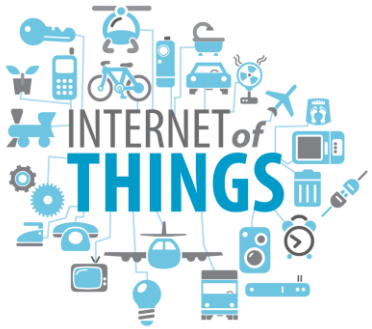
UNIVERSITY OF SCIENCE - VNUHCM
Faculty of Information Technology

INTERNET OF THINGS

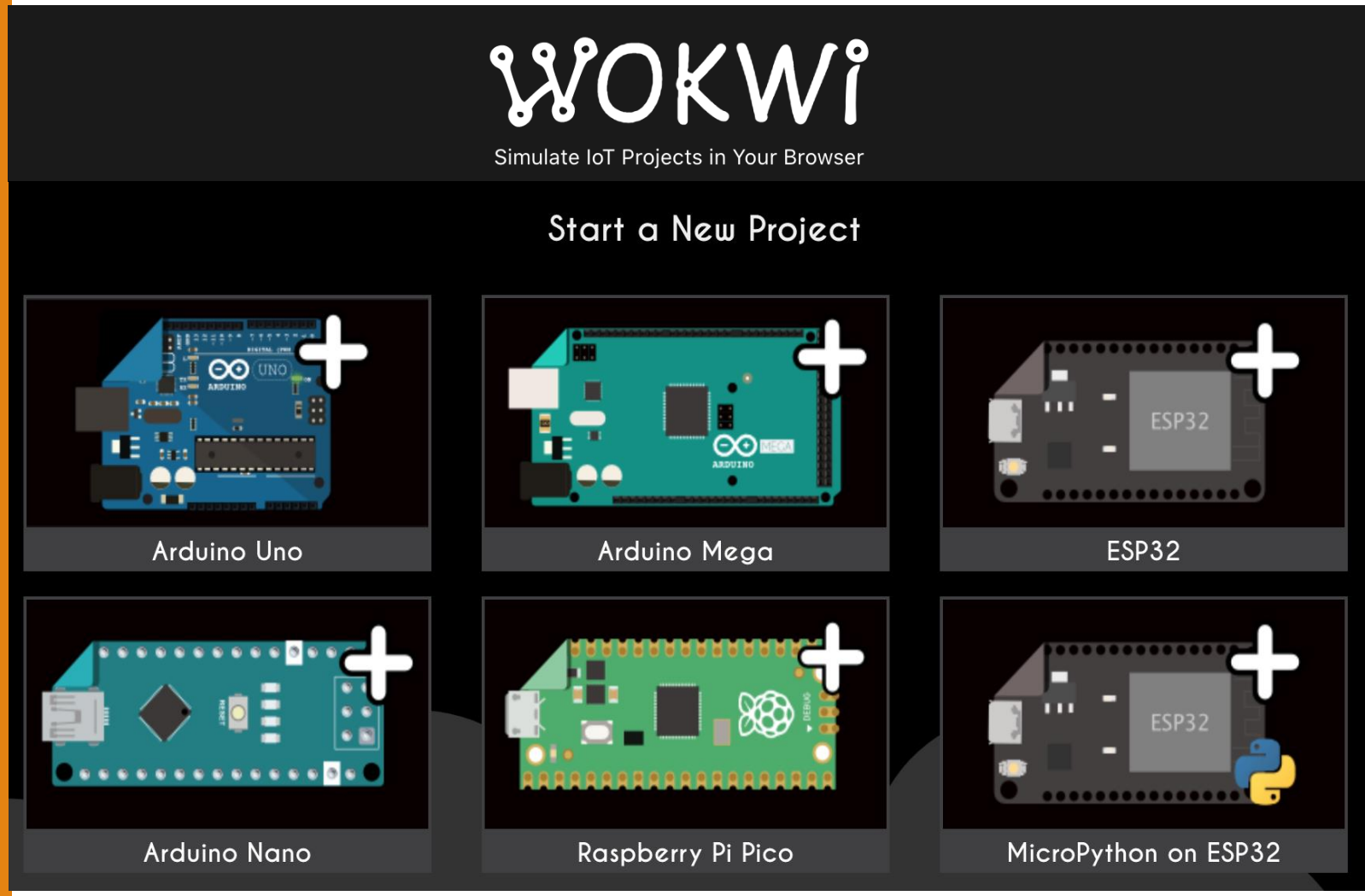
4.1

INTRODUCE TO ESP32 SIMULATOR

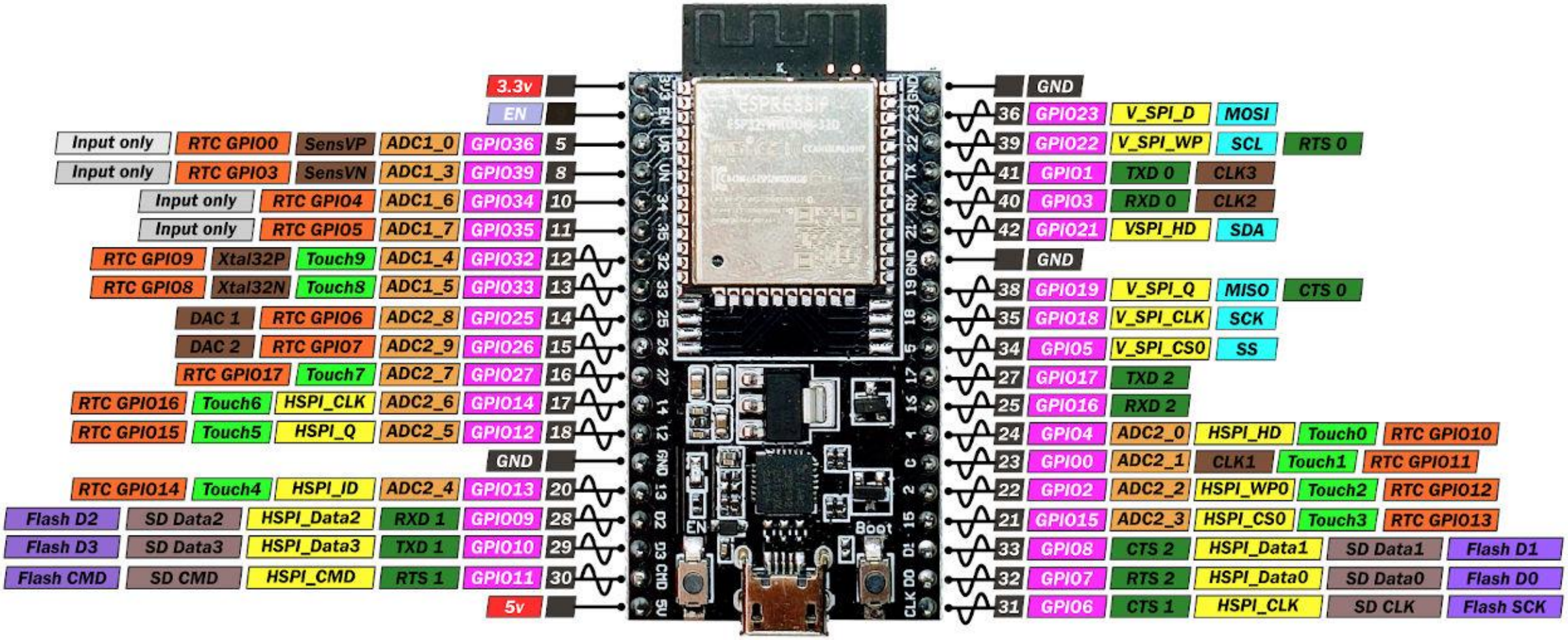


ESP32 SIMULATOR

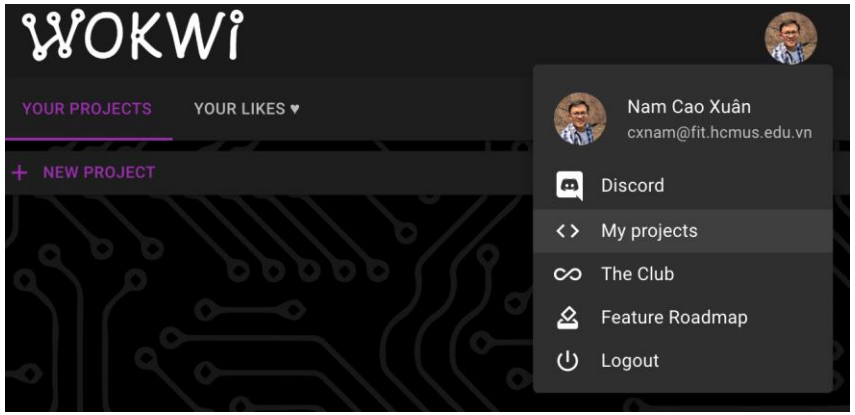
wokwi.com

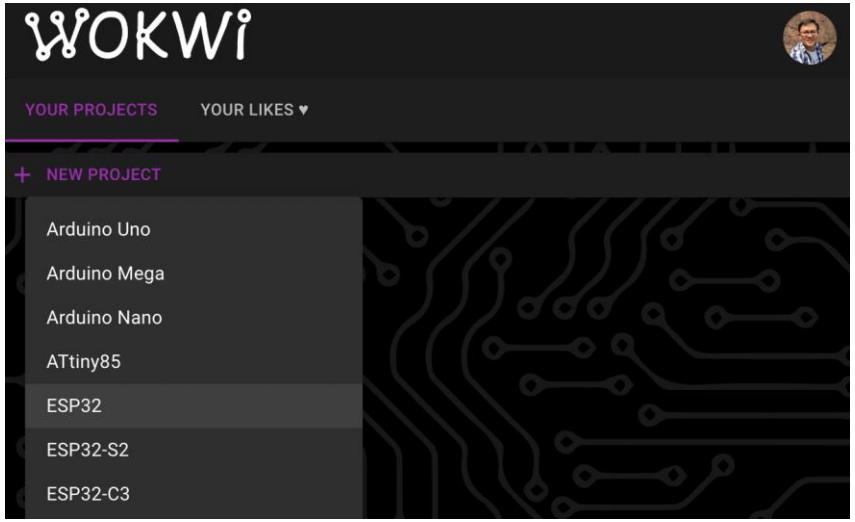


ESP32 DevKitC V4 PINOUT



Programming with ESP32 Simulator





Create new project

- Login your account
- Select ***My projects > New Project > ESP32***

WOKWi SAVE SHARE Add library Docs

sketch.ino diagram.json ● Library Manager

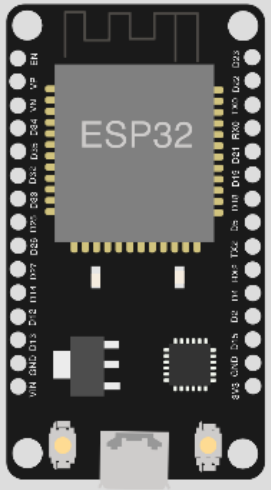
```
1  void setup() {
2    // put your setup code here, to run once:
3    Serial.begin(115200);
4    Serial.println("Hello, ESP32!");
5  }
6
7  void loop() {
8    // put your main code here, to run repeatedly:
9    delay(10); // this speeds up the simulation
10 }
11
```

Code

Simulation

Start simulator

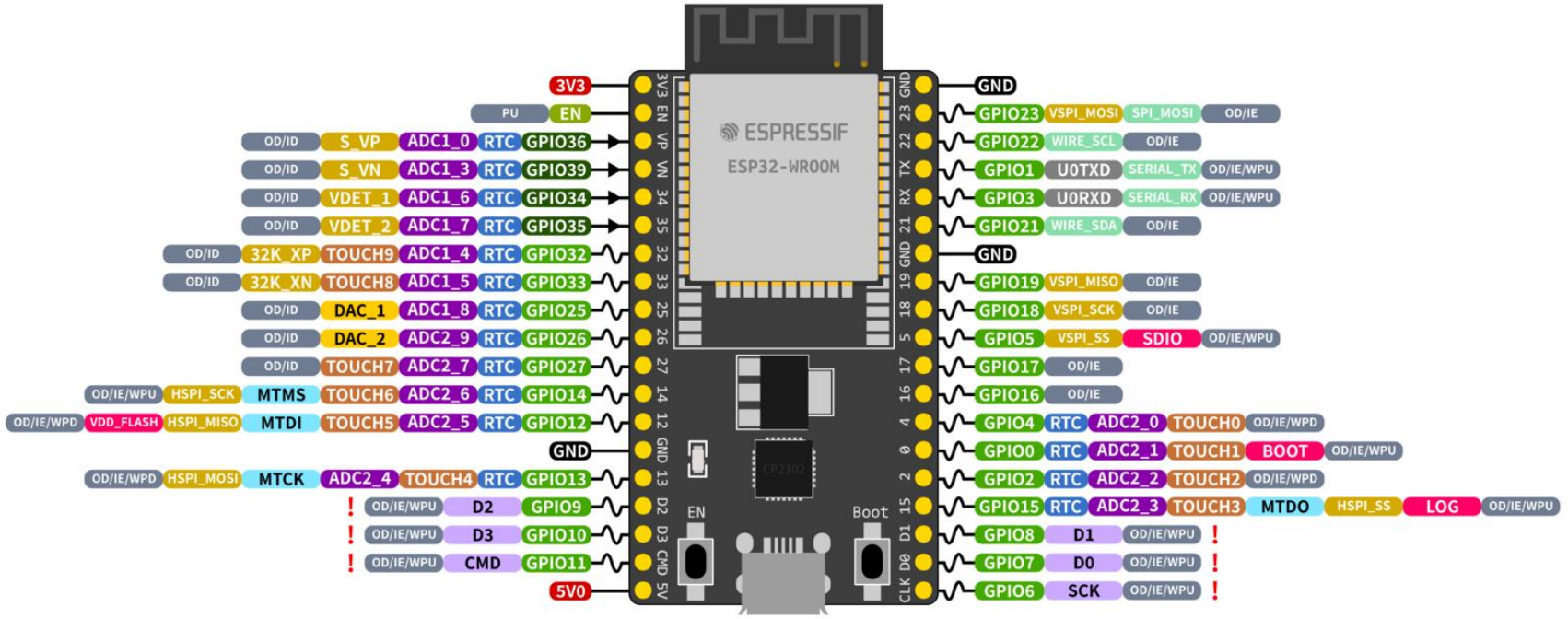
Insert devices




```
Hello, ESP32!
```

Serial Monitor

ESP32-DevKitC



ESP32 Specs

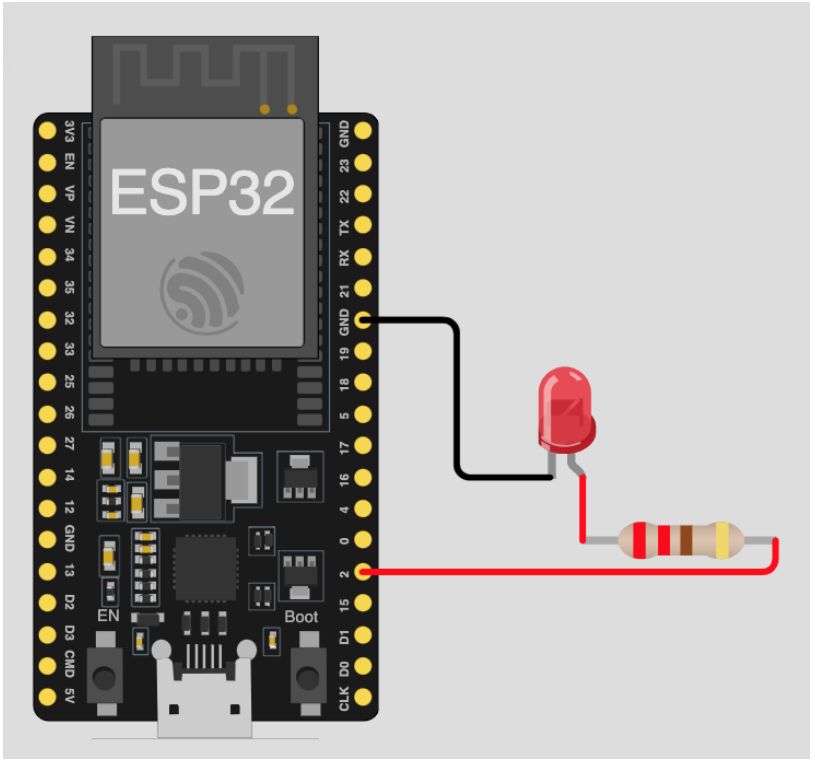
32-bit Xtensa® dual-core @240MHz
Wi-Fi IEEE 802.11 b/g/n 2.4GHz
BLuetooth 4.2 BR/EDR and BLE
520 KB SRAM (16 KB for cache)
448 KB ROM
34 GPIOs, 4x SPI, 3x UART, 2x I2C,
2x I2S, RMT, LED PWM, 1 host SD/eMMC/SDIO,
1 slave SDIO/SPI, TWAI®, 12-bit ADC, Ethernet

PWM Capable Pin
GPIOX GPIO Input Only
GPIOX GPIO Input and Output
DAC_X Digital-to-Analog Converter
DEBUG JTAG for Debugging
FLASH External Flash Memory (SPI)
ADCX_CH Analog-to-Digital Converter
TOUCHX Touch Sensor Input Channel
OTHER Other Related Functions
SERIAL Serial for Debug/Programming
ARDUINO Arduino Related Functions
STRAP Strapping Pin Functions

RTC RTC Power Domain (VDD3P3_RTC)
GND Ground
PWD Power Rails (3V3 and 5V)
! Pin Shared with the Flash Memory *Can't be used as regular GPIO*

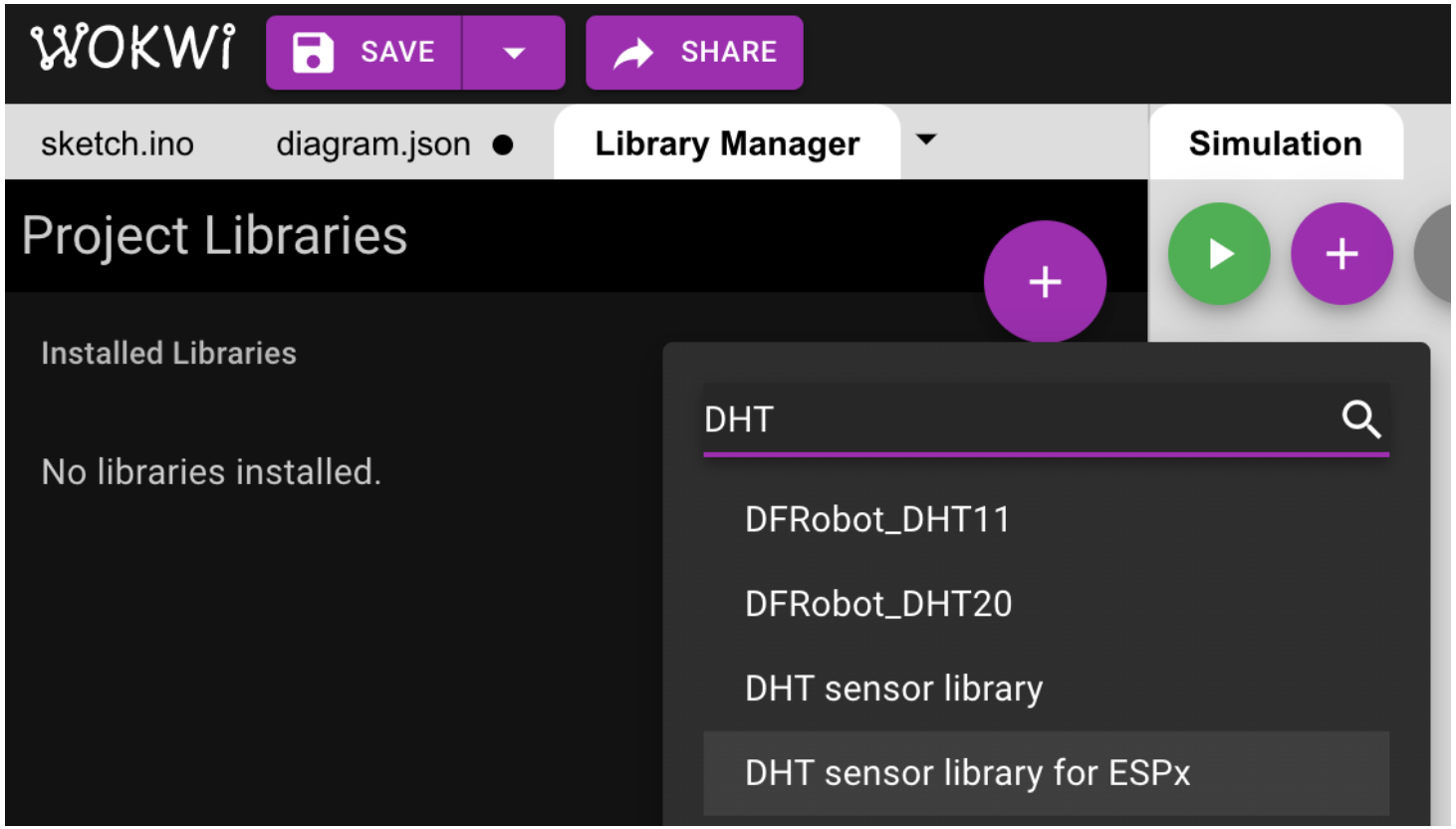
GPIO STATE
WPU: *Weak Pull-up (Internal)*
WPD: *Weak Pull-down (Internal)*
PU: *Pull-up (External)*
IE: *Input Enable (After Reset)*
ID: *Input Disabled (After Reset)*
OE: *Output Enable (After Reset)*
OD: *Output Disabled (After Reset)*

```arduino
#define LED 2

void setup() {
  pinMode(LED, OUTPUT);
}

void loop() {
  digitalWrite(LED, HIGH);
  delay(500);
  digitalWrite(LED, LOW);
  delay(500);
}
```



Blink

DHT22



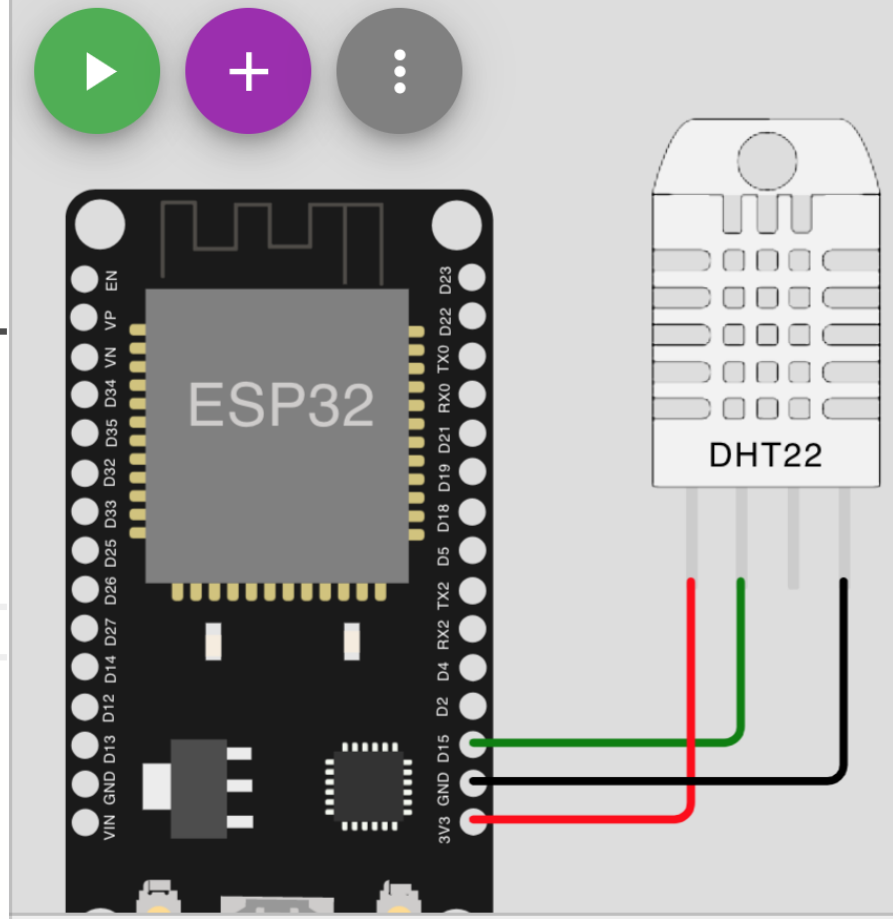
Add library

- Click on tab ***Library Manager***
- Click on ***Add (+) Button***
- Search library that you would like to add > Select

esp32-dht22.ino ● | diagram.json | libraries.txt | Library Manager

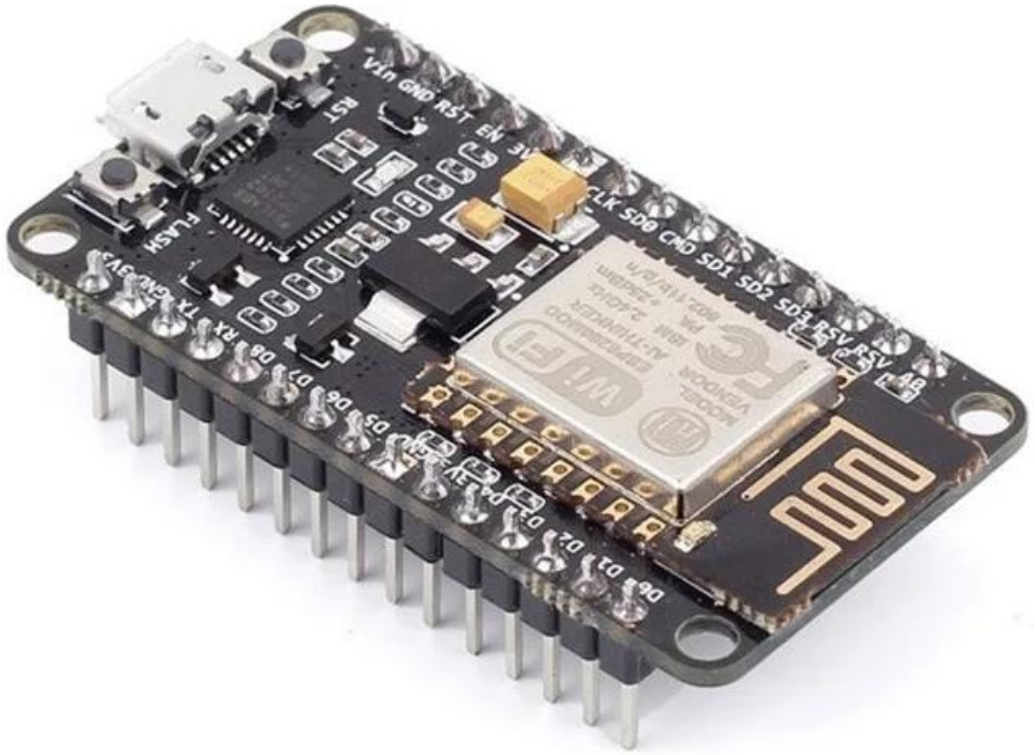
```ino
#include "DHTesp.h"

const int DHT_PIN = 15;

DHTesp dhtSensor;

void setup() {
  Serial.begin(115200);
  dhtSensor.setup(DHT_PIN, DHTesp::DHT22);
}

void loop() {
  TempAndHumidity  data = dhtSensor.getTempAndHumidity();
  Serial.println("Temp: " + String(data.temperature, 2) + "°C");
  Serial.println("Humidity: " + String(data.humidity, 1) + "%");
  Serial.println("---");
  delay(1000);
}
```

Simulation




```
Temp: 24.00°C
Humidity: 40.0%
```

DHT22



Connect to Wifi

Connect to Wifi

Default in Simulator

```
#include <WiFi.h>

const char* ssid = "Wokwi-GUEST";
const char* password = "";

void wifiConnect() {
  WiFi.begin(ssid, password);
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }
  Serial.println(" Connected!");
}
```

```
void setup() {
  Serial.begin(9600);
  Serial.print("Connecting to WiFi");

  wifiConnect();

  Serial.println("IP address: ");
  Serial.println(WiFi.localIP());
}

void loop() {
  delay(100);
}
```