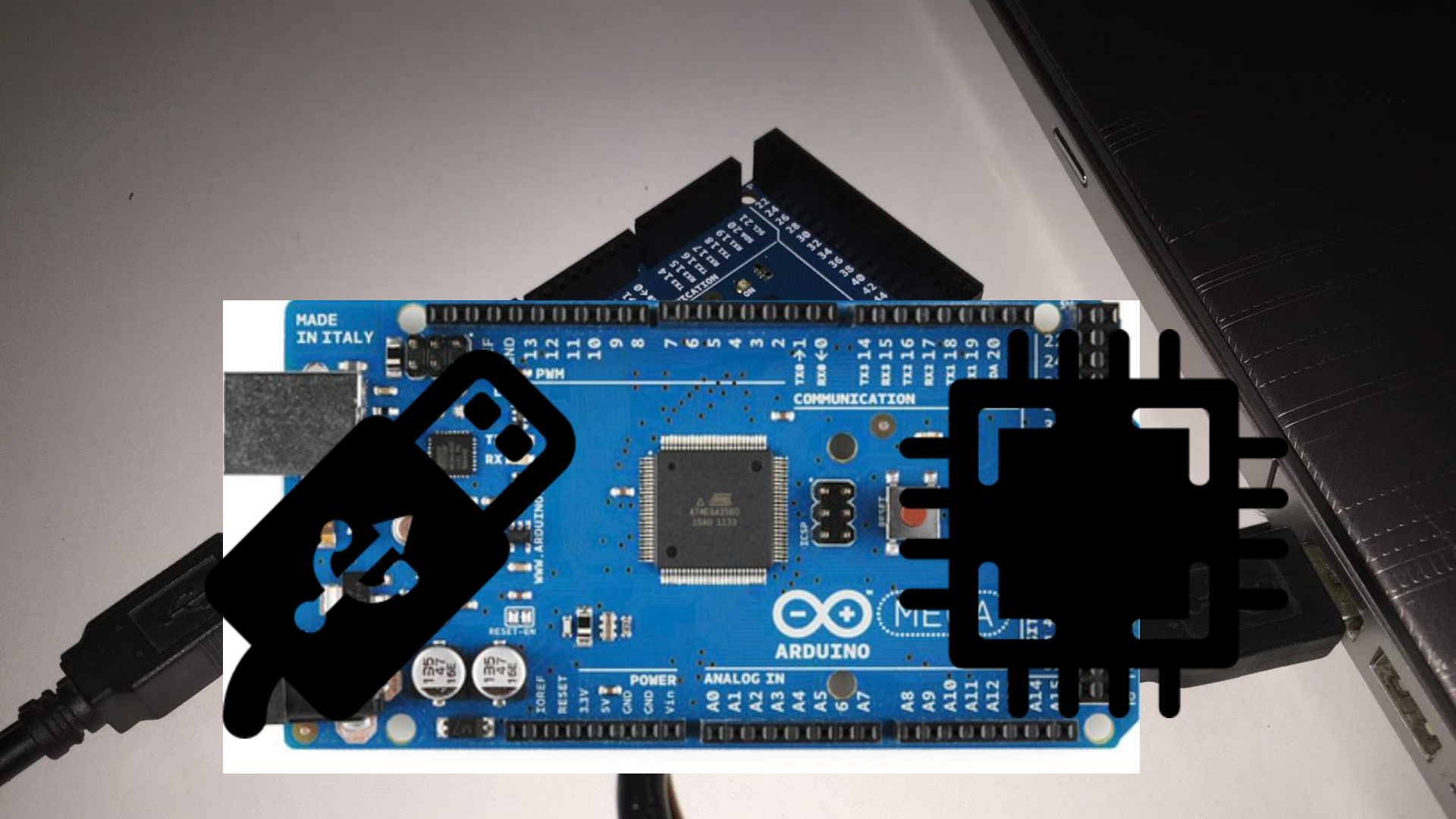


Arduino Fio

Instalando a IDE da Arduino

- <https://www.arduino.cc/en/Main/Software>
- `$ sudo apt-get install arduino`



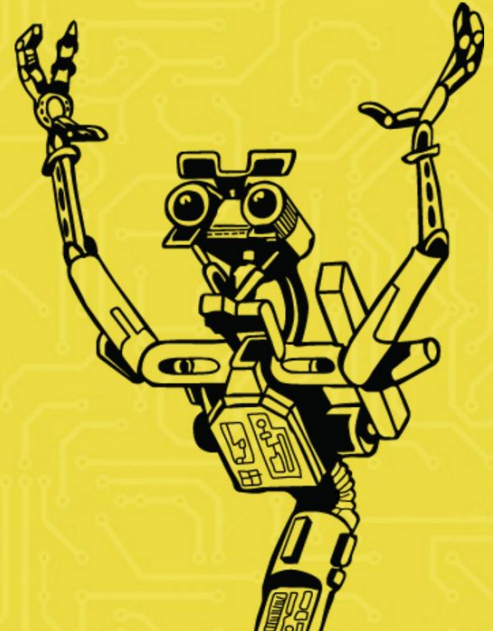


Onde entra JS?

Johnny-Five

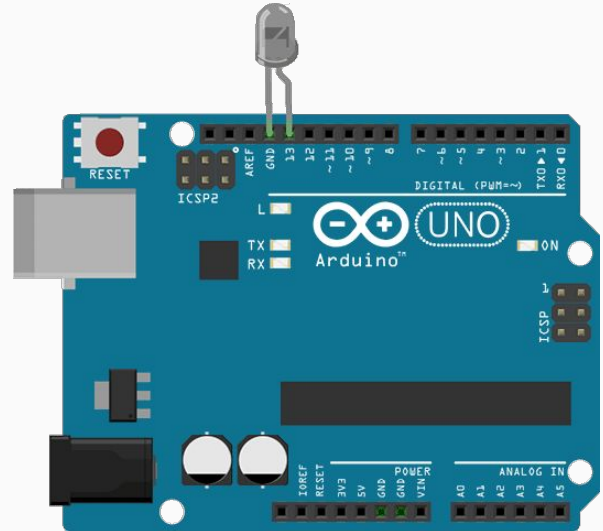
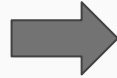
The JavaScript

Programming Framework

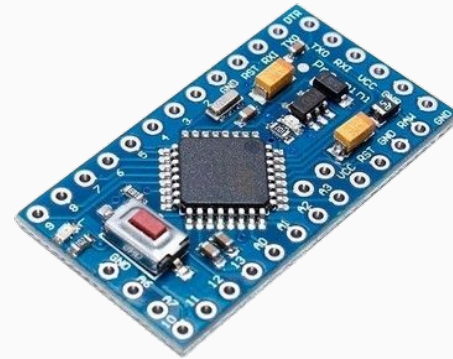
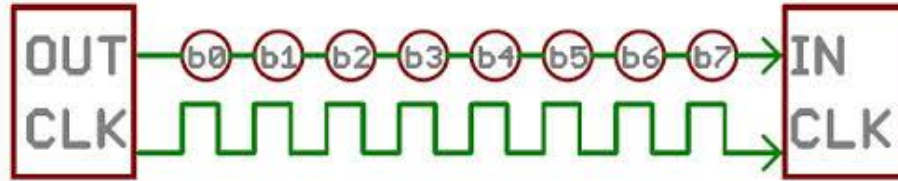


JS + Arduino

```
var five = require("johnny-five");  
var board = new five.Board();  
  
board.on("ready", function() {  
  var led = new five.Led(13);  
  led.blink(500);  
});
```



Como funciona?



Instalando Node.JS

- OSx
 - Install [Node.js](#) 0.10.x
 - Install Xcode ou GCG
- Linux
 - `$ curl -sL https://deb.nodesource.com/setup_4.x | sudo -E bash -`
 - `$ sudo apt-get install -y nodejs`
 - `$ sudo apt-get install -y build-essential`
- Windows
 - Install [Node.js](#) 0.10.x

Hello World

```
$ mkdir nodebots
```

```
$ cd nodebots
```

```
$ npm install johnny-five
```

blink.js:

```
// Carrega o Johnny-Five
var five = require("johnny-five");
// Carrega nova placa em board
var board = new five.Board();
// Quando a placa estiver pronta execute function
board.on("ready", function() {
  // Se conecta ao led no pino 13
  var led = new five.Led(13);
  // Pisca led com valor padrão (100ms)
  led.blink(100);
});
```


Upload Standard Firmata

- Abrir a IDE do Arduino
- Abrir exemplo StandardFirmata.ino
 - Arquivo > Exemplos > Firmata > StandardFirmata
- Selecionar porta e placa
- Upload



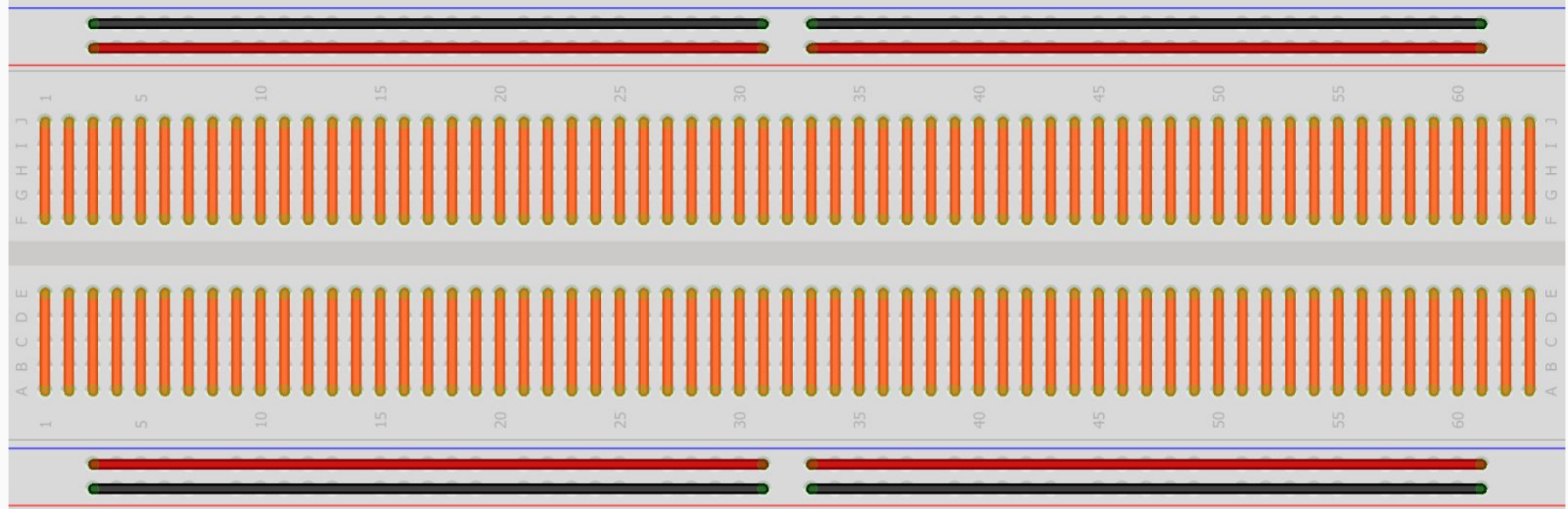
Run

\$ node blink.js

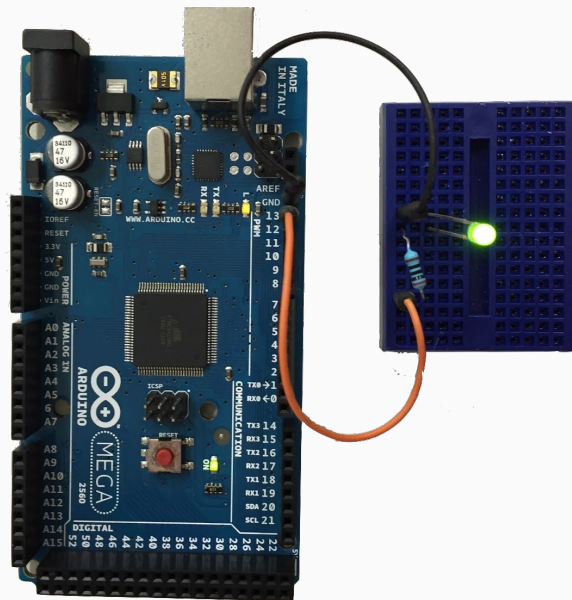
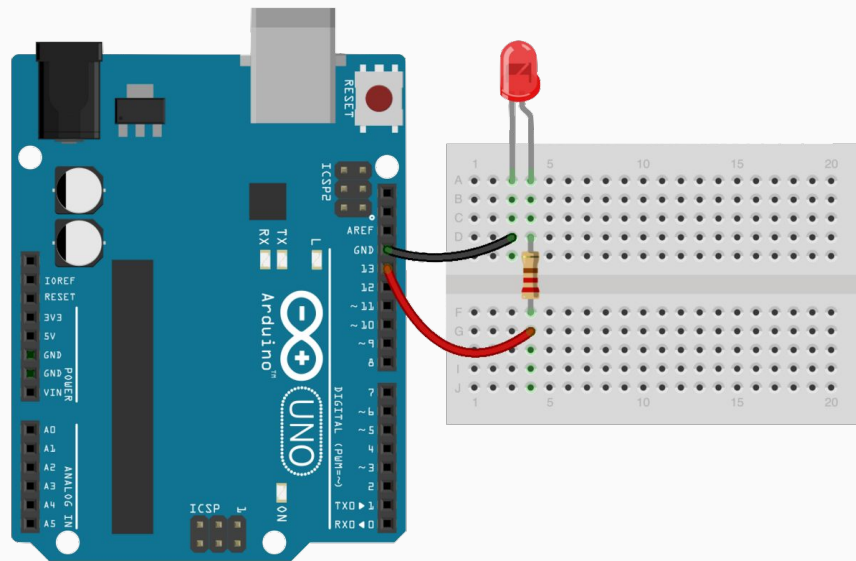


```
1449437423821 Device(s) /dev/cu.usbmodem1411
1449437423828 Connected /dev/cu.usbmodem1411
1449437426493 Repl Initialized
```

Um Pouco de Eletrônica



Conectando um LED



led.js

```
var five = require("johnny-five");  
var board = new five.Board();  
  
board.on("ready", function() {  
  var led = new five.Led(13);  
  led.pulse();  
  this.wait(10000, function() {  
    led.stop().off();  
  });  
});
```


Dúvidas?

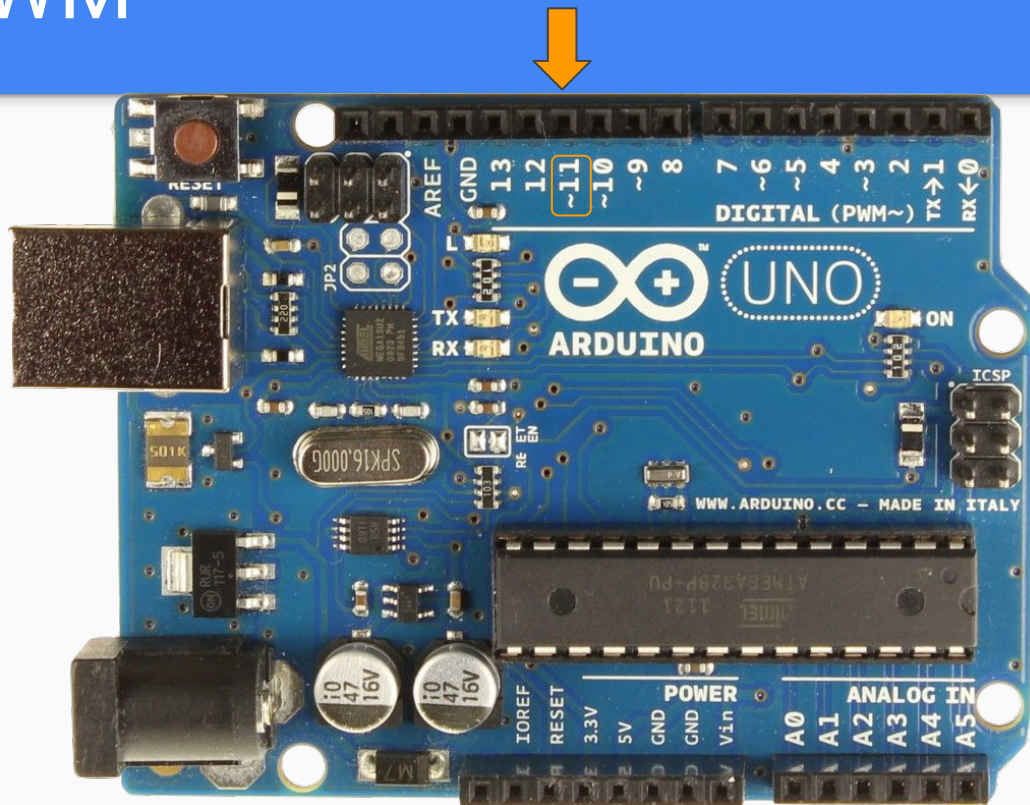
<http://johnny-five.io/api>

- **pulse(ms, callback)** Pulse the Led in phases from on to off over ms time, with an optional callback. This is an **interval** operation and can be stopped by calling `pin.stop()`, however that will not necessarily turn it "off". The callback will be invoked every time the Led is fully on or off. This operation will only work with Leds attached to PWM pins.

```
var led = new five.Led(11);
```

```
// Pulse from on to off in 500ms phases  
led.pulse(500);
```

Pinos PWM

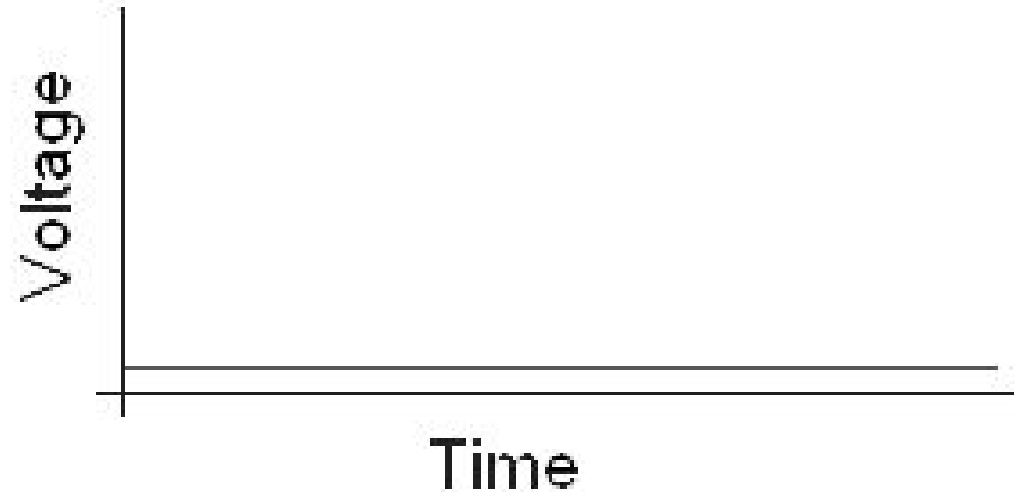


led2.js

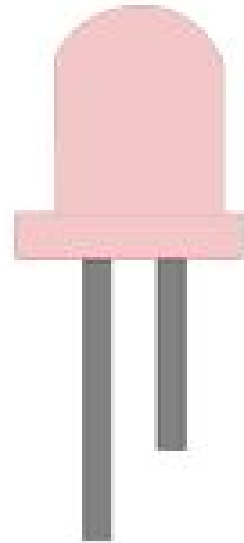
```
var five = require("johnny-five");  
var board = new five.Board();
```

```
board.on("ready", function() {  
  var led = new five.Led(11);  
  led.pulse();  
  this.wait(10000, function() {  
    led.stop().off();  
  });  
});
```

PWM?



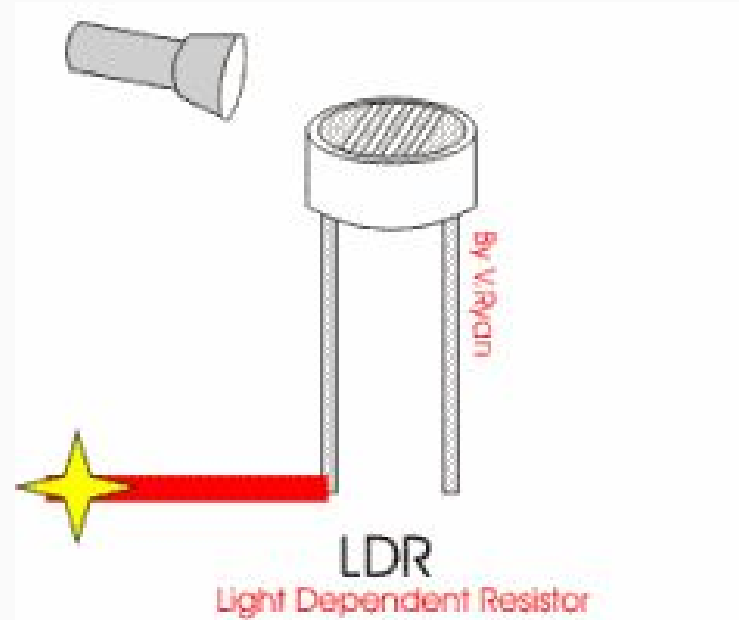
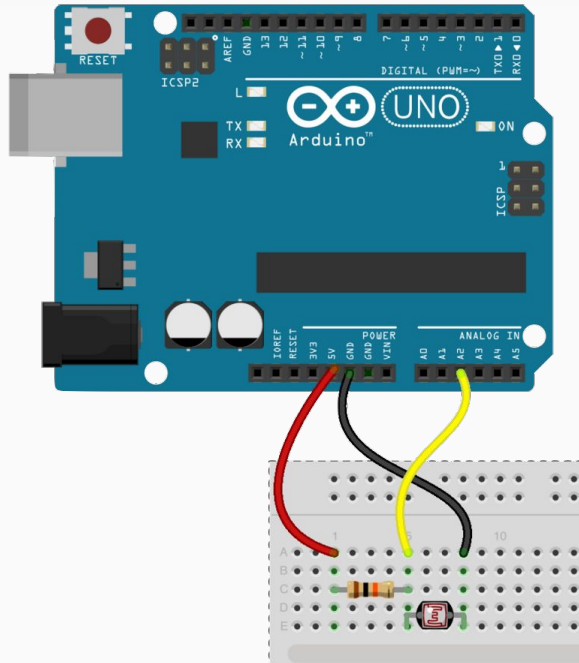
Duty Cycle: 0%



pwm.js

```
var five = require("johnny-five");  
var board = new five.Board();  
  
board.on("ready", function() {  
  var led = new five.Led(13);  
  led.brightness(128);  
});
```


Que tal um sensor?



ldr.js

```
var five = require("johnny-five"),
    board, photoresistor;
board = new five.Board();

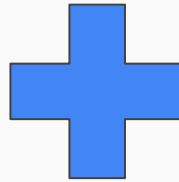
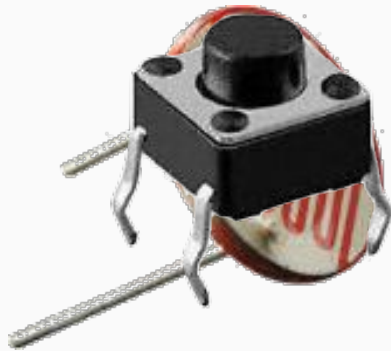
board.on("ready", function() {
  photoresistor = new five.Sensor("A0");
  photoresistor.on("change", function() {
    console.log(this.value);
  });
});
```

```
var five = require("johnny-five"),
    board, photoresistor;
board = new five.Board();
board.on("ready", function() {
  photoresistor = new five.Sensor({
    pin: "A0",
    freq: 250
  });
  photoresistor.on("data", function() {
    console.log(this.raw);
  });
});
```





Que tal?



<https://goo.gl/Y6W9Px>

Sensor de Proximidade



- Baixar PingFirmata para a Arduino
- Testar us.js

<https://goo.gl/BqxivMy>

Obrigado!



@lhcavalcanti



/lhcavalcanti



/lhcavalcantis



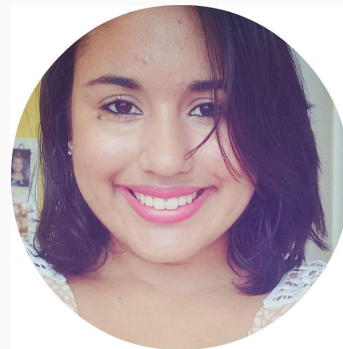
@gmbandeira



/gabriel.m.bandeira



/gmbandeira



@lhairsr



/lhais.rodrigues.5



/lhairsr

Referências

<http://johnny-five.io/>

<https://github.com/rwaldron/johnny-five>