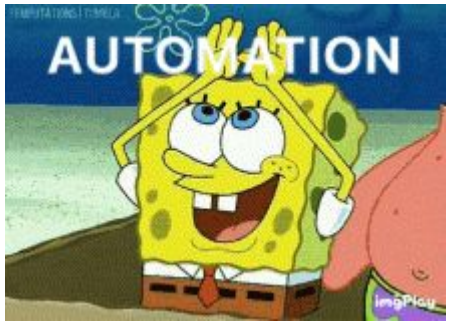
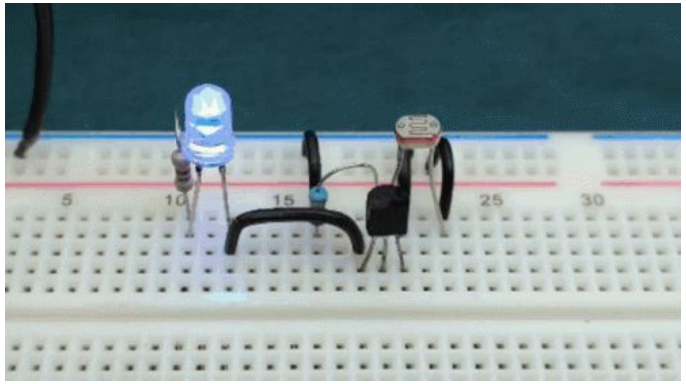
Android + Arduino

SEU APP CONTROLANDO O MUNDO REAL VIA BLUETOOTH

Por que esse tema?

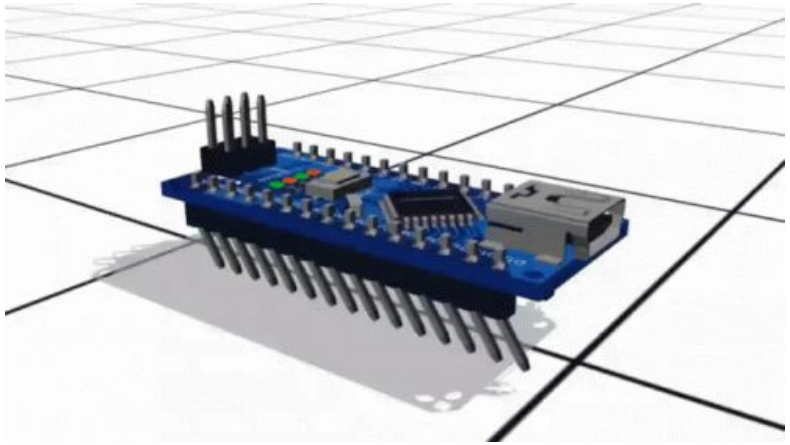
- Trazer o Android para além da tela
- Integração com hardware acessível
- Abrir portas para IoT, automação residencial, wearables DIY
- Projeto simples e interessante

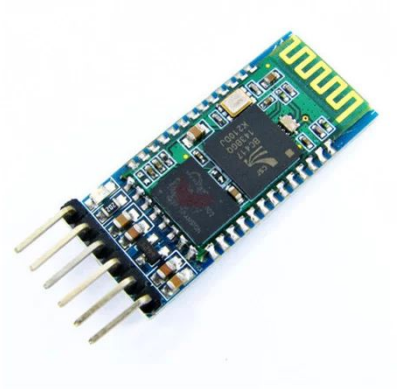


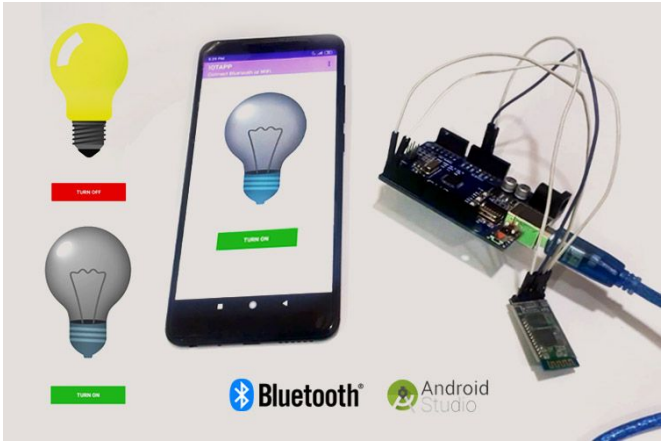


O que vamos ver hoje

1. Comunicação Bluetooth com Android
2. Como funciona o HC-05 com Arduino
3. Criando o app Android para controlar LED
4. Demonstração ao vivo
5. Ideias de expansão







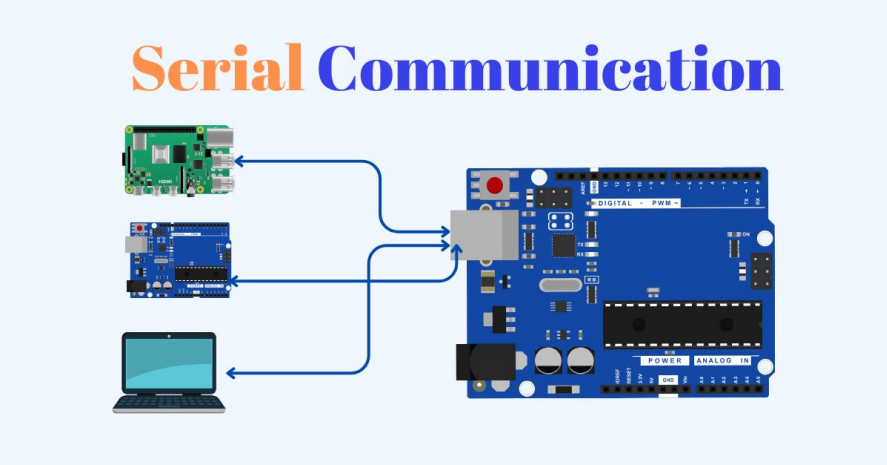
Comunicação Bluetooth: visão geral

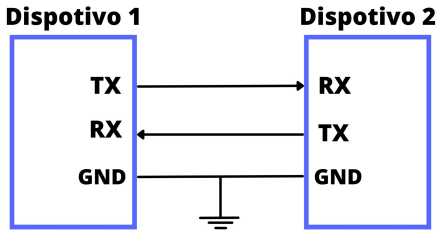
Bluetooth Clássico vs BLE

App Android se conecta via socket RFCOMM

Comunicação serial (9600 bps no HC-05)

Simples, rápido e confiável





Materiais utilizados

Arduino Uno ou Nano

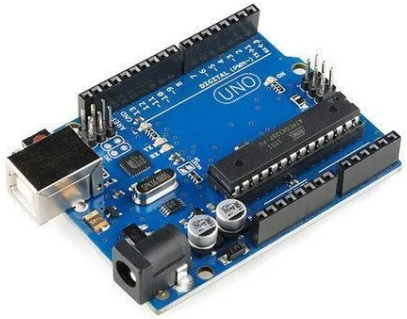
Módulo Bluetooth HC-05

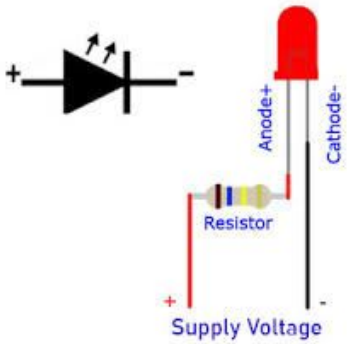
LED + resistor 220Ω

Cabos jumper

Smartphone Android (API 23+)

IDE Arduino e Android Studio





Esquema de conexão

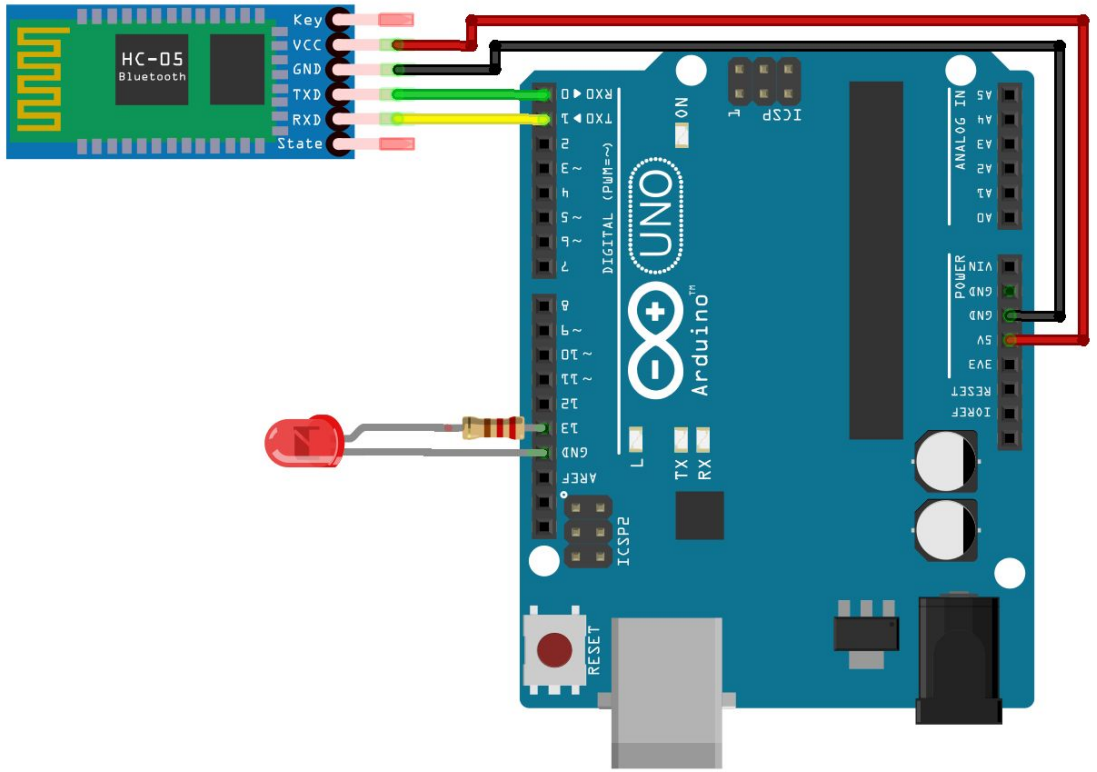
VCC HC-05 ⟶ 5V Arduino

GND HC-05 ⟶ GND Arduino

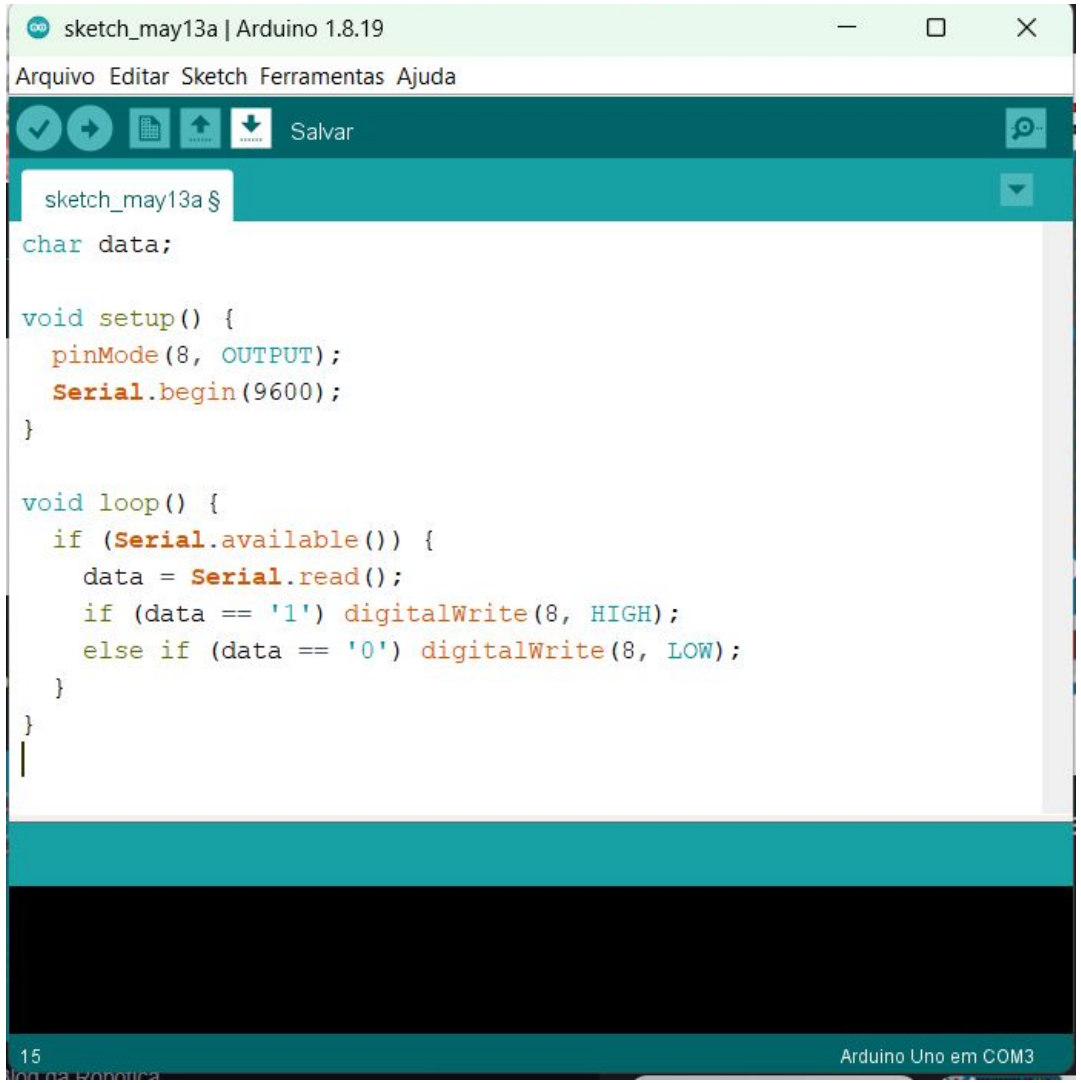
TX HC-05 ⟶ RX Arduino (com divisor de tensão)

RX HC-05 ⟶ TX Arduino

LED ⟶ pino digital D8 com resistor



Código Arduino



App Android: estrutura

Permissão Bluetooth no AndroidManifest.xml

Obter BluetoothAdapter

Buscar dispositivos pareados

Conectar via BluetoothSocket

Enviar comandos (1 e 0)

Código Android (Kotlin)

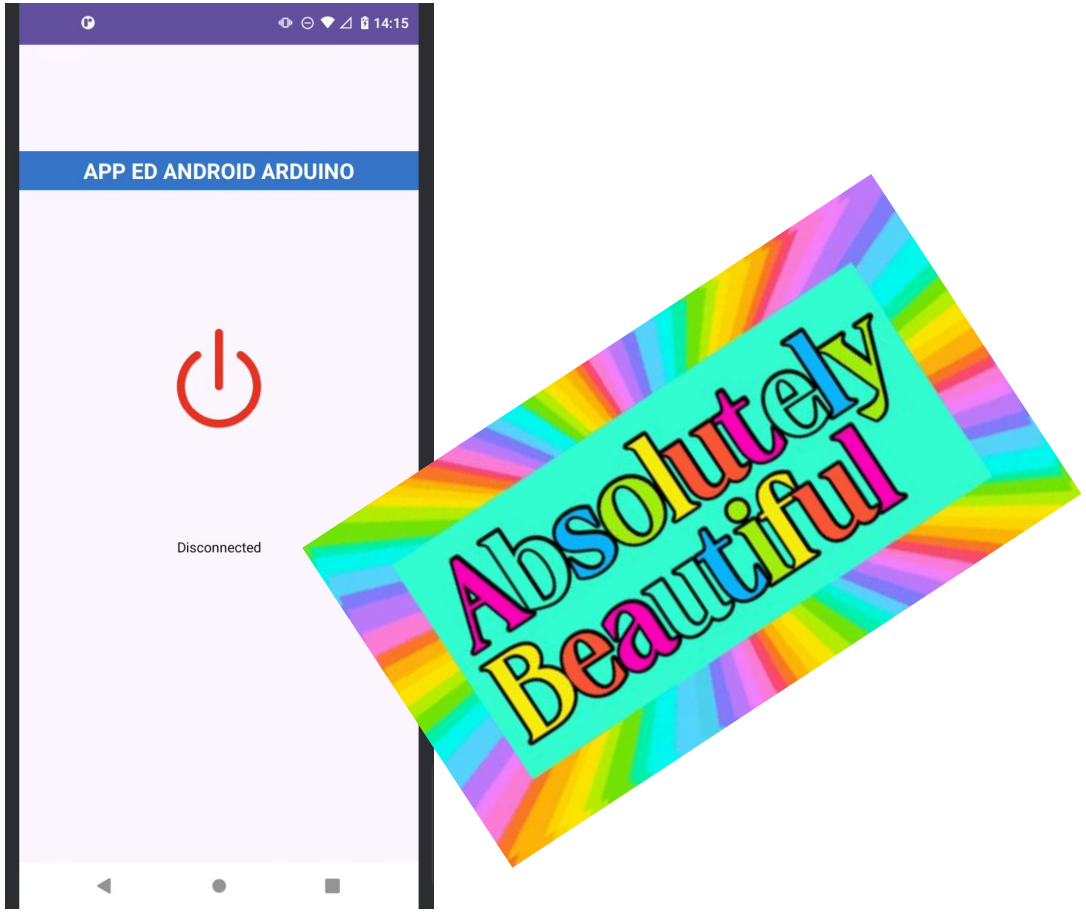
```
val device = bluetoothAdapter.getRemoteDevice(macAddress)
val socket = device.createRfcommSocketToServiceRecord(UUID.fromString(MY_UUID))
socket.connect()
val outputStream = socket.outputStream
btnOn.setOnClickListener { outputStream.write("1".toByteArray()) }
btnOff.setOnClickListener { outputStream.write("0".toByteArray()) }
```

Layout Android

Botão “Acender LED”

Botão “Apagar LED”

Status de conexão



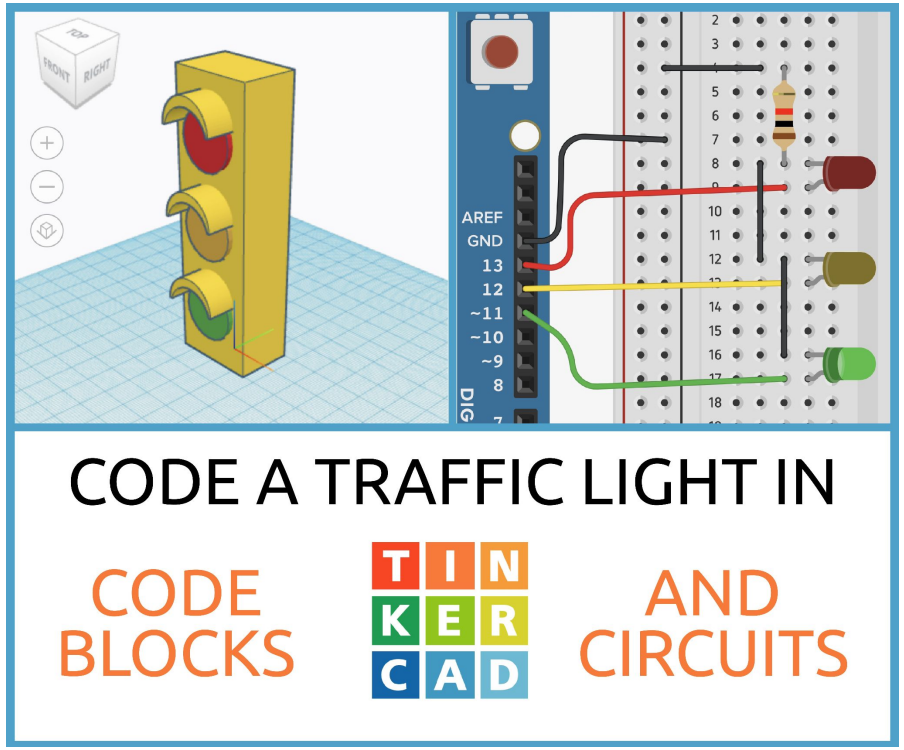
Demonstração prática

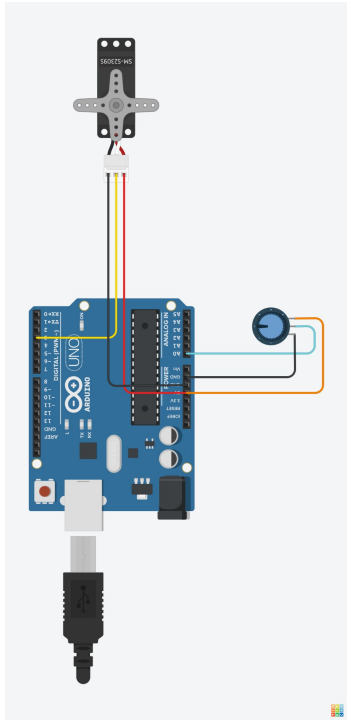
Conectar via Bluetooth

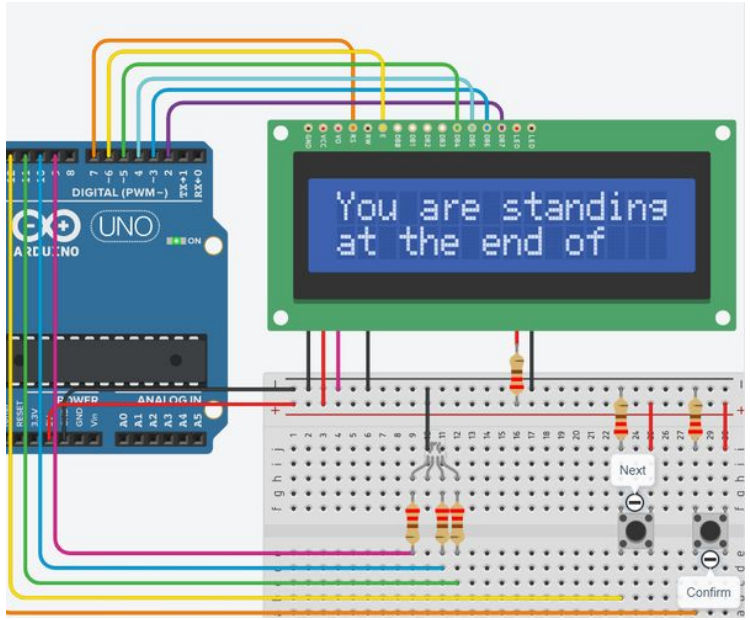
Acender e apagar LED em tempo real

Debug no Serial Monitor

Também via emulador

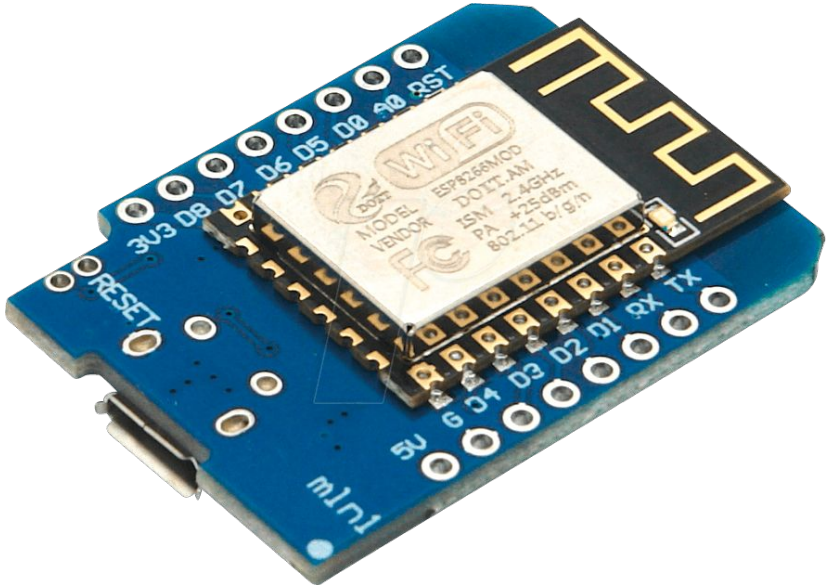


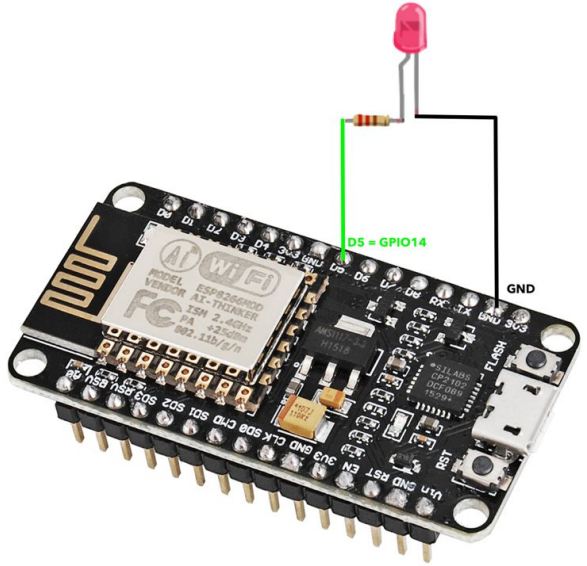


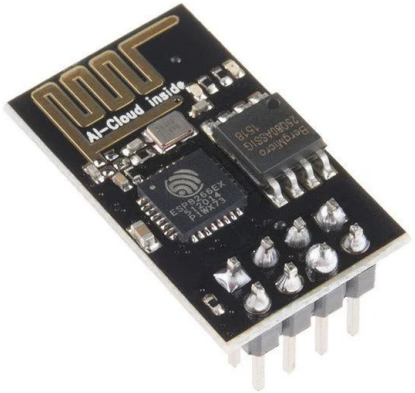


Alternativas

Wemos D1 | NodeMCU ESP8266 ESP32 | ESP01







Ideias para expandir

Comunicação bidirecional (leitura de sensores)

Controle via comandos de voz

Integração com Firebase

Controle múltiplo (motores, relés, sensores)

Conclusão e links

Android + Arduino é acessível e poderoso

Código e slides no GitHub

Contato para dúvidas

@edgarolv

linkedin.com/in/edgarolv

https://github.com/EdgarOlv/SimpleArduinoLedBluetooth

Como diria minha ex

TERMINAMOS!!

Agradecimentos ao PANCADÃO TACA CACHAÇA no spotify pra ajudar fazer o slide