ARDUINO DAY 2019

Simulação de circuitos com Tinkercad

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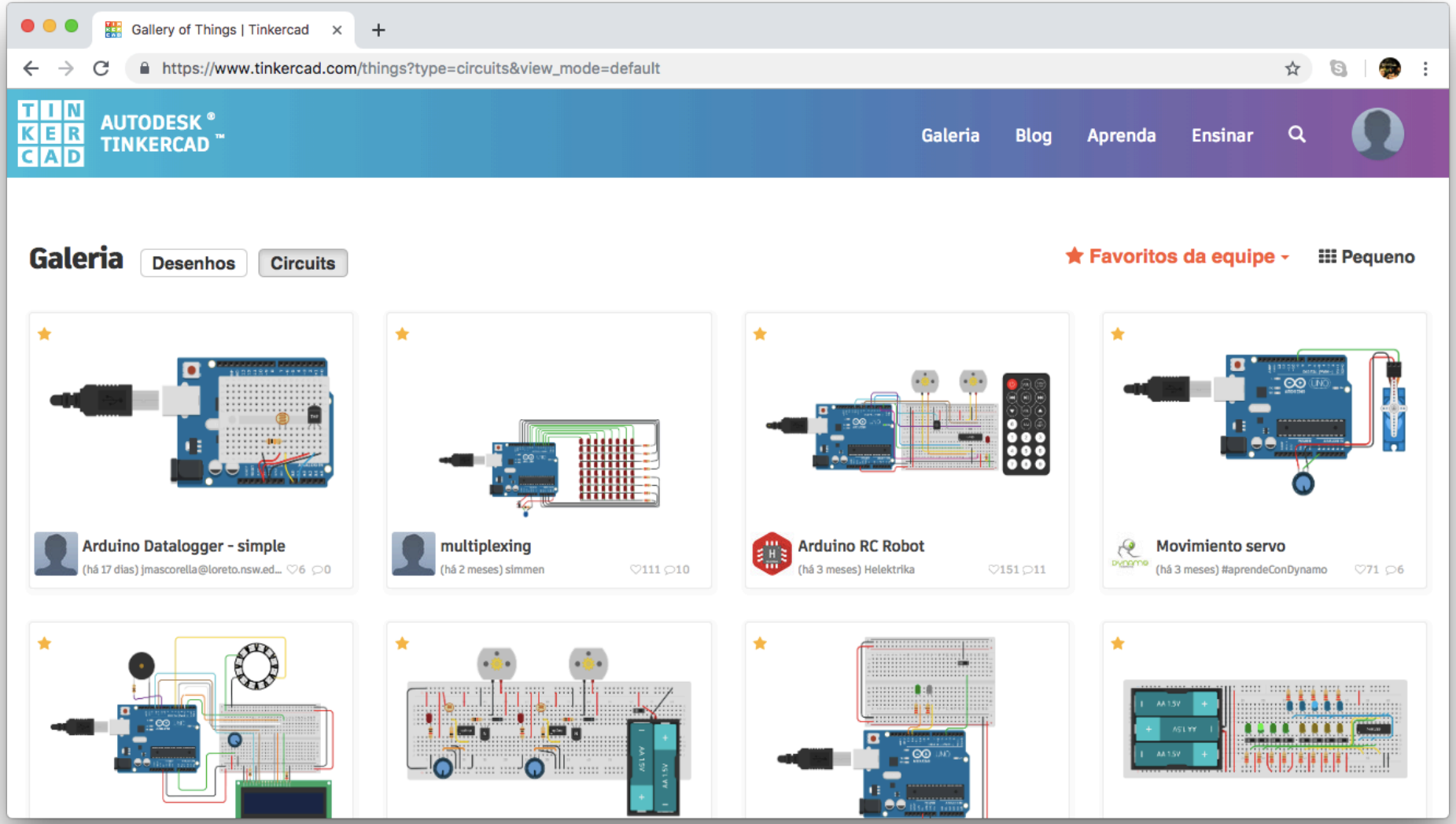
Março/2019

github.com/fkuhne/aday19

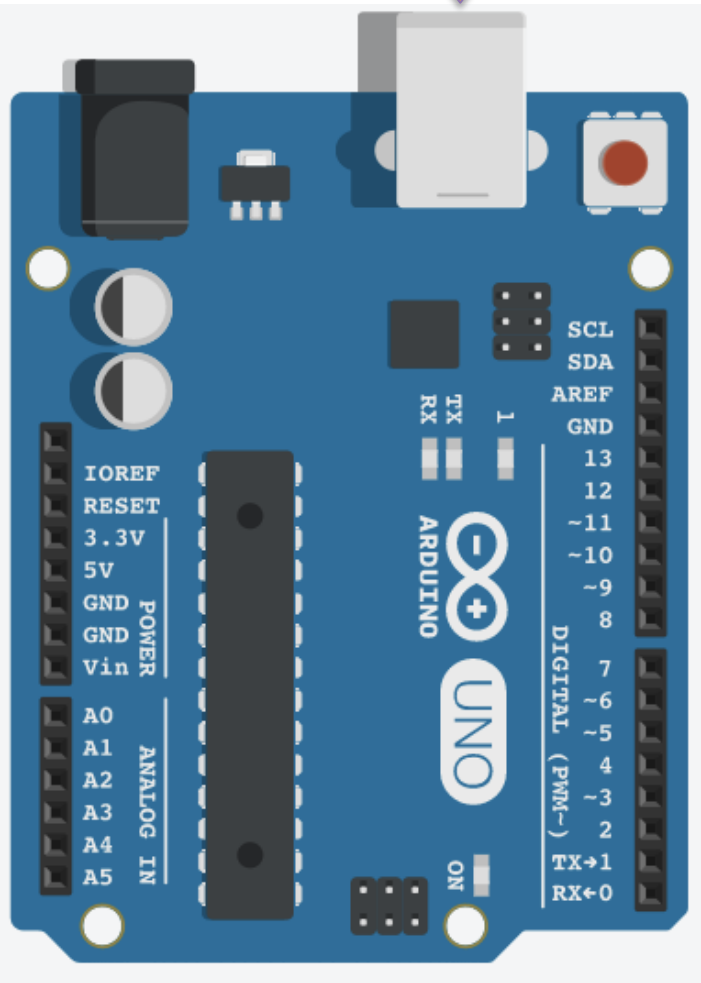
https://youtu.be/WynYhZx_qds

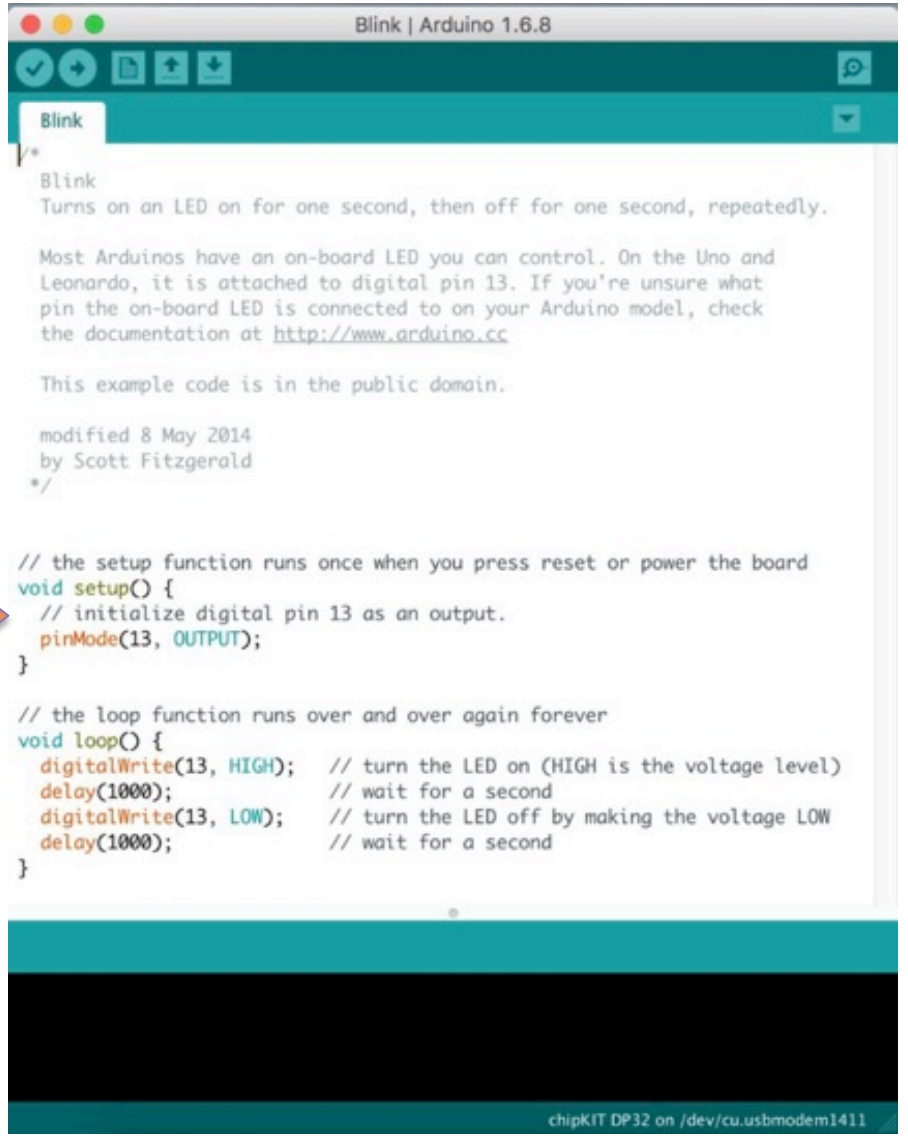
https://www.tinkercad.com



Nosso cenário

USB PC





Dashboard | Tinkercad

Felipe

Secure | https://www.tinkercad.com/#/?type=circuits&collection=designs

TINKERCAD FOR... GALERIA COMMUNITY APRENDA ENSINAR

fkuhne

Pesquisar projetos...

Desenhos

Circuits

Lições

Projetos

Criar projeto

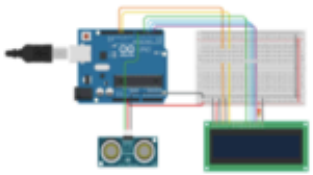
Tweets Seguir

Tinkercad
@tinkercad

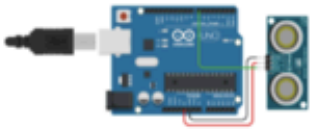
Enter the Design for Space Travel challenge to create an inventive spacecraft using @tinkercad !

Circuits

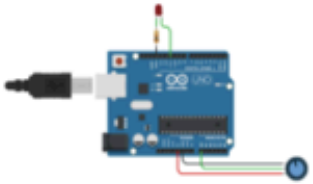
Create new Circuit



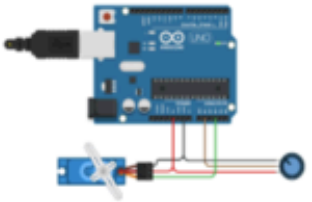
LCD e sensor ultrassônico
há 2 minutos
Público
♡0 ◯0



Sensor ultrassônico
há 21 minutos
Público
♡0 ◯0

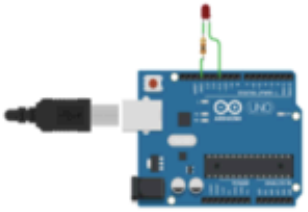


Entrada e saída analógicas
há 44 minutos
Público
♡0 ◯0

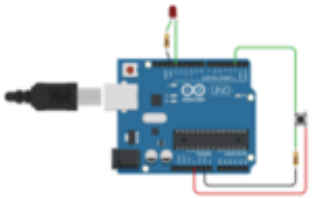


Potenciômetro e servo
há uma hora
Público
♡0 ◯0

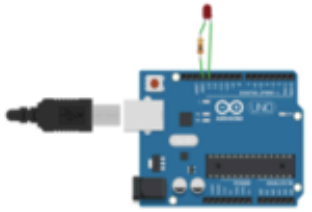
Entrada analógica
há 2 horas



Blink Analógico
há 2 horas



Botão e led
há 3 horas

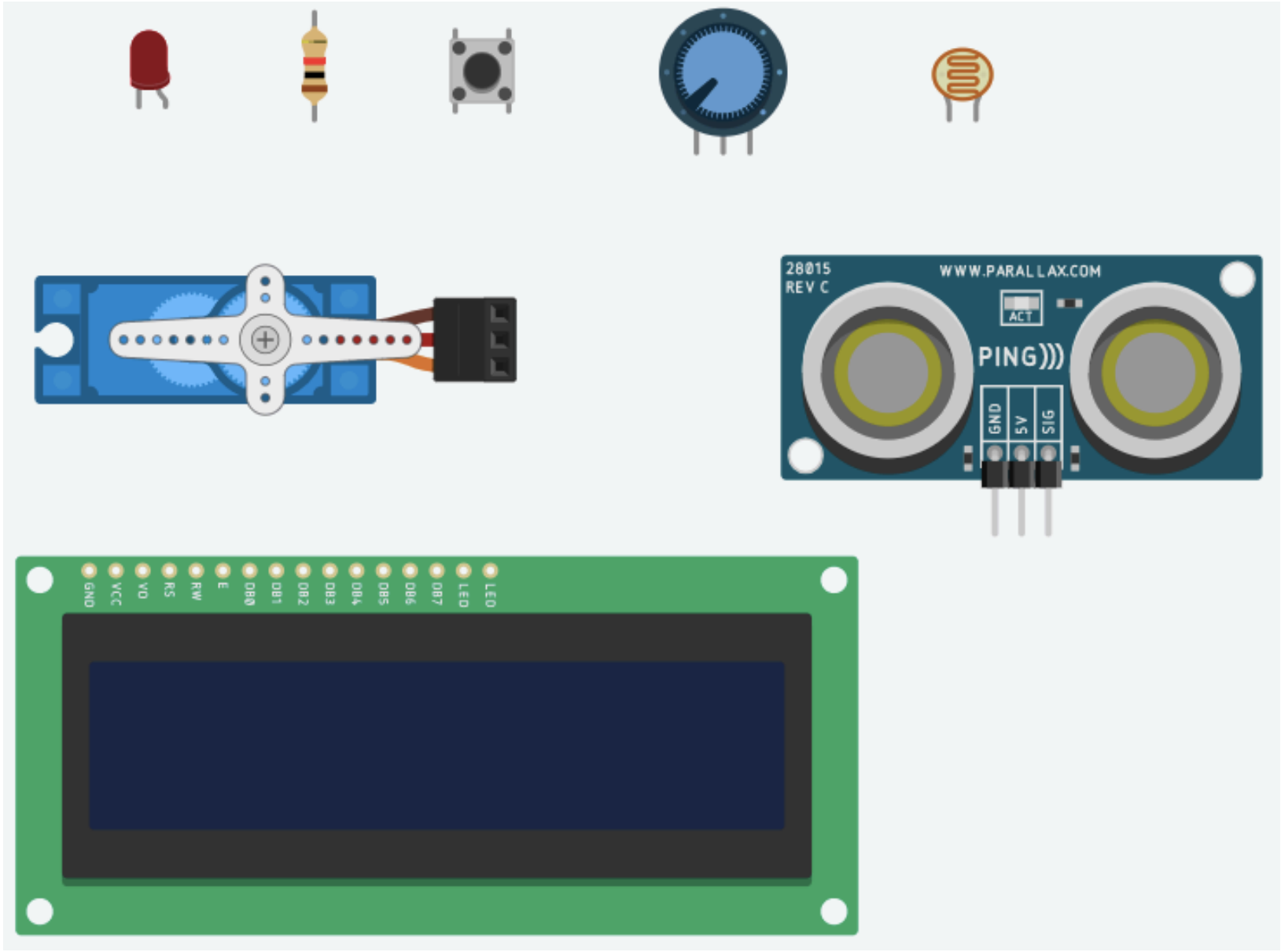


Blink
há 3 horas

Funções básicas

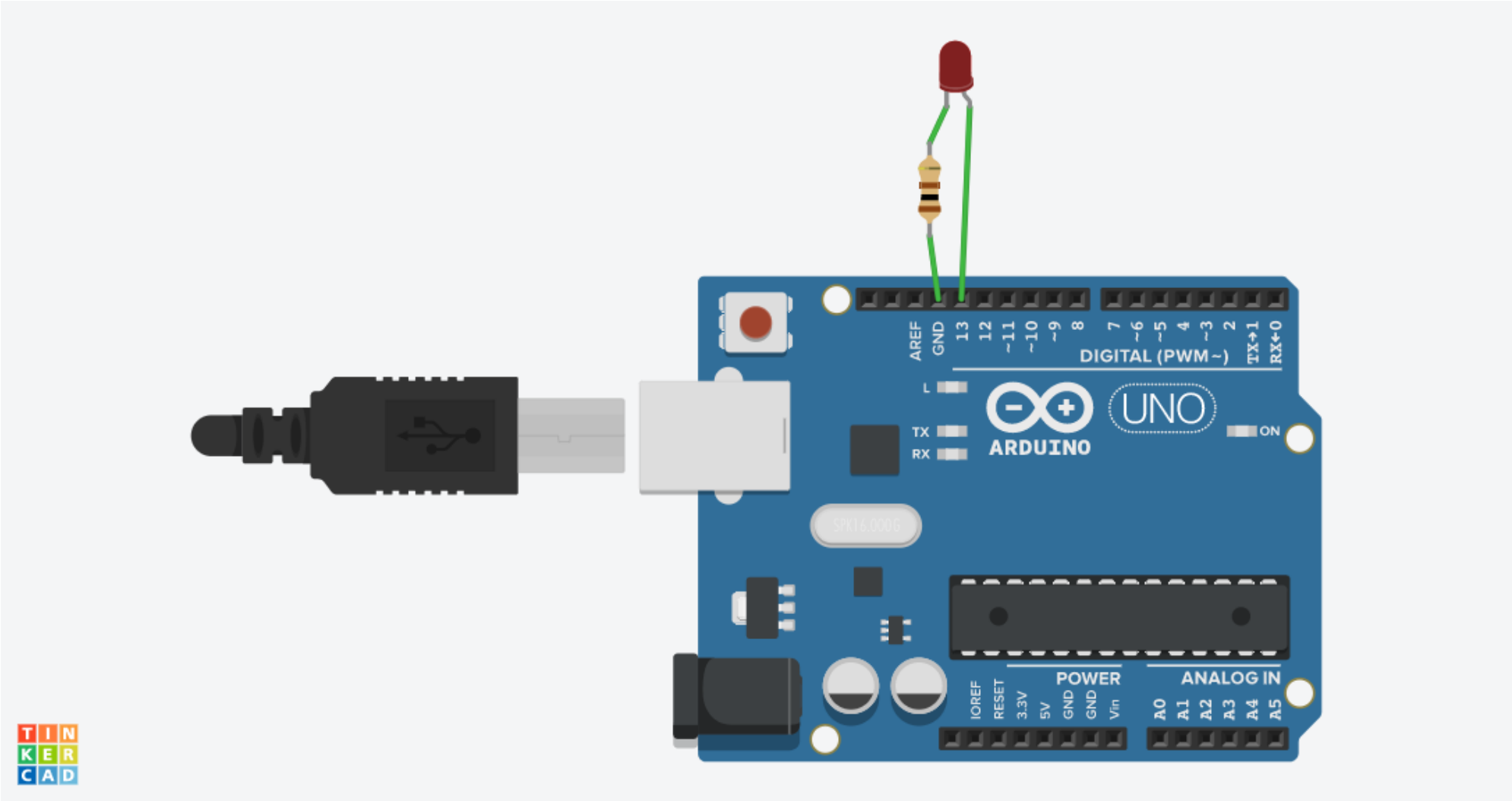
- pinMode()
- digitalWrite()
- digitalRead()
- delay()
- analogWrite()
- analogRead()
- Classe Serial
- Outras libs...

Componentes básicos



SCL
SDA
AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM~)
L
TX
RX
ARDUINO
UNO
ON
IOREF
RESET
3.3V
5V
GND
GND
Vin
POWER
A0
A1
A2
A3
A4
A5
ANALOG IN

Blink


AREF
GND
13
12
~11
~10
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8
7
~6
~5
4
~3
2
TX→1
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DIGITAL (PWM~)
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ARDUINO
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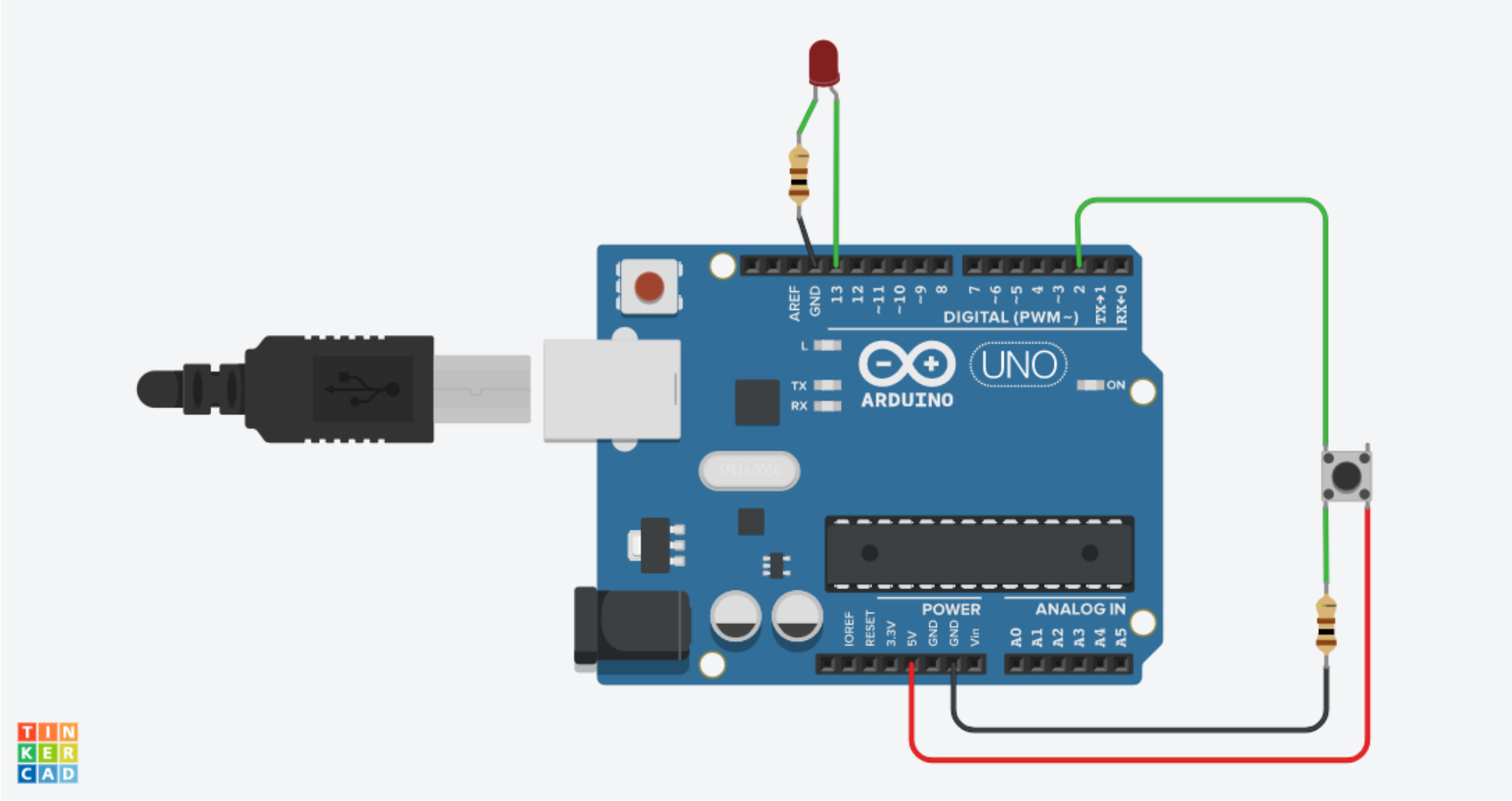
ANALOG IN
IOREF
RESET
3.3V
5V
GND
GND
Vin
A0
A1
A2
A3
A4
A5

Blink

```
1  void setup()
2  {
3    pinMode(13, OUTPUT);
4  }
5
6  void loop()
7  {
8    digitalWrite(13, HIGH);
9    delay(1000);
10   digitalWrite(13, LOW);
11   delay(1000);
12 }
```

Botão e LED


AREF
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TX→1
RX←0
DIGITAL (PWM~)
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TX
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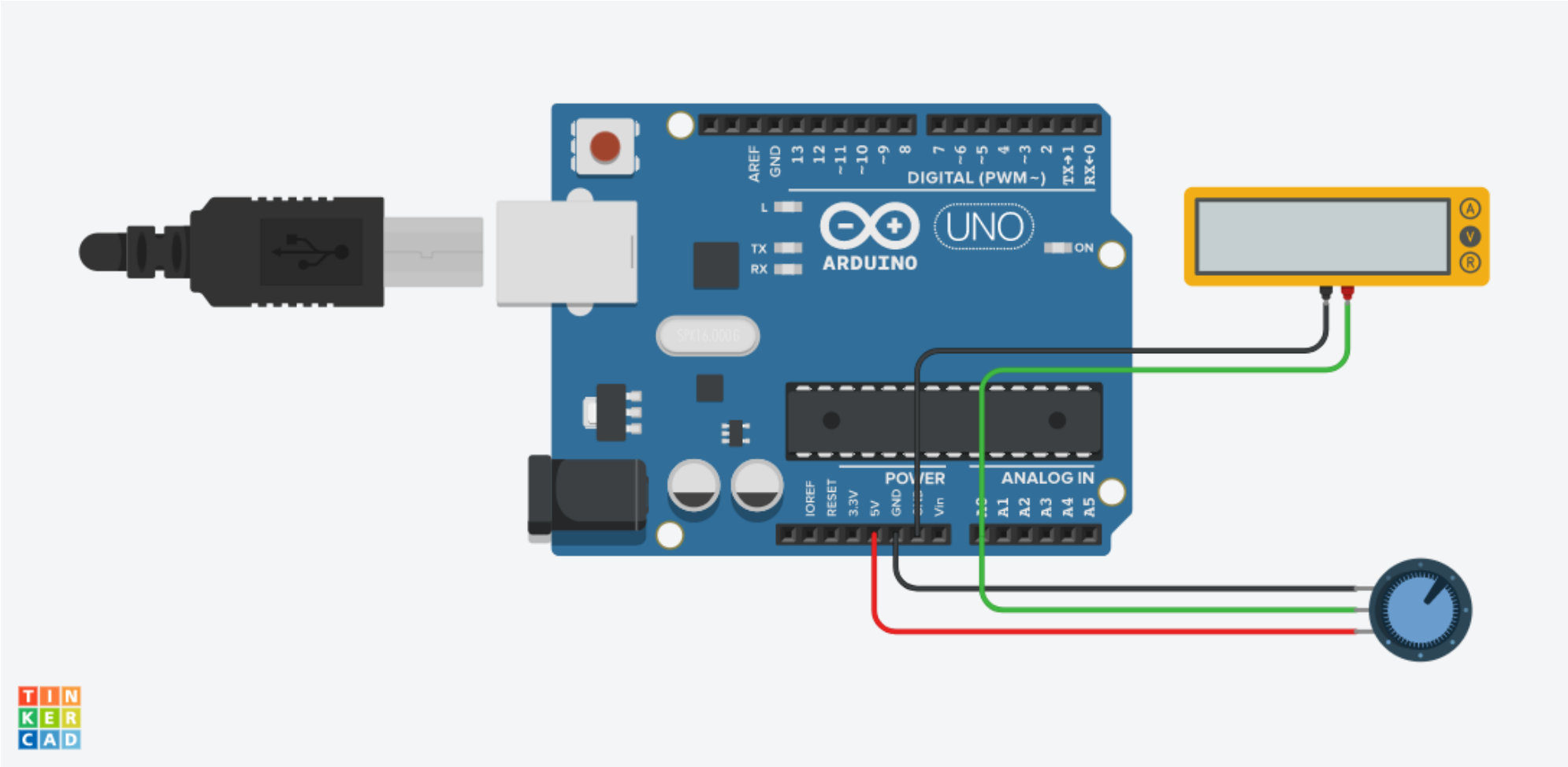
ARDUINO
UNO
ON
POWER
ANALOG IN
IOREF
RESET
3.3V
5V
GND
GND
Vin
A0
A1
A2
A3
A4
A5
TIN
KER
CAD

Botão e LED

```
1  void setup()
2  {
3    pinMode(2, INPUT);
4    pinMode(13, OUTPUT);
5  }
6
7  void loop()
8  {
9    bool state = digitalRead(2);
10   digitalWrite(13, state);
11 }
```

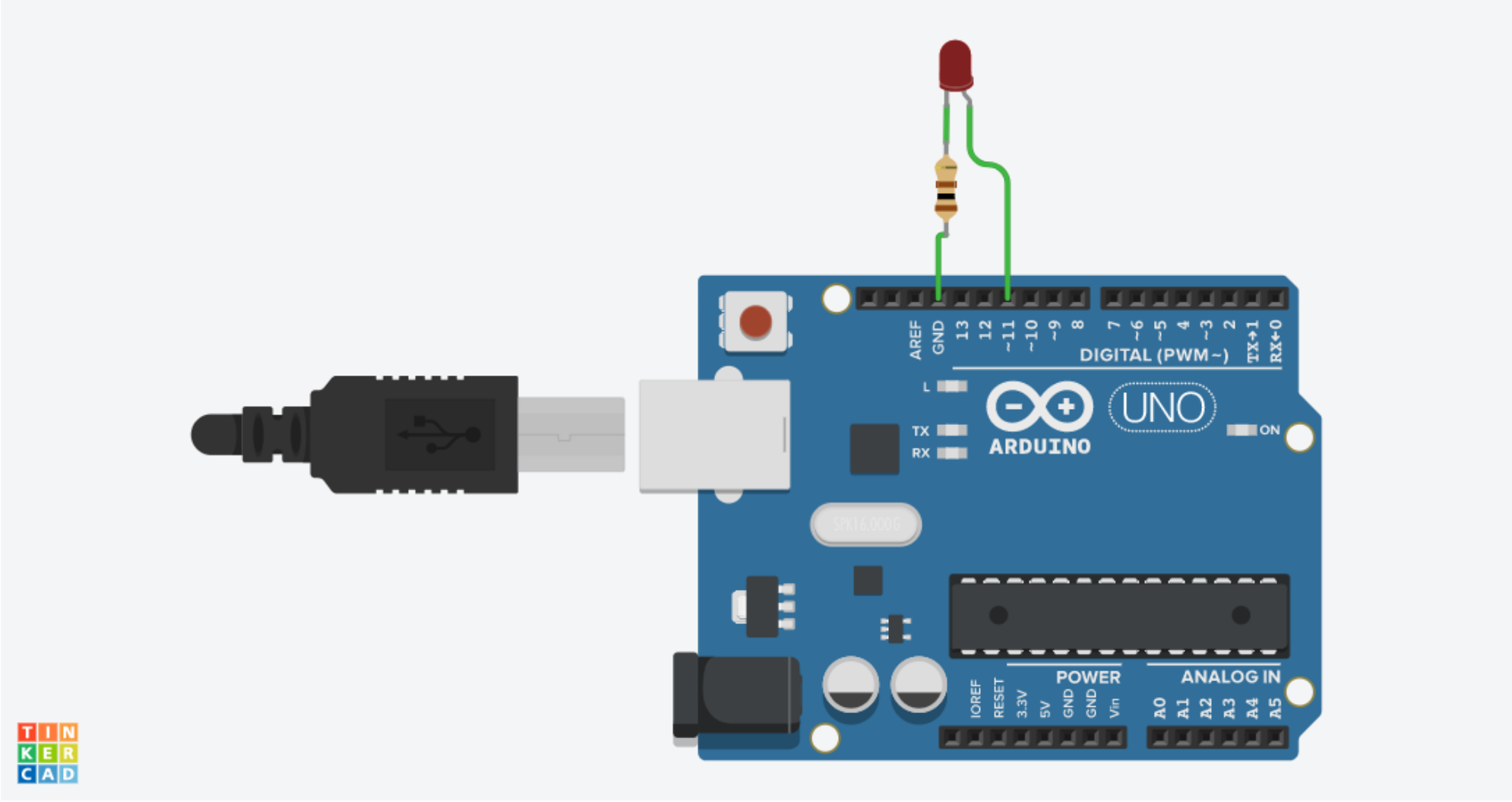
Entrada analógica



Entrada analógica

```
1  void setup()
2  {
3    Serial.begin(9600);
4    pinMode(A0, INPUT);
5  }
6
7  void loop()
8  {
9    int analogInput = analogRead(A0);
10   Serial.println(analogInput);
11 }
```

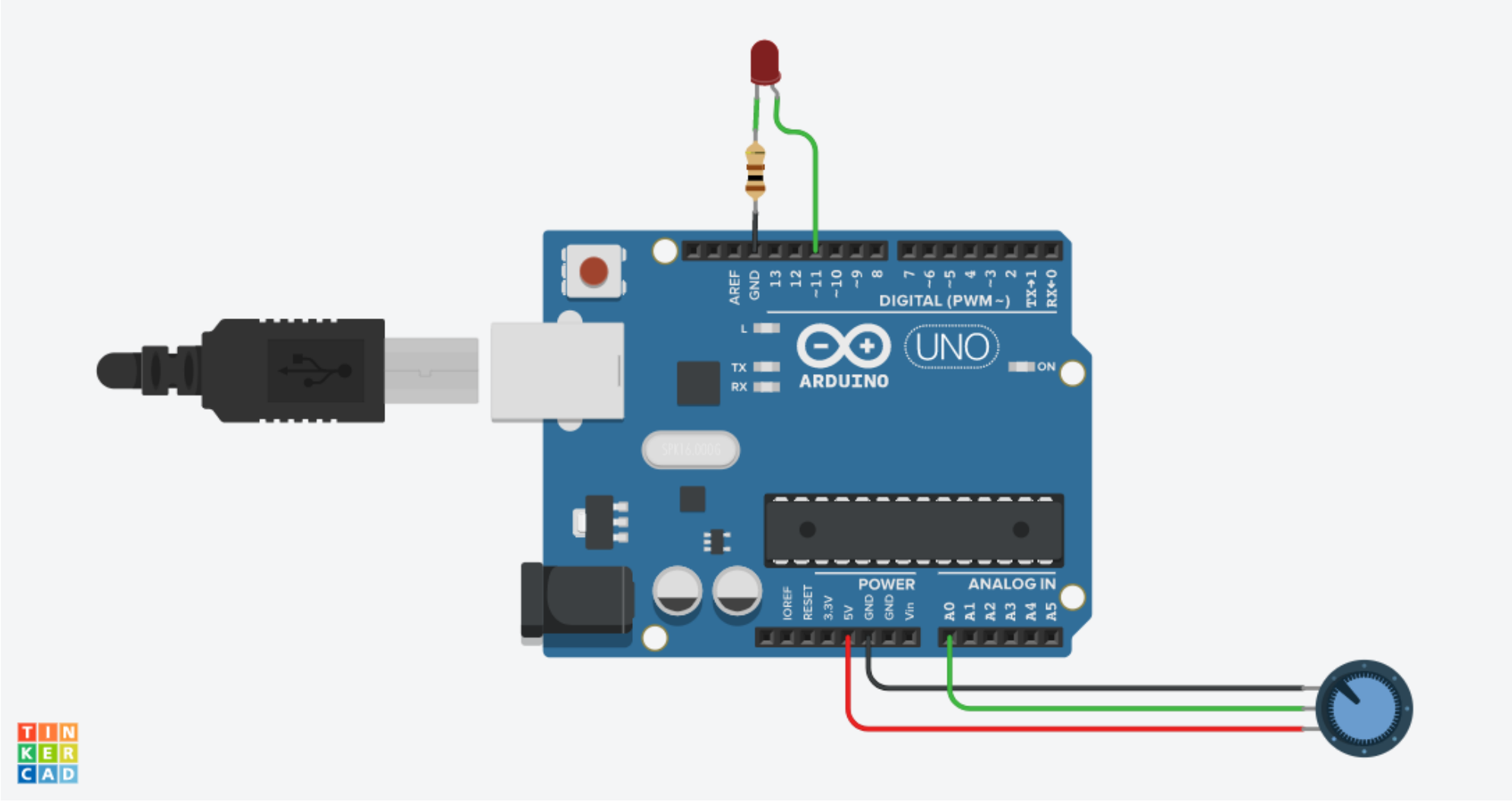
Saída analógica



Saída analógica

```
1  int fade = 0;
2
3  void setup()
4  {
5    pinMode(11, OUTPUT);
6  }
7
8  void loop()
9  {
10   for(fade = 0; fade <= 255; fade++)
11   {
12     analogWrite(11, fade);
13     delay(10);
14   }
15
16   for(fade = 255; fade > 0; fade--)
17   {
18     analogWrite(11, fade);
19     delay(10);
20   }
21
22   delay(500);
23 }
```

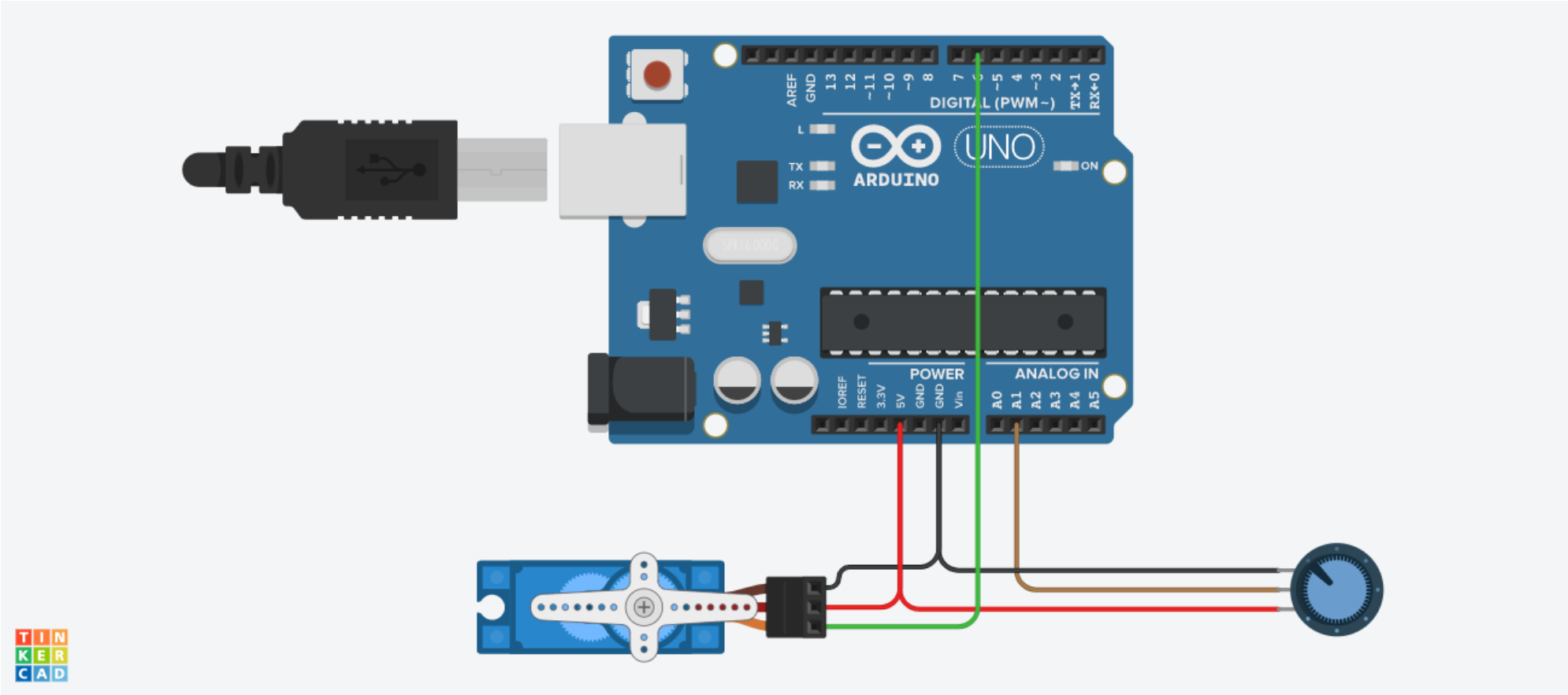
Entrada e saída analógicas



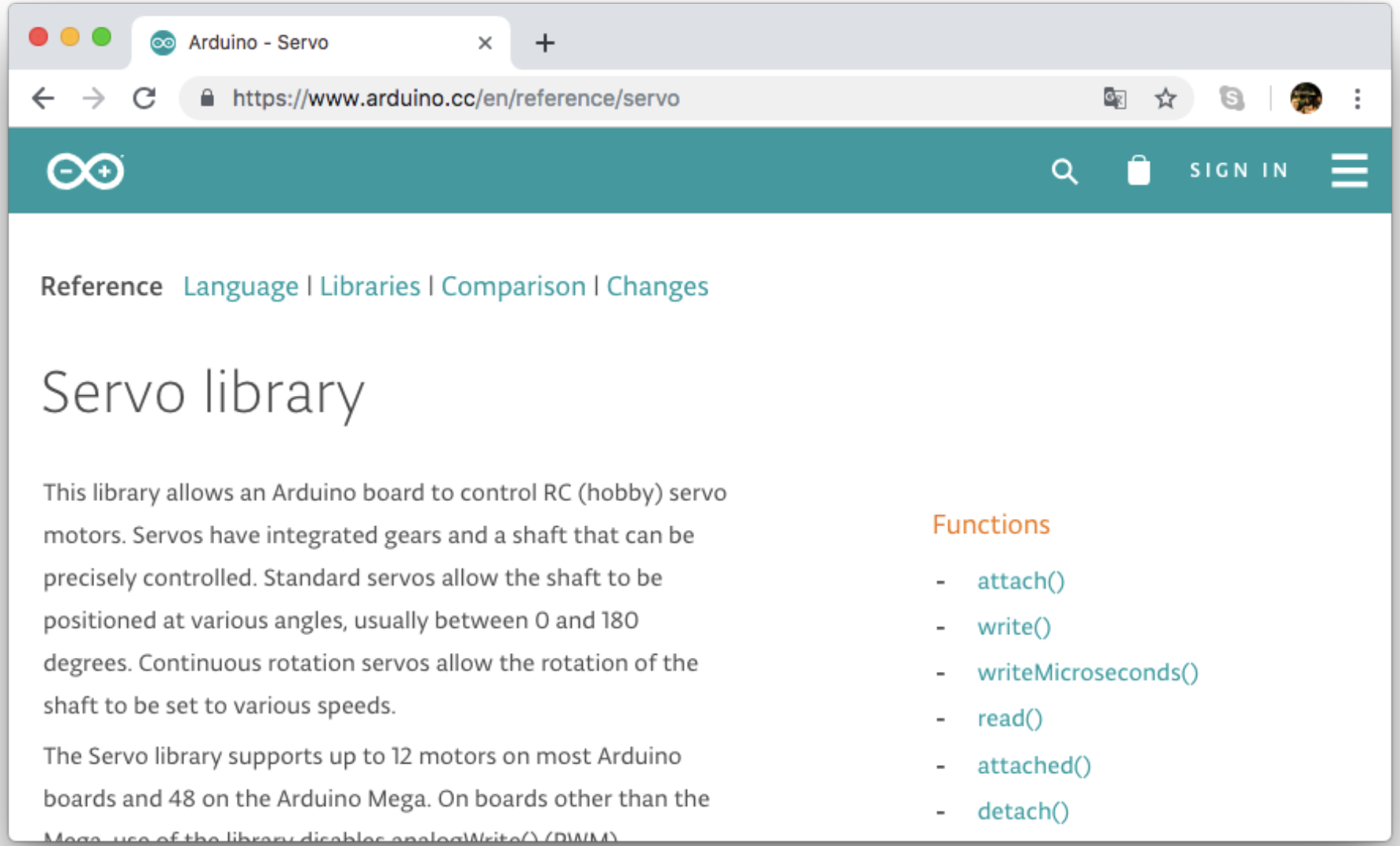
Entrada e saída analógicas

```
1  void setup()
2  {
3    pinMode(11, OUTPUT);
4  }
5
6  void loop()
7  {
8    int analogInput = analogRead(A0);
9
10   int analogOutput = map(analogInput, 0, 1023, 0, 255);
11
12   analogWrite(11, analogOutput);
13 }
```

Potenciômetro e Servo



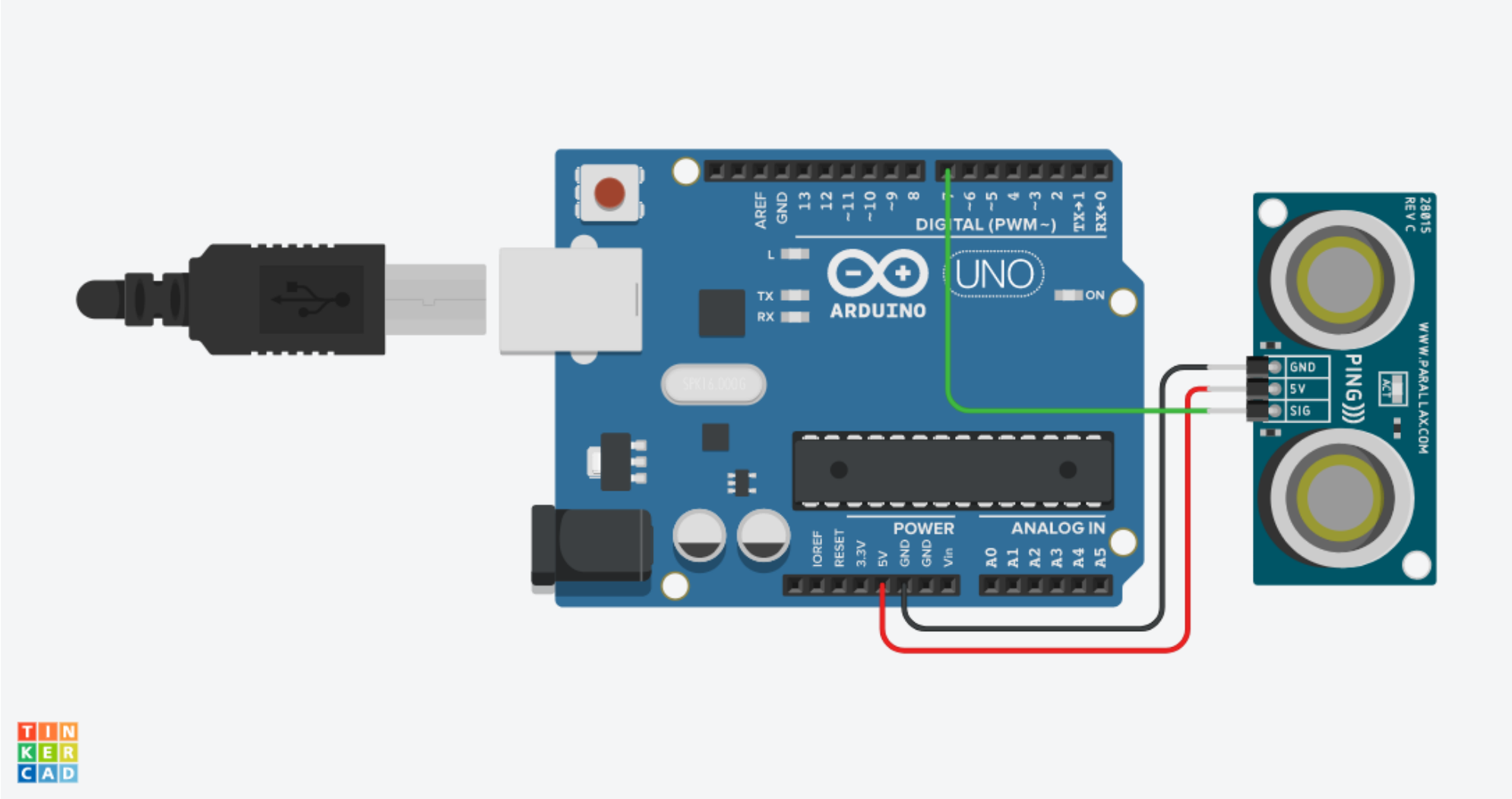
https://www.arduino.cc/en/reference/servo



Potenciômetro e Servo

```
1  #include <Servo.h>
2
3  Servo servo;
4
5  void setup()
6  {
7    pinMode(A1, INPUT);
8    servo.attach(6);
9  }
10
11 void loop()
12 {
13   int analogInput = analogRead(A1);
14
15   int servoPosition = map(analogInput, 0, 1023, 180, 0);
16
17   servo.write(servoPosition);
18
19   delay(10);
20 }
```

Sensor ultrassônico



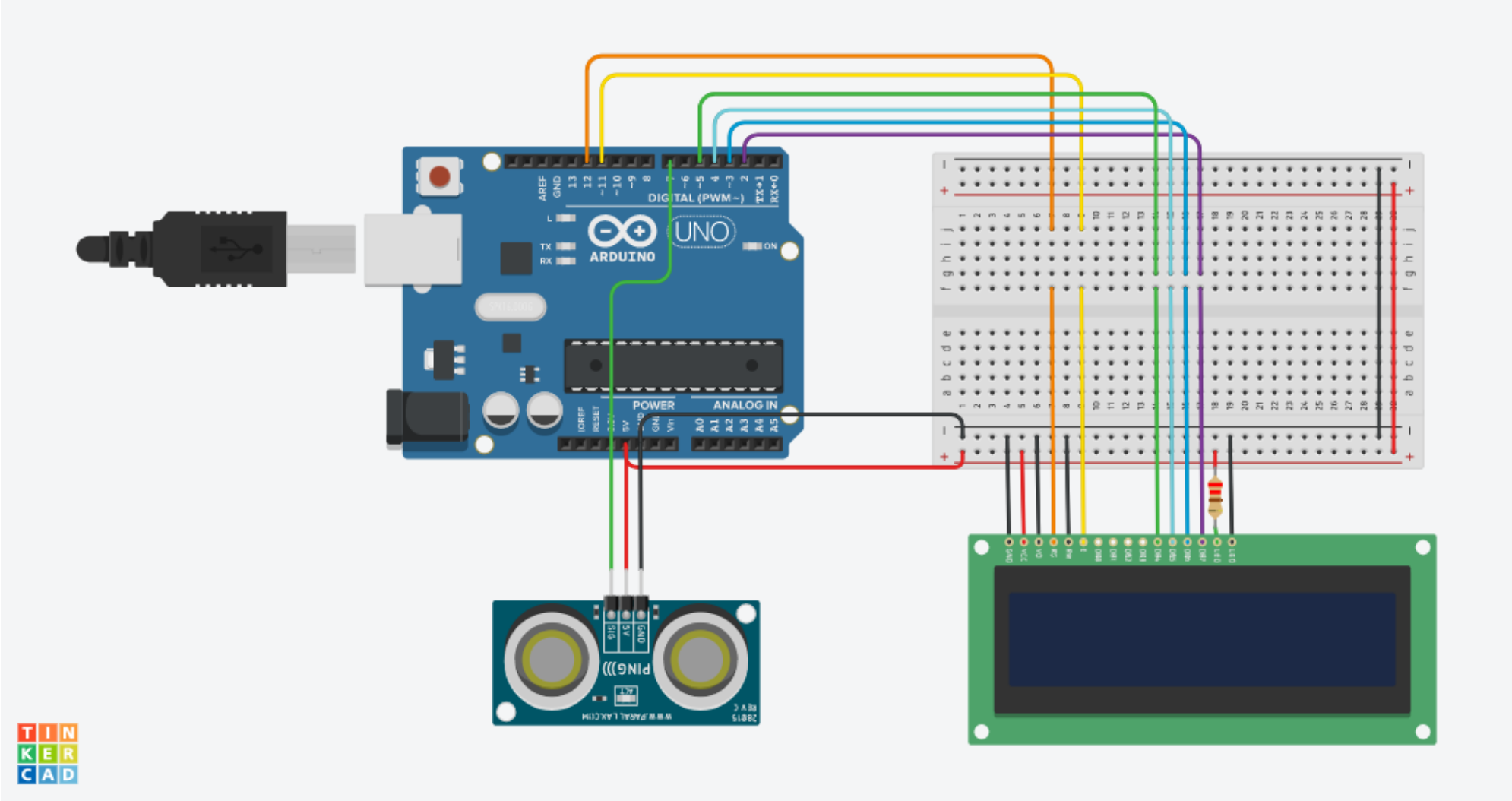
Sensor ultrassônico

```
1  long readUltrasonicDistance()
2  {
3    pinMode(7, OUTPUT);
4
5    digitalWrite(7, LOW);
6    delayMicroseconds(2);
7    digitalWrite(7, HIGH);
8    delayMicroseconds(10);
9    digitalWrite(7, LOW);
10
11   pinMode(7, INPUT);
12
13   return pulseIn(7, HIGH);
14 }
```

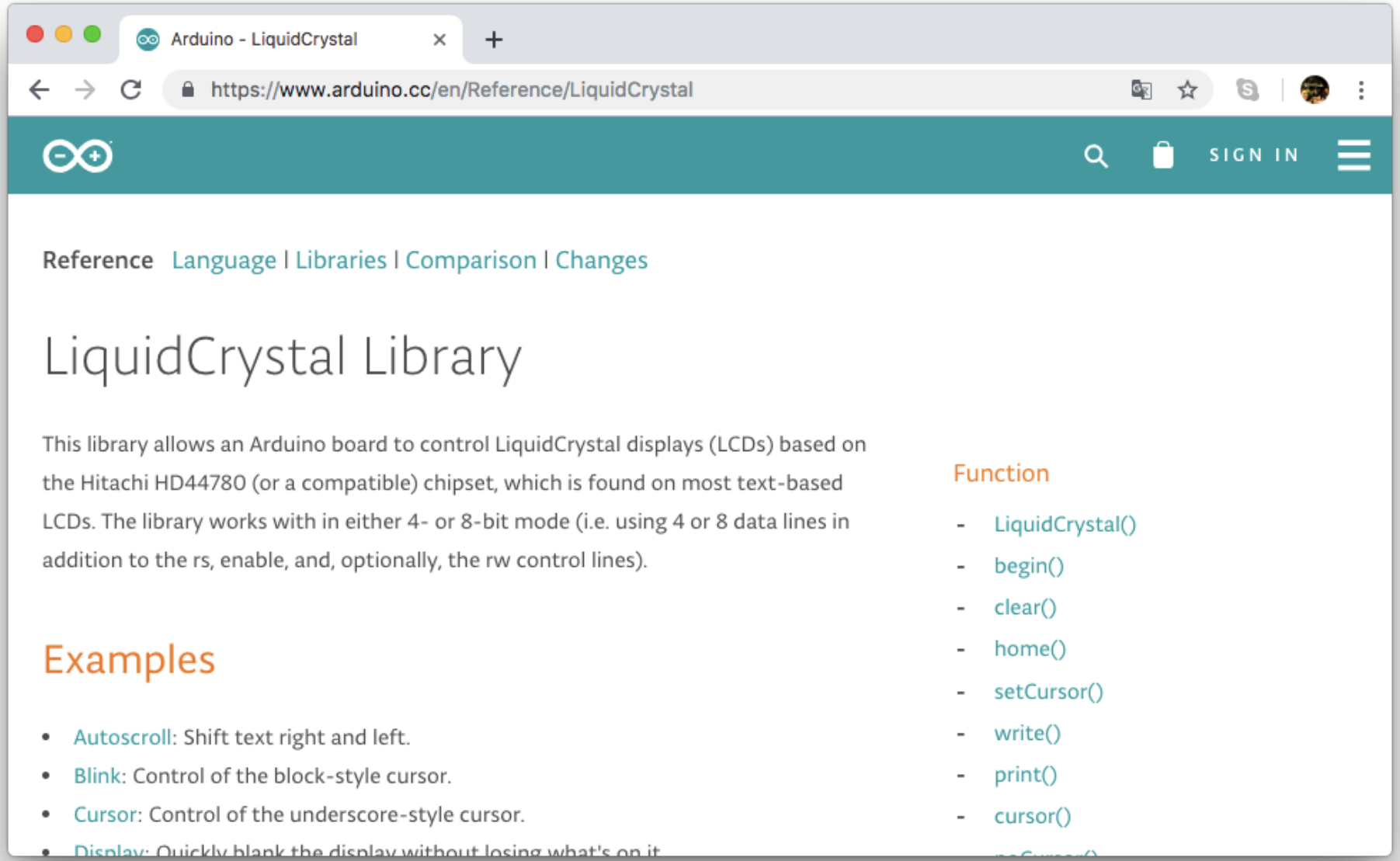
Sensor ultrassônico

```
15 void setup()
16 {
17   pinMode(7, INPUT);
18   Serial.begin(9600);
19 }
20
21 /* Speed of sound is 343 m/s, or 0,0343 cm/us. Divides
22  *   by two because the pulse goes forward and backward. */
23 const double soundSpeed = 343 * 100.0 / 1000000.0;
24
25 void loop()
26 {
27   double cm = (soundSpeed / 2) * readUltrasonicDistance();
28
29   Serial.print(cm);
30   Serial.println("cm");
31
32   delay(100);
33 }
```

Sensor ultrassônico e LCD



https://www.arduino.cc/en/Reference/LiquidCrystal



Sensor ultrassônico e LCD

```
20 LiquidCrystal lcd(12, 11, 5, 4, 3, 2);
21
22 void setup()
23 {
24   lcd.begin(16, 2);
25   lcd.print("Hello world!");
26 }
27
28 void loop()
29 {
30   lcd.setCursor(0, 1);
31   lcd.print("                ");
32   lcd.setCursor(0, 1);
33   String cm = String((soundSpeed / 2) * readUltrasonicDistance());
34   String msg = String(cm + " cm");
35   lcd.print(msg);
36
37   delay(500);
38 }
```

Referências

- https://www.arduino.cc
- https://www.arduino.cc/reference/en
- https://www.tinkercad.com
- https://youtu.be/WynYhZx_qds
- https://www.arduino.cc/en/Tutorial/Knob
- http://www.arduino.cc/en/Tutorial/Ping
- http://www.arduino.cc/en/Tutorial/LiquidCrystal

Obrigado!

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