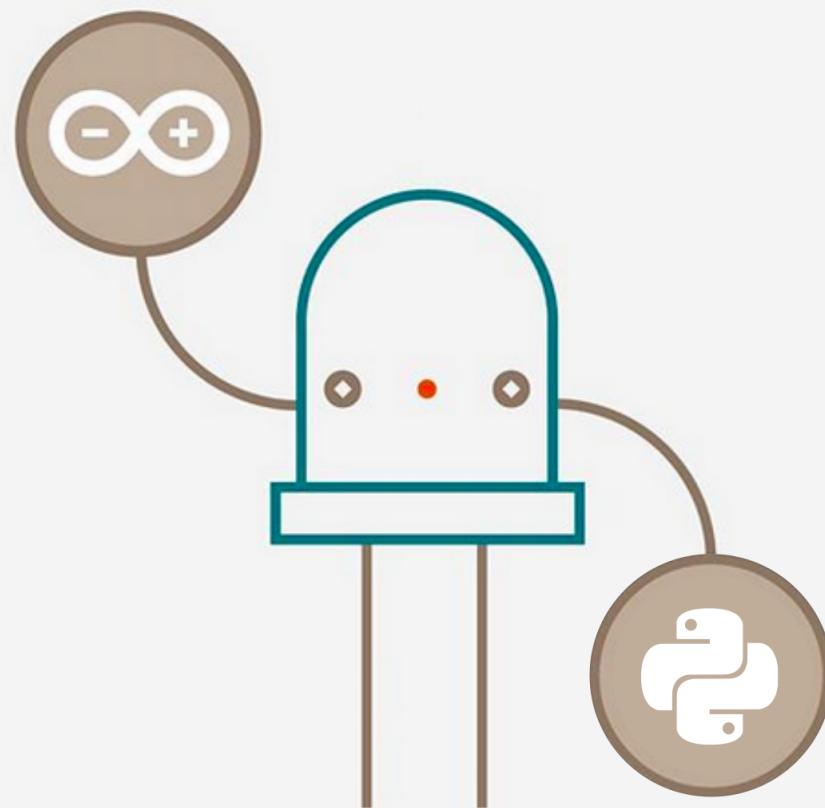


# "PROGRAMANDO" ARDUINO COM PYTHON





# ALEX AQUINO

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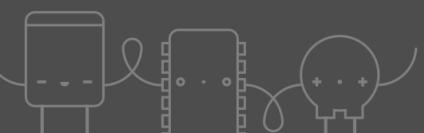
[github.com/alexaquino](https://github.com/alexaquino)





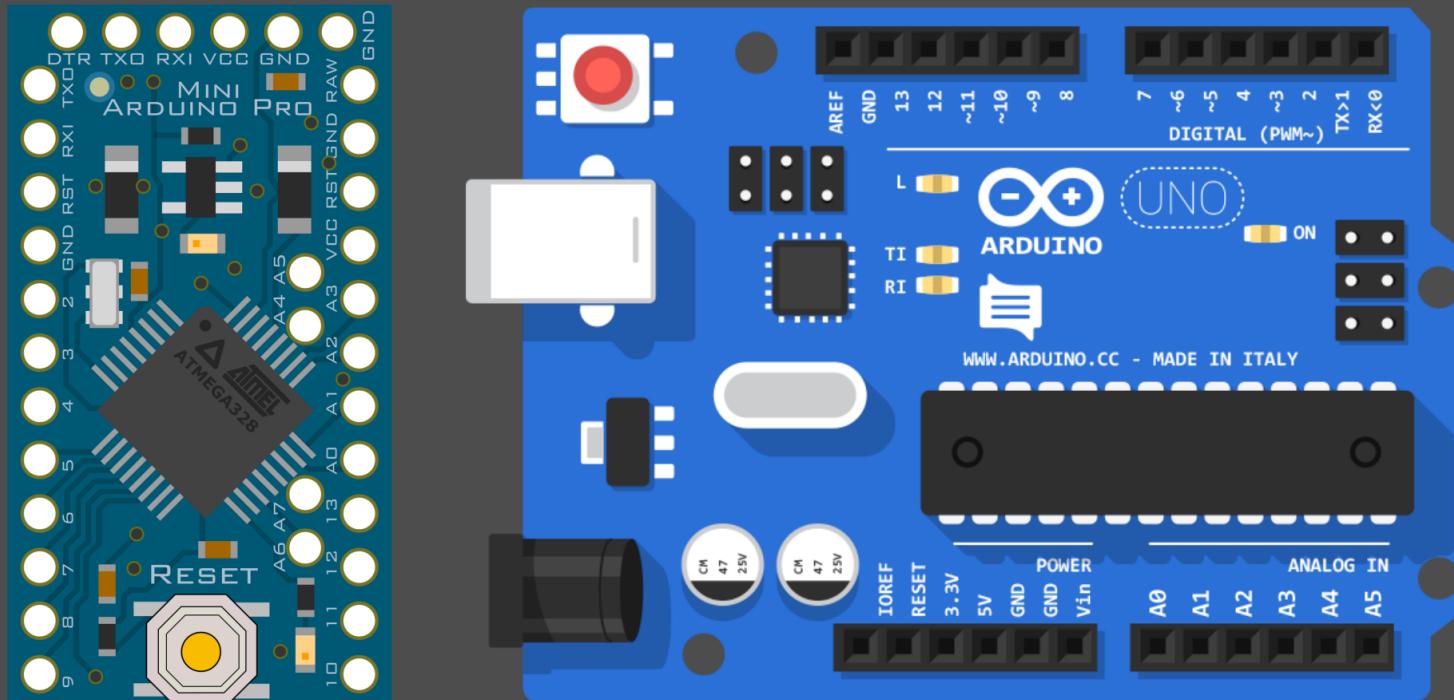
>\_ arduino com python?!

$$\text{Python} + \infty = \text{Love}$$





>\_ arduino?!

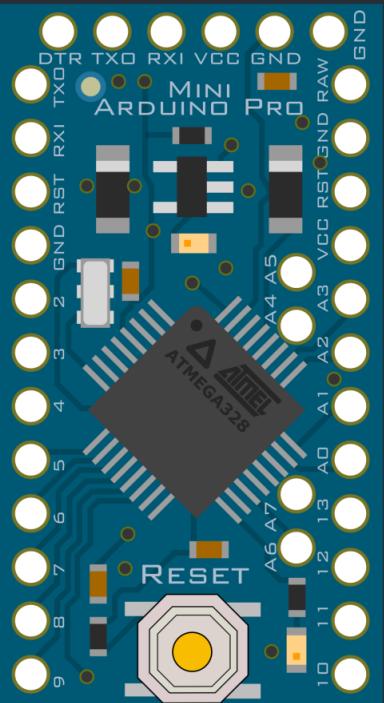


ATmega 328 - 16 MHz - 32KB Flash (sketch) - 2KB SRAM  
20 Pinos I/O: 14 Digitais (6 PWM) e 6 Analógicos

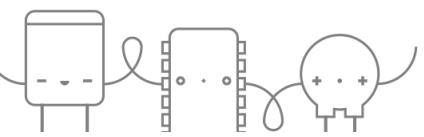
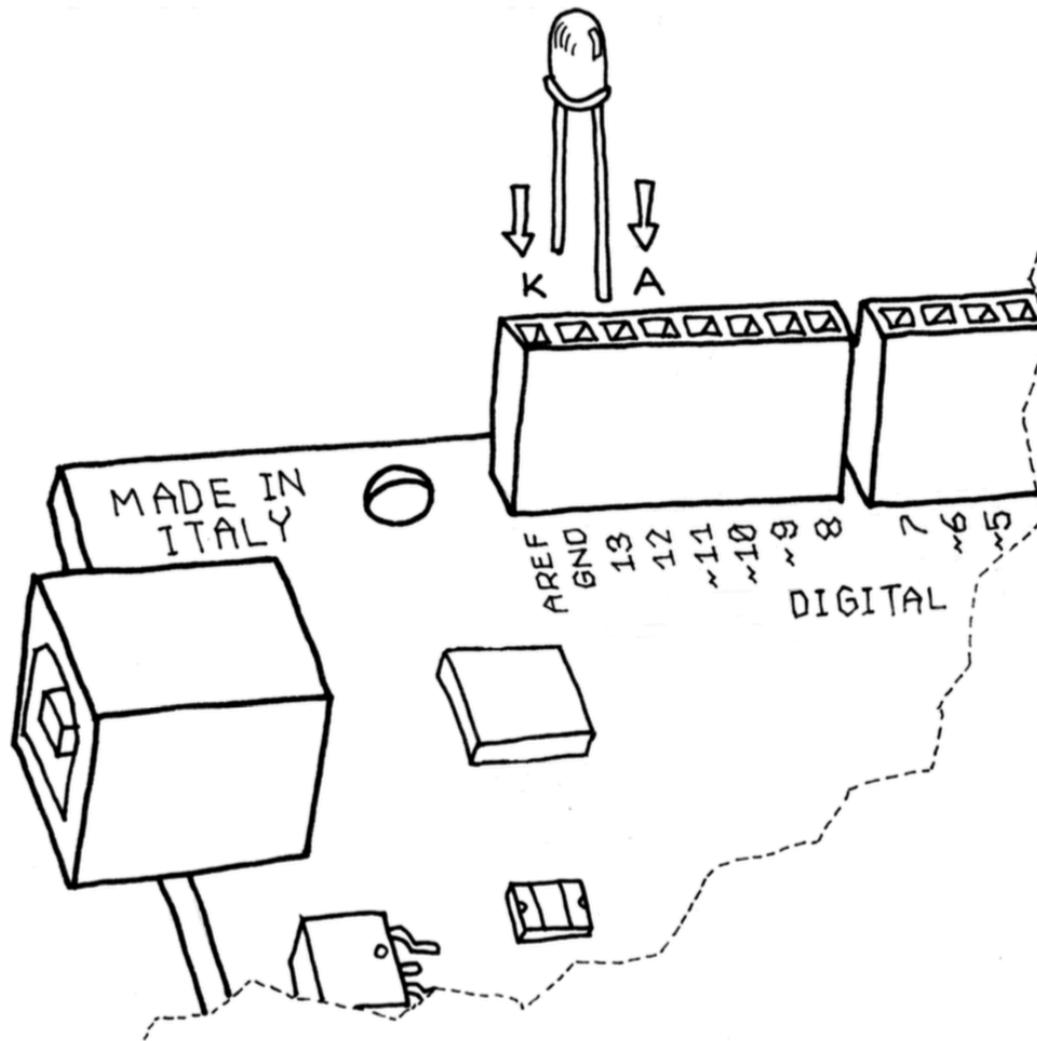




# >\_ arduino?!

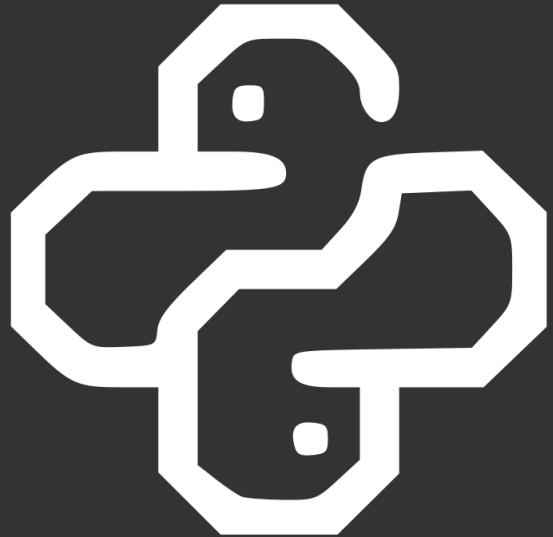


```
1 // the setup function runs once when you press reset or power the board
2
3 void setup() {
4     // initialize digital pin LED_BUILTIN as an output.
5     pinMode(LED_BUILTIN, OUTPUT);
6 }
7
8 // the loop function runs over and over again forever
9 void loop() {
10    digitalWrite(LED_BUILTIN, HIGH);
11    delay(1000);
12    digitalWrite(LED_BUILTIN, LOW);
13    delay(1000);
14 }
```

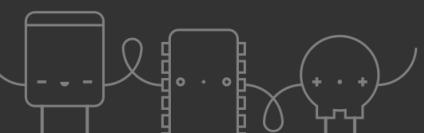




>\_ python?!



- Fácil de ler e entender;
- Permite prototipagem rápida;
- Reduz o tempo de desenvolvimento;
- Universo de bibliotecas;
- Comunidade gigantesca;
- Multiparadigma e Multiplataforma;
- Open Source...

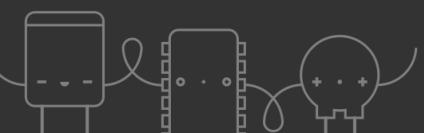




>\_ python?!



Imprimir "Hallo Welt"



```
1 #include <iostream>
2 using namespace std;
3
4 int main() {
5     cout << "Hallo Welt!" << endl;
6     system("pause");
7 }
```



```
1 public class HalloWelt {
2
3     public static void main(String[] args) {
4         System.out.println("Hallo Welt!");
5     }
6 }
```



```
1 print ("Hallo Welt!")
```



>\_ o que precisamos?



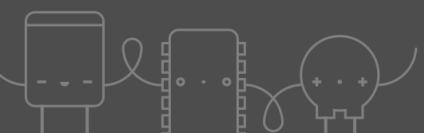
[python.org](http://python.org)



[arduino.cc](http://arduino.cc)

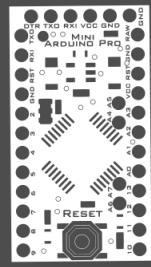


[pip.pypa.io](http://pip.pypa.io)    pip install pyfirmata





>\_ firmata?!



Firmata é um protocolo para comunicação com microcontroladores a partir de software em um computador (device).

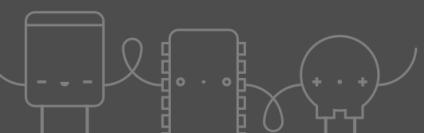




>\_ pyfirmata?!



**PyFirmata conversa com o Arduino via serial**  
você carrega a aplicação firmata no Arduino e depois utiliza o  
pyFirmata no PC para enviar "Comandos" para o Arduino





>\_ o que precisamos?



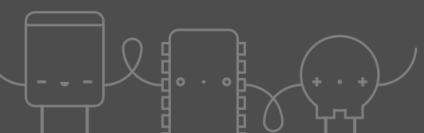
[python.org](http://python.org)



[arduino.cc](http://arduino.cc)



[pip.pypa.io](http://pip.pypa.io)    pip install pyfirmata





StandardFirmata

/\*  
Firmata is a g  
from software  
any host compu

To download a  
to open the li

<https://github.com/firmata/arduino#firmata-client>

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Copyright (C) 2010-2011 Paul Stoffregen. All rig  
Copyright (C) 2009 Shigeru Kobayashi. All rights  
Copyright (C) 2009-2016 Jeff Hoefs. All rights r

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Last updated August 17th, 2017

\*/

```
#include <Servo.h>
#include <Wire.h>
#include <Firmata.h>
```

```
#define I2C_WRITE      B00000000
#define I2C_READ       B00001000
#define I2C_READ_CONTINUOUSLY B00010000
#define I2C_STOP_READING B00011000
#define I2C_READ_WRITE_MODE_MASK B00011000
#define I2C_10BIT_ADDRESS_MODE_MASK B00100000
#define I2C_END_TX_MASK    B01000000
#define I2C_STOP_TX        1
#define I2C_RESTART_TX     0
```

Carregado.

O sketch usa 12602 bytes (41%) de espaço de armazen  
Variáveis globais usam 1103 bytes (53%) de memória d  
/Users/alexaquino/Documents/GitHub/Palestras\_Ministr

- Novo ⌘N
- Abrir... ⌘O
- Abrir Recente
- Sketchbook
- Exemplos
- Fechar ⌘W
- Salvar ⌘S
- Salvar como... ⌘⌘S
- Configuração da página ⌘⌘P
- Imprimir ⌘P

- Exemplos embutidos
  - 01.Basics
  - 02.Digital
  - 03.Analog
  - 04.Communication
  - 05.Control
  - 06.Sensors
  - 07.Display
  - 08.Strings
  - 09.USB
  - 10.StarterKit\_BasicKit
  - 11.ArduinoISP
- Exemplos para qualquer placa
  - Bridge
  - Esploра
  - Ethernet
  - Firmata
  - GSM
  - LiquidCrystal
  - SD
  - Servo
  - SpacebrewYun
  - Stepper
  - Temboo
  - TFT
  - WiFi
- Exemplos para Arduino Nano
  - EEPROM
  - SoftwareSerial
  - SPI
  - Wire
- Exemplos de Bibliotecas Personalizadas
  - Adafruit Circuit Playground
  - Bounce2
  - Robot Control
  - Robot Motor

StandardFirmata | Arduino 1.8.1

- AllInputsFirmata
- AnalogFirmata
- EchoString
- OldStandardFirmata
- ServoFirmata
- SimpleAnalogFirmata
- SimpleDigitalFirmata
- StandardFirmata
- StandardFirmataBLE
- StandardFirmataChipKIT
- StandardFirmataEthernet
- StandardFirmataPlus
- StandardFirmataWiFi
- test

...









# ALEX AQUINO



/alexaquino\_it



/alexaquino.it



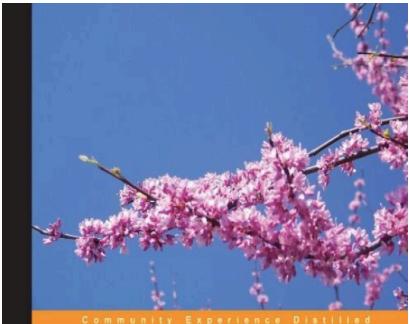
/alexaquino



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Referência:



**Python Programming  
for Arduino**

Develop practical Internet of Things prototypes and applications  
with Arduino and Python