Arduino Básico

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Heitor Rapela

https://github.com/heitorrapela/ArduinoWorkshop


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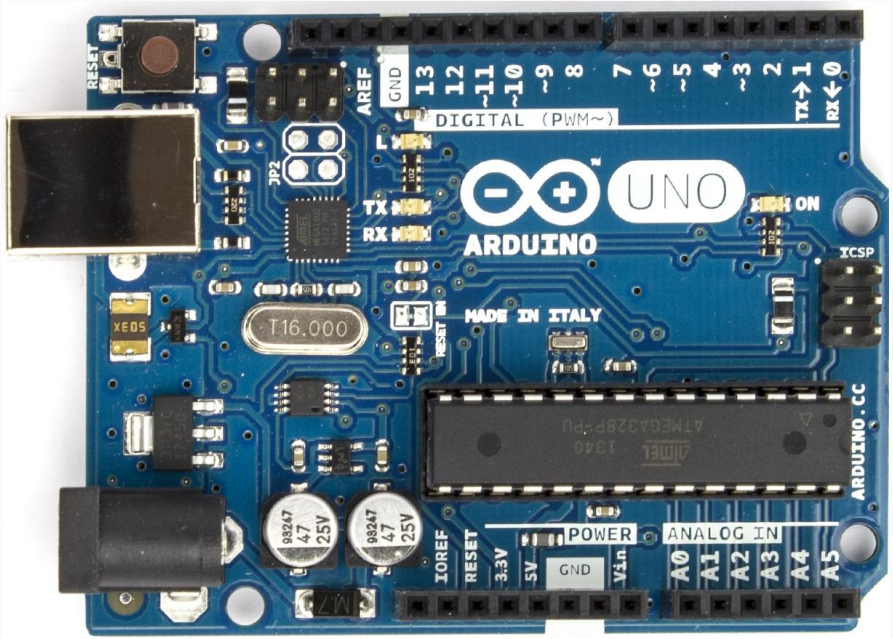
/heitorrapela

O que é Arduino




```
/*
  Blink
  Turns on an LED on for one second, then off for one secc

  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

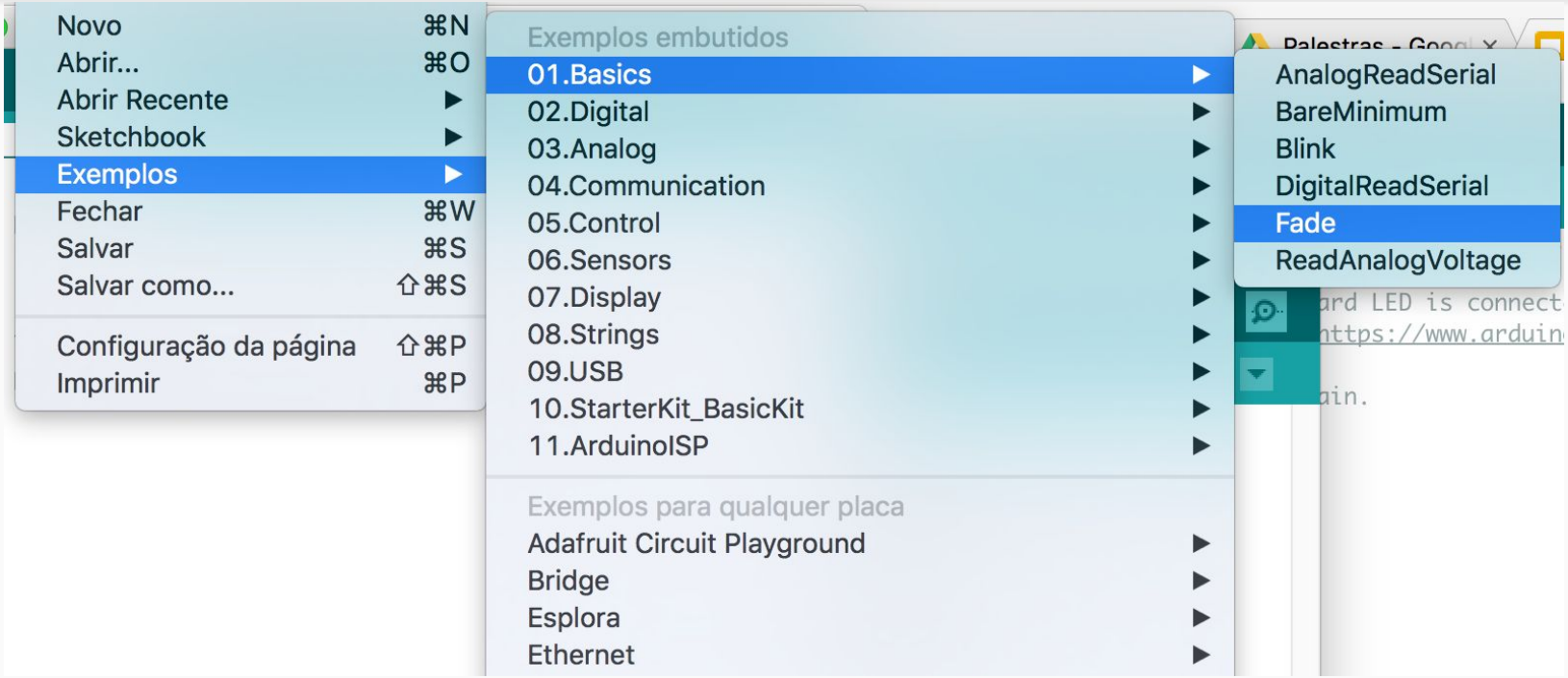
Arduino Fio

Instalação da IDE

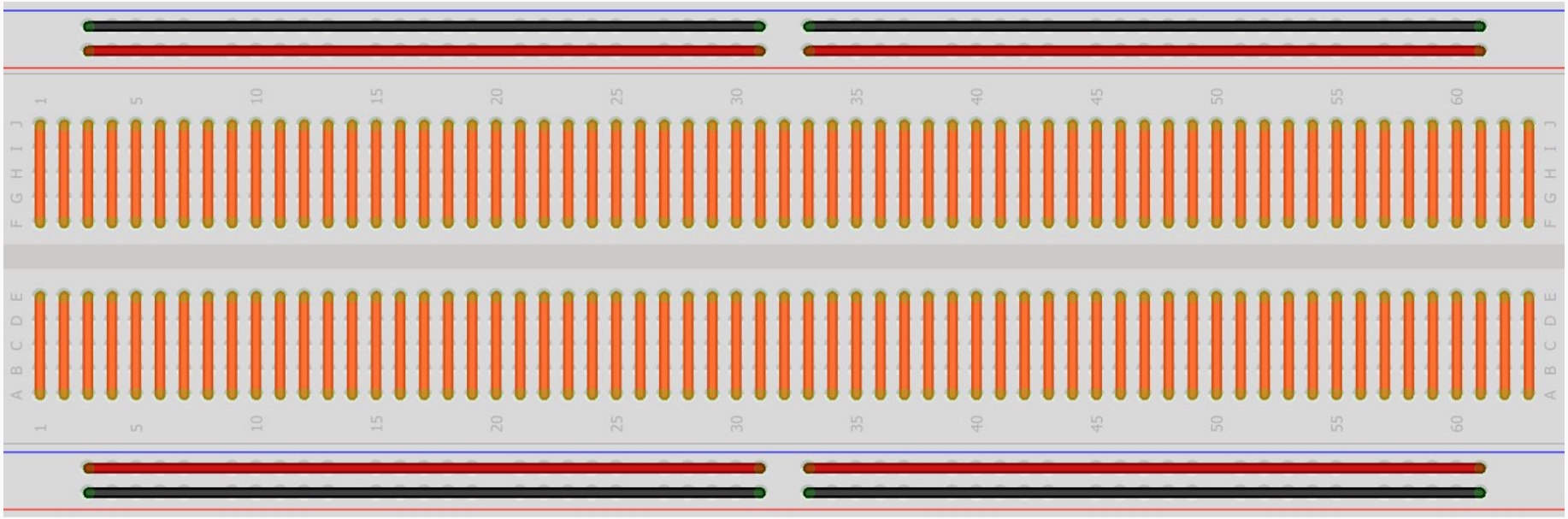
https://www.arduino.cc/en/Main/Software

$ sudo apt-get install arduino

Exemplos

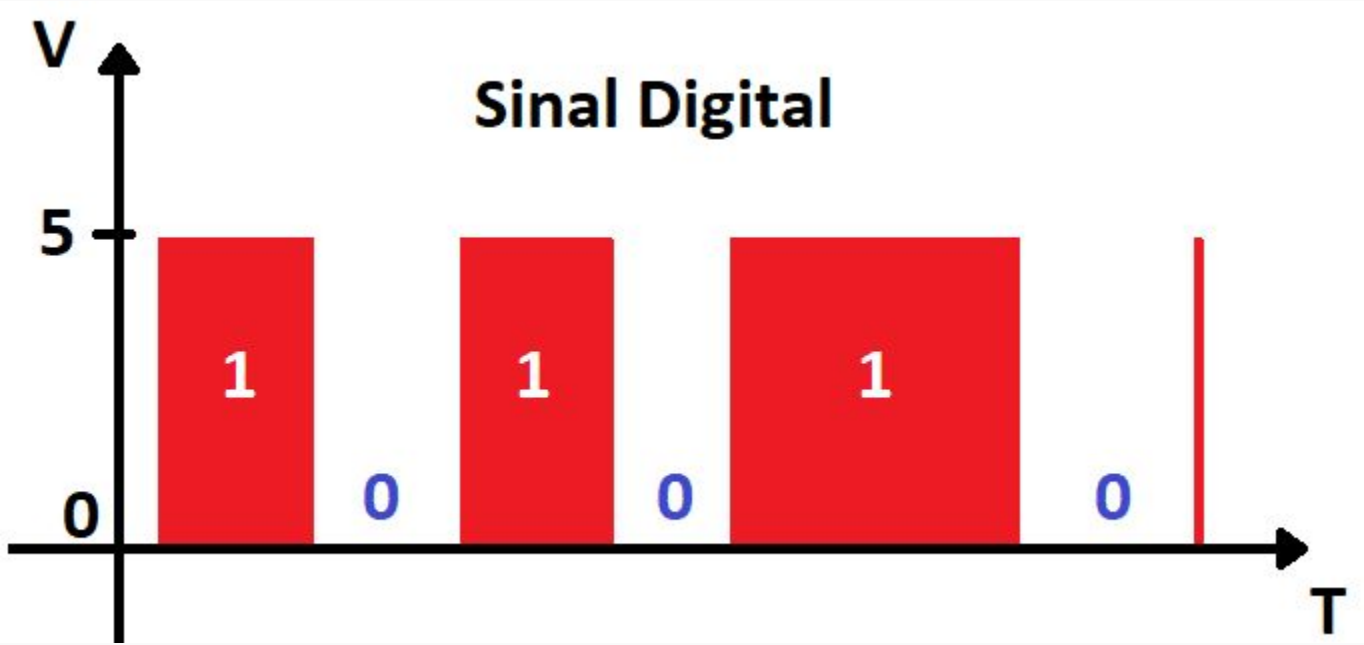

Novo ⌘N
Abrir... ⌘O
Abrir Recente ▶
Sketchbook ▶
Exemplos ▶
Fechar ⌘W
Salvar ⌘S
Salvar como... ⇧⌘S
Configuração da página ⇧⌘P
Imprimir ⌘P
Exemplos embutidos
01.Basics ▶
02.Digital ▶
03.Analog ▶
04.Communication ▶
05.Control ▶
06.Sensors ▶
07.Display ▶
08.Strings ▶
09.USB ▶
10.StarterKit_BasicKit ▶
11.ArduinoISP ▶
Exemplos para qualquer placa
Adafruit Circuit Playground ▶
Bridge ▶
Esplora ▶
Ethernet ▶
AnalogReadSerial
BareMinimum
Blink
DigitalReadSerial
Fade
ReadAnalogVoltage

Protoboard

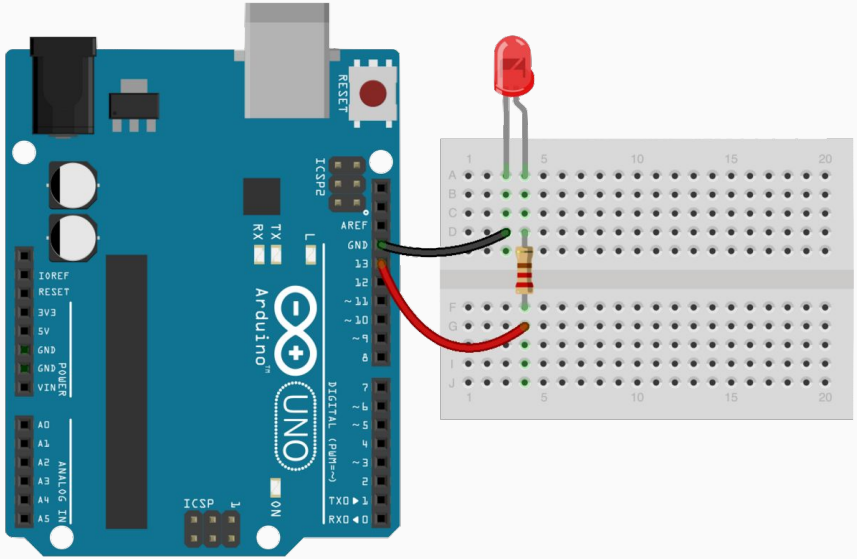


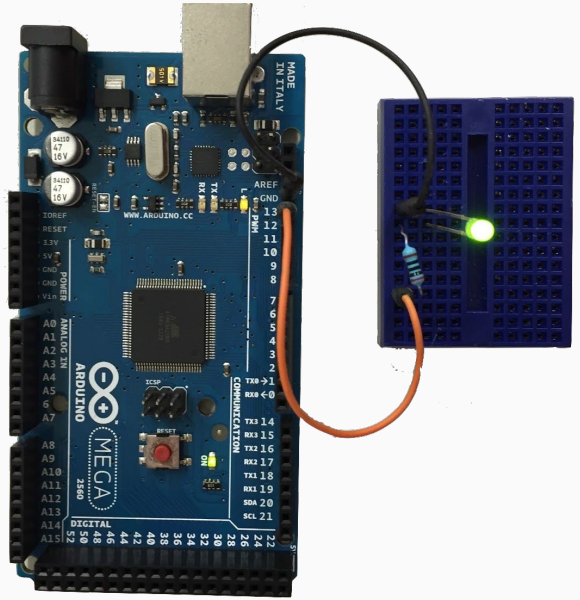
Sinal Digital

Sinal digital



Conectando um LED



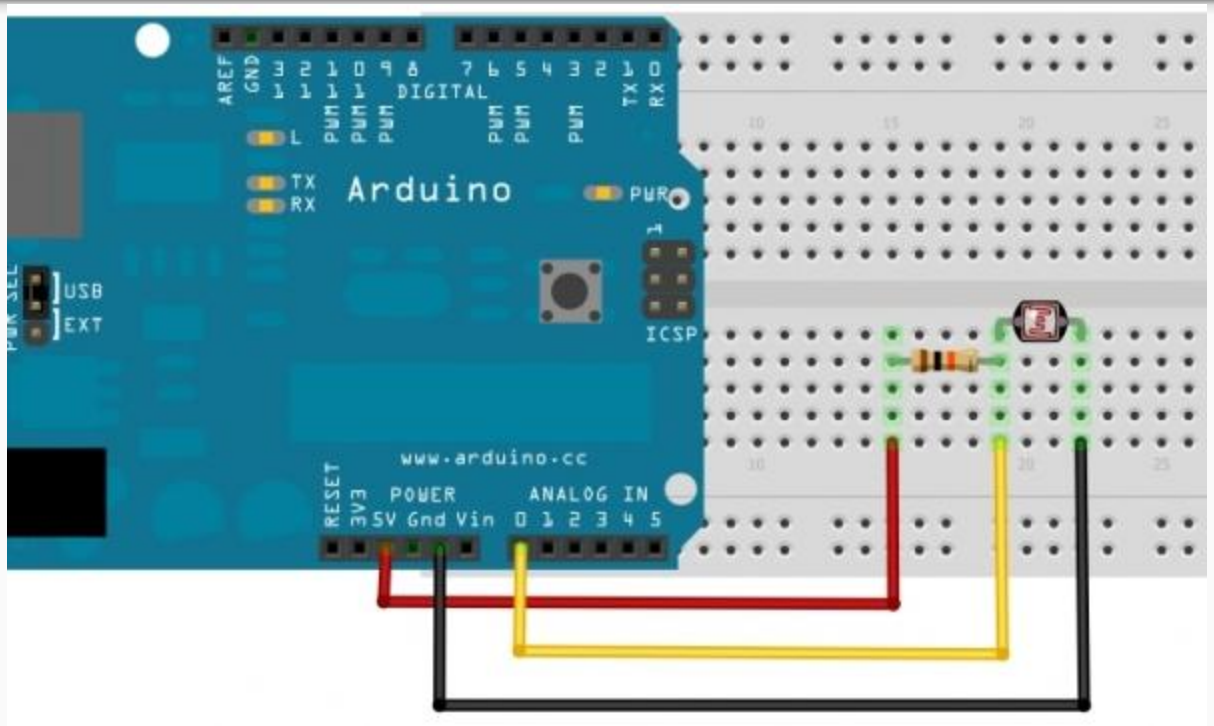


Acionando um LED (Blink)

```
// the setup function runs once when you press reset or power the board
void setup() {
  // initialize digital pin LED_BUILTIN as an output.
  pinMode(LED_BUILTIN, OUTPUT);
}

// the loop function runs over and over again forever
void loop() {
  digitalWrite(LED_BUILTIN, HIGH);   // turn the LED on (HIGH is the voltage level)
  delay(1000);                       // wait for a second
  digitalWrite(LED_BUILTIN, LOW);    // turn the LED off by making the voltage LOW
  delay(1000);                       // wait for a second
}
```

Entrada analógica

Conectando um LDR

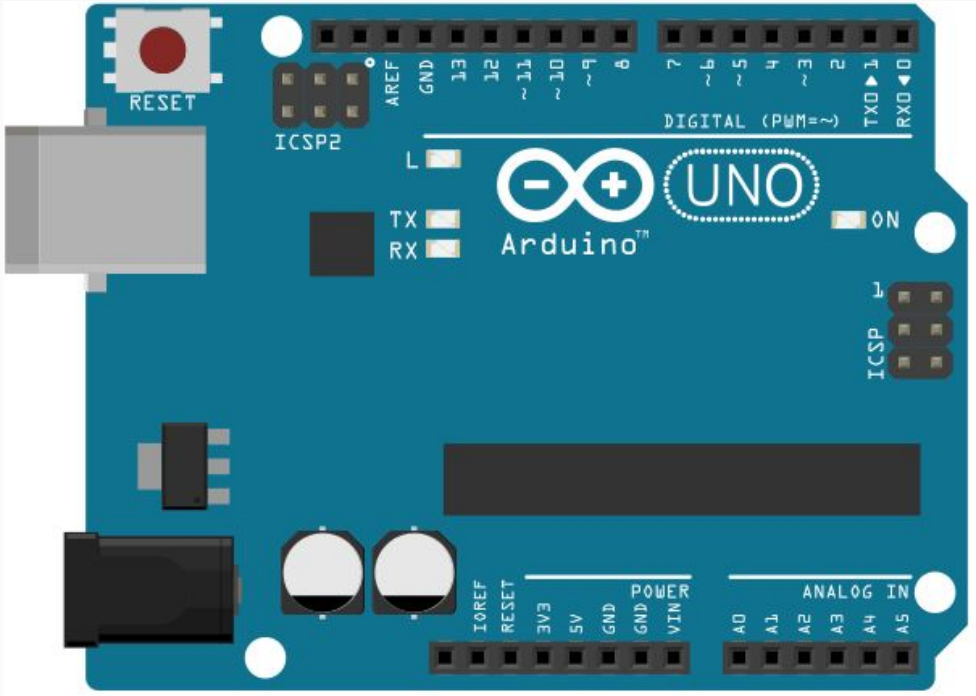


Leitura Analógica (AnalogReadSerial)

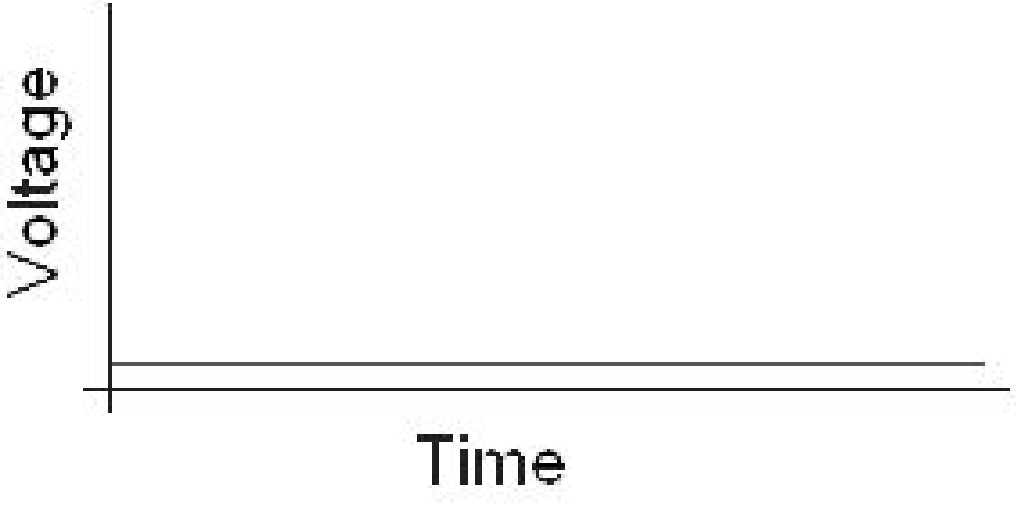
```
// the setup routine runs once when you press reset:
void setup() {
  // initialize serial communication at 9600 bits per second:
  Serial.begin(9600);
}

// the loop routine runs over and over again forever:
void loop() {
  // read the input on analog pin 0:
  int sensorValue = analogRead(A0);
  // print out the value you read:
  Serial.println(sensorValue);
  delay(1);        // delay in between reads for stability
}
```

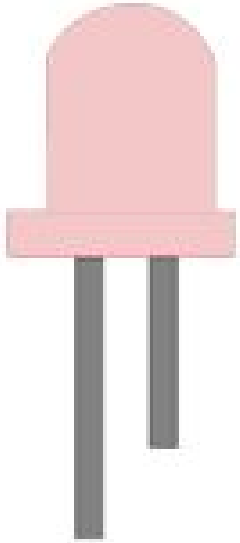
“Saída Analógica”

Portas PWM


RESET
ICSP2
AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM=~)
L
TX
RX
UNO
Arduino™
ON
ICSP
POWER
IOREF
RESET
3V3
5V
GND
GND
VIN
ANALOG IN
A0
A1
A2
A3
A4
A5

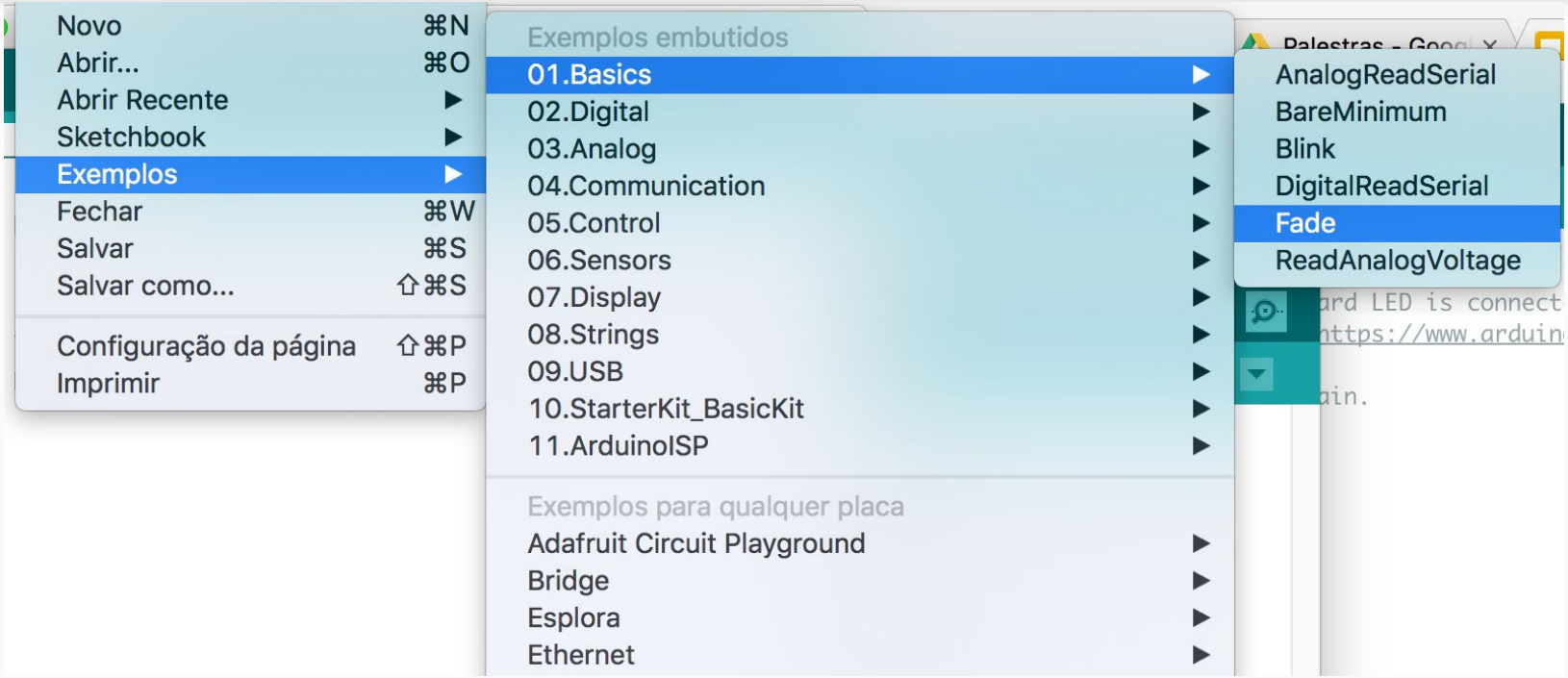
Funcionamento PWM





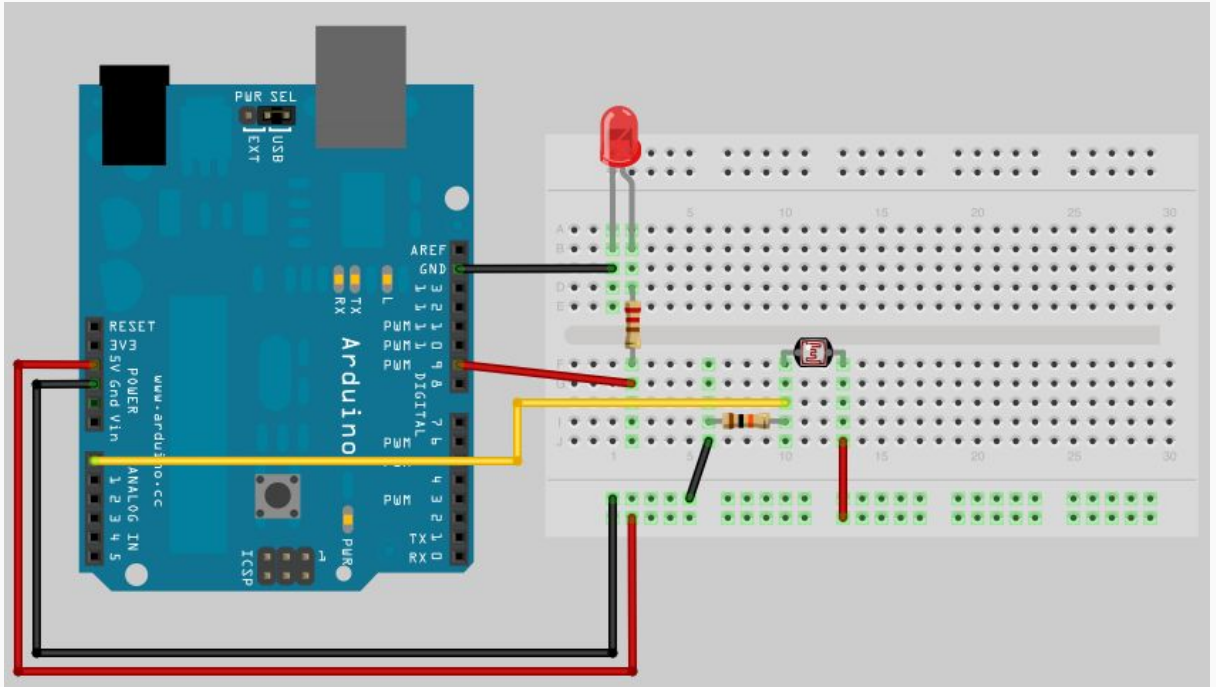
Duty Cycle: 0%

Exemplos com PWM



Acionando LED com PWM

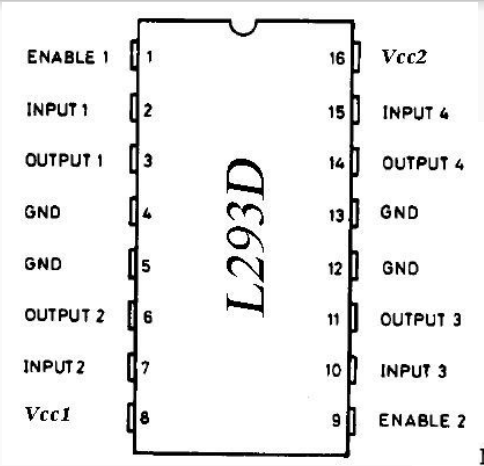
Conectando um Led e LDR



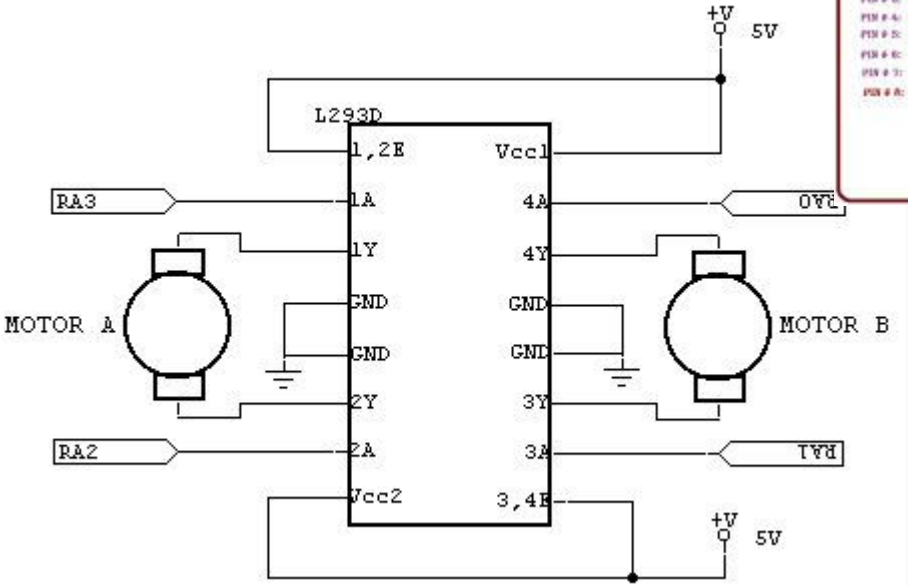
Tensão e corrente de funcionamento

	Arduino	**LED**	**Motor**
Tensão	5 V	1.8-2.0 V	6 V
Corrente	40 mA	20 mA	120 mA

Ponte-H


ENABLE 1
INPUT 1
OUTPUT 1
GND
GND
OUTPUT 2
INPUT 2
Vcc1
1
2
3
4
5
6
7
8
L293D
16
15
14
13
12
11
10
9
Vcc2
INPUT 4
OUTPUT 4
GND
GND
OUTPUT 3
INPUT 3
ENABLE 2

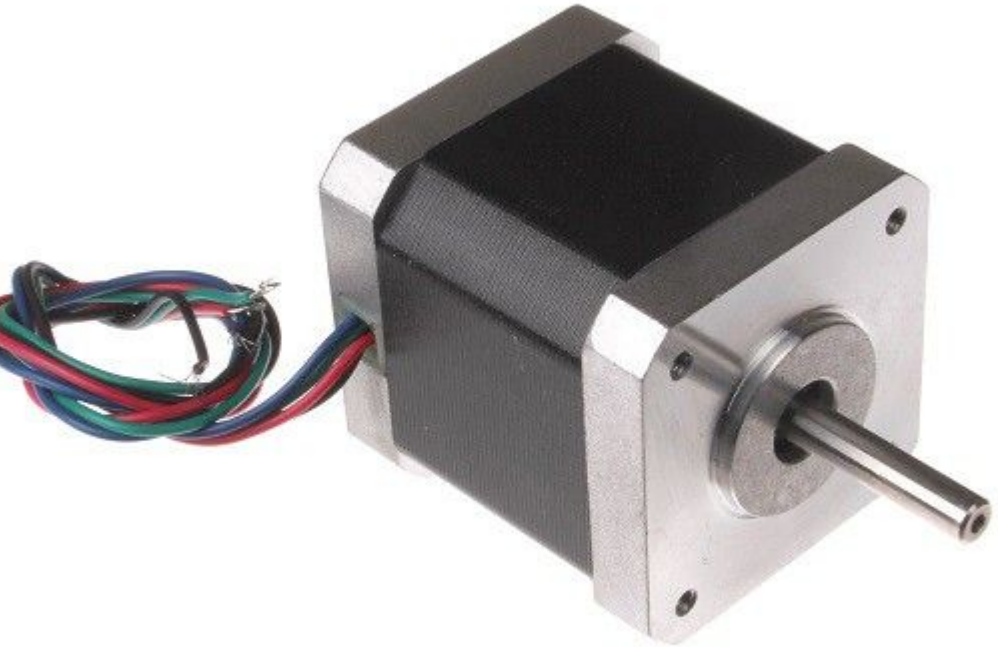

L293D Pinout
L293D Animation
L293D IC
www.TheEngineeringProjects.com


+V
5V
L293D
1,2E
Vcc1
RA3
1A
4A
OUT
1Y
4Y
GND
GND
GND
GND
MOTOR A
MOTOR B
2Y
3Y
RA2
2A
3A
RA1
Vcc2
3,4E
+V
5V

Tipos de Motor

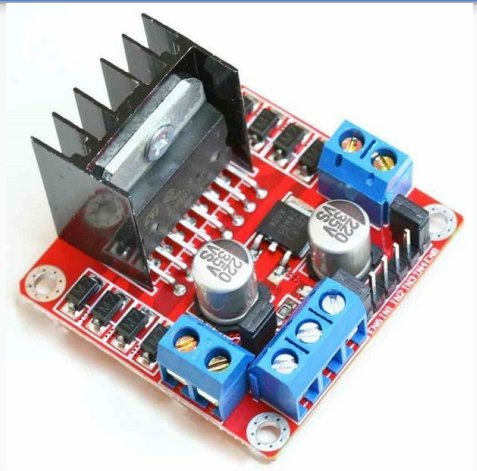
Motor DC

Motor de Passo



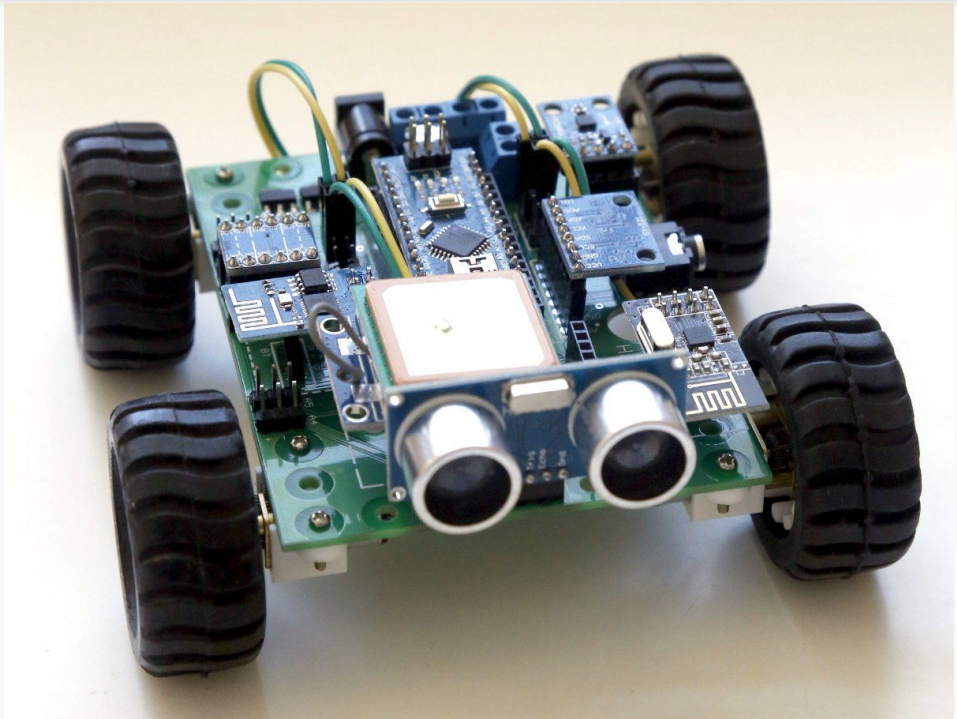
Servomotor

Motor com Driver

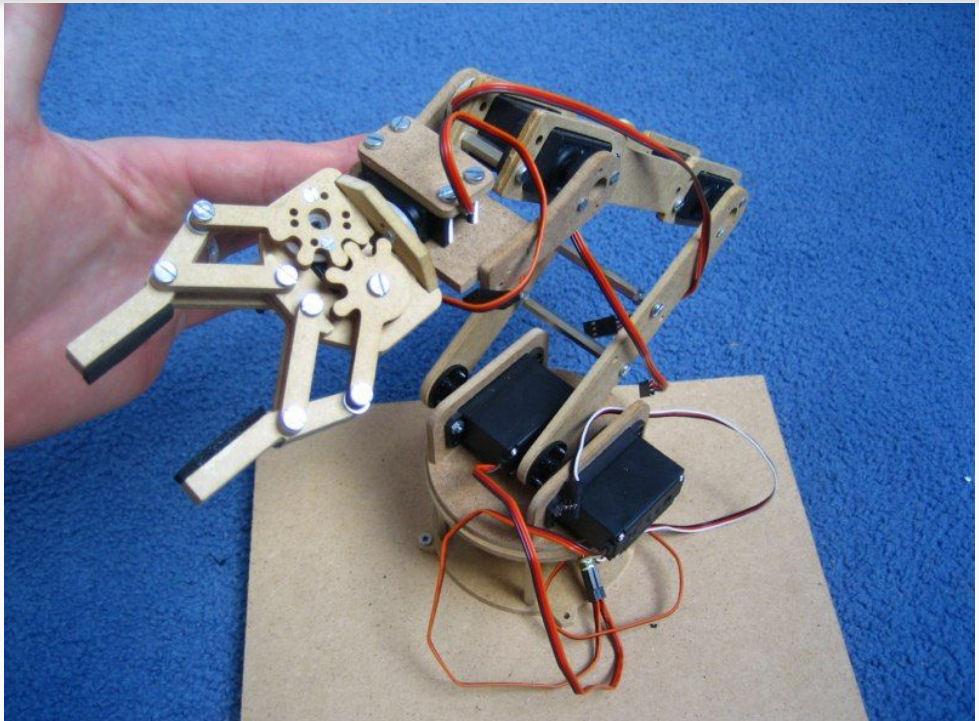


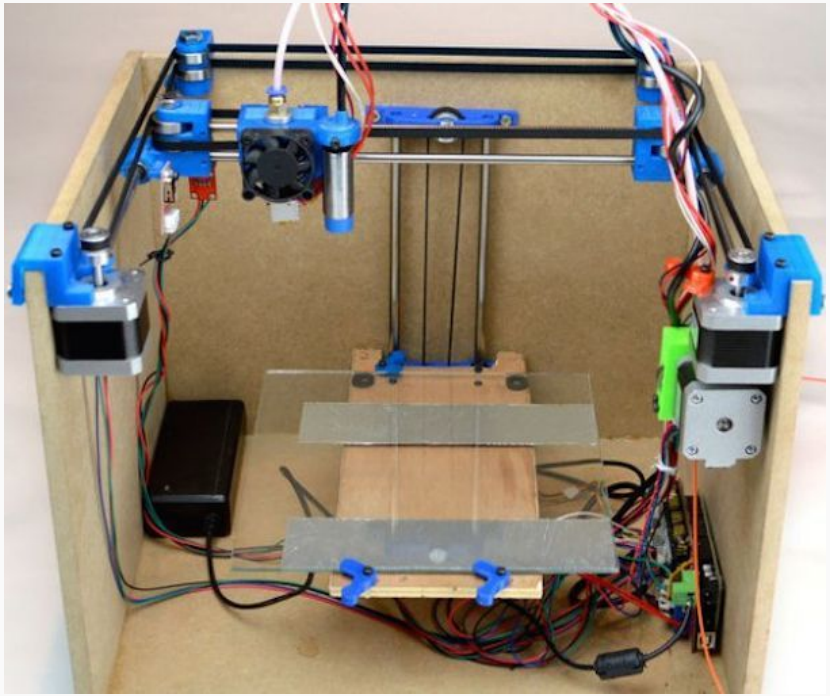
Montagem do Robô

Robôs com Arduinos

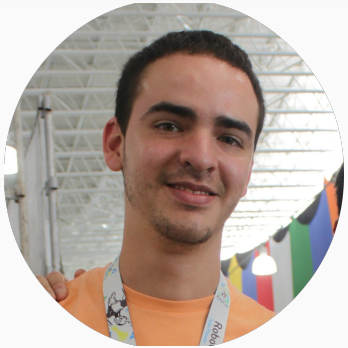


Robôs com Arduinos





Obrigado



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/heitorrapela

Extra

Extra - Interface com Python

https://playground.arduino.cc/Interfacing/Python

https://www.embarcados.com.br/python-e-arduino-comunicacao-serial/

https://pt.linkedin.com/pulse/programando-arduino-em-python-pyfirmata-wellington-c-faria

https://pypi.python.org/pypi/pyFirmata