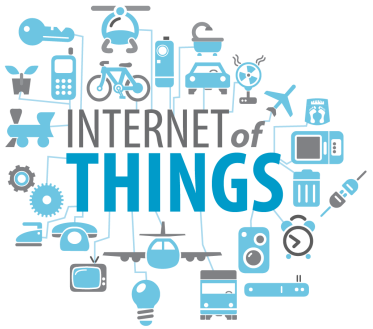
UNIVERSITY OF SCIENCE - VNUHCM
Faculty of Information Technology

INTERNET OF THINGS

4.1

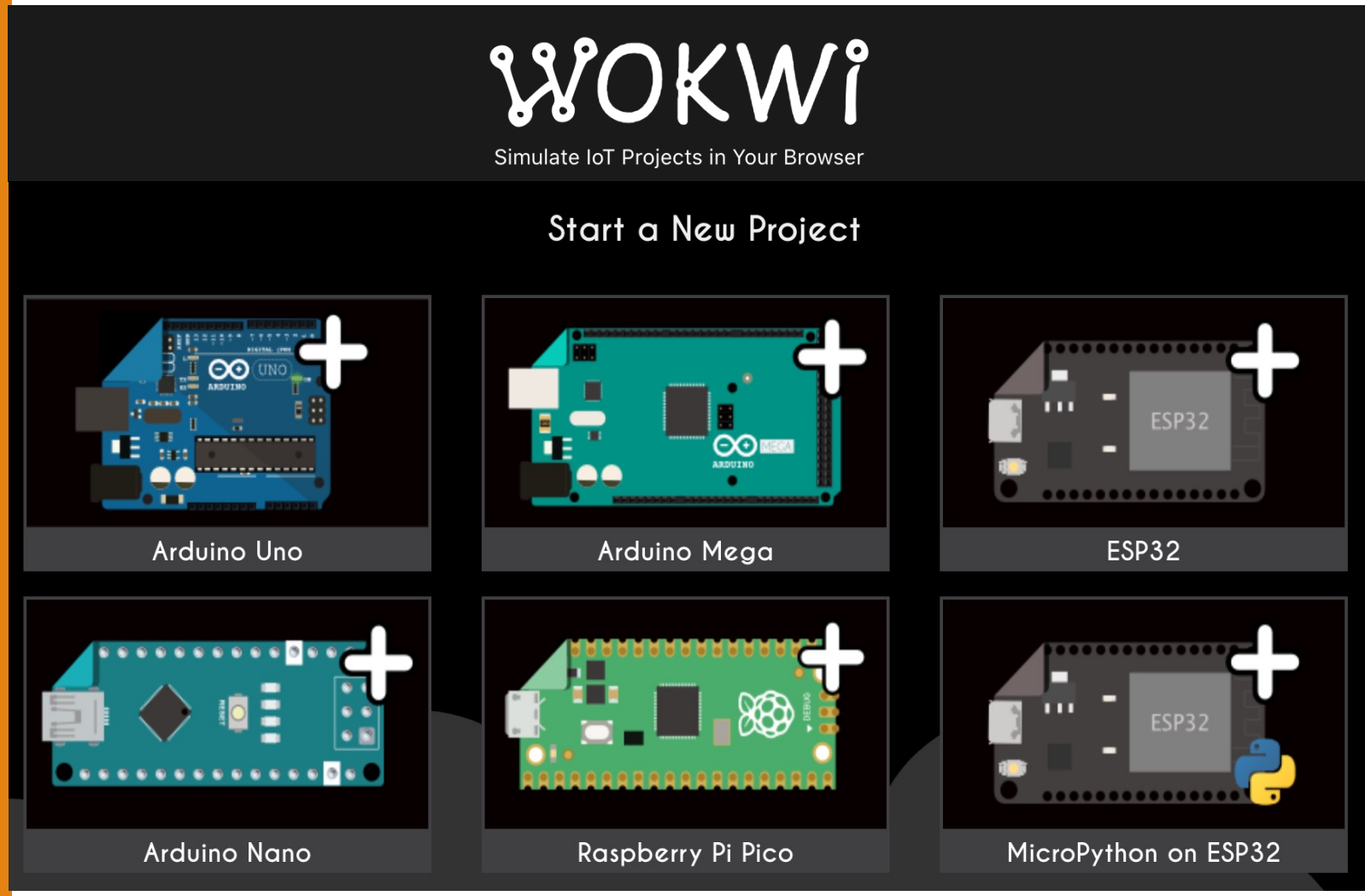
INTRODUCE TO ESP32 SIMULATOR

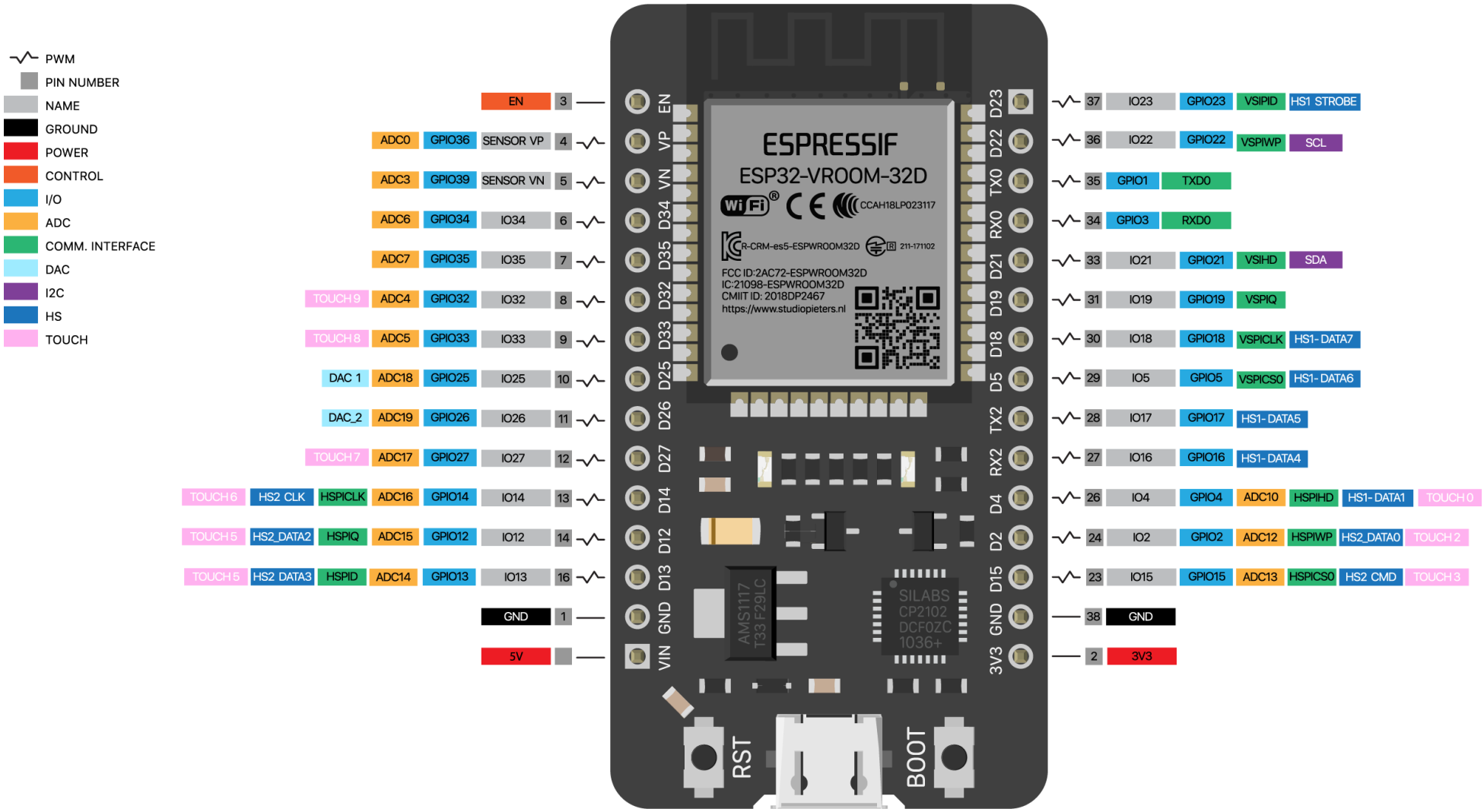


LECTURER: CAO XUÂN NAM

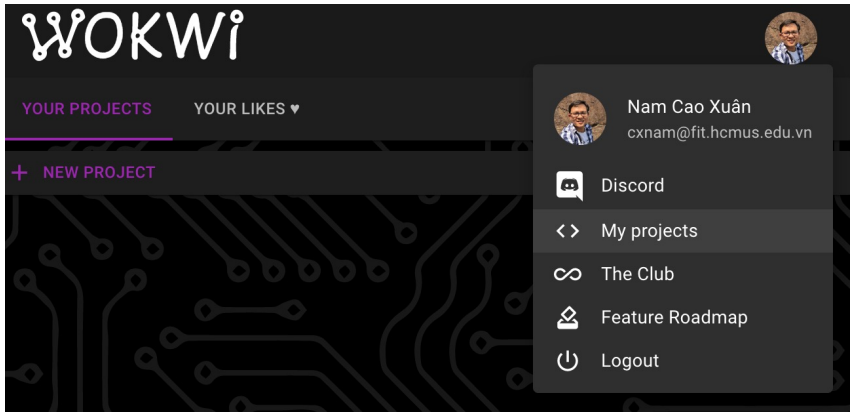
ESP32 SIMULATOR

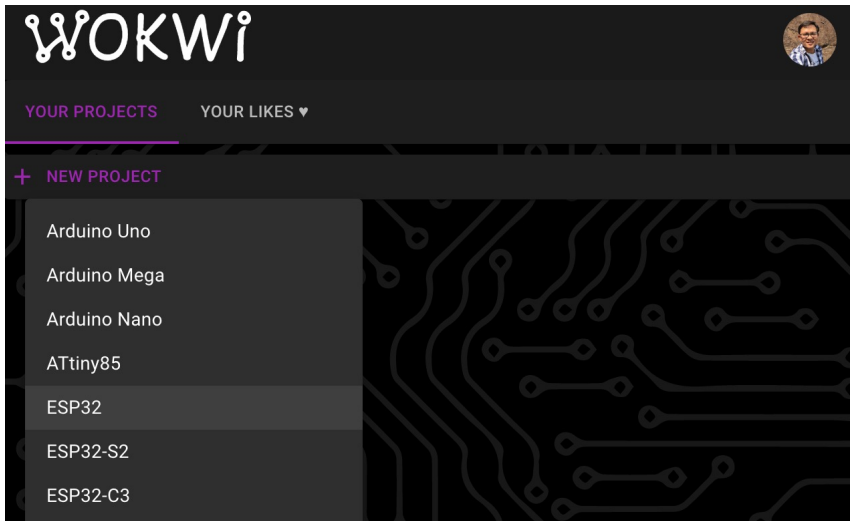
wokwi.com




PWM
PIN NUMBER
NAME
GROUND
POWER
CONTROL
I/O
ADC
COMM. INTERFACE
DAC
I2C
HS
TOUCH
EN 3
ADC0 GPIO36 SENSOR VP 4
ADC3 GPIO39 SENSOR VN 5
ADC6 GPIO34 IO34 6
ADC7 GPIO35 IO35 7
TOUCH 9 ADC4 GPIO32 IO32 8
TOUCH 8 ADC5 GPIO33 IO33 9
DAC 1 ADC18 GPIO25 IO25 10
DAC_2 ADC19 GPIO26 IO26 11
TOUCH 7 ADC17 GPIO27 IO27 12
TOUCH 6 HS2 CLK HSPICLK ADC16 GPIO14 IO14 13
TOUCH 5 HS2_DATA2 HSPIQ ADC15 GPIO12 IO12 14
TOUCH 5 HS2 DATA3 HSPID ADC14 GPIO13 IO13 16
GND 1
5V
EN VP VN D34 D35 D32 D33 D25 D26 D27 D14 D12 D13 GND VIN
ESPRESSIF
ESP32-VROOM-32D
CCAH18LP023117
R-CRM-es5-ESPWROOM32D
211-171102
FCC ID:2AC72-ESPWROOM32D
IC:21098-ESPWROOM32D
CMIIT ID: 2018DP2467
https://www.studiopieters.nl
AMS1117 T33 F29LC
SILABS CP2102 DCF0ZC 1036+
RST
BOOT
D23 D22 TX0 RX0 D21 D19 D18 D5 TX2 RX2 D4 D2 D15 GND 3V3
37 IO23 GPIO23 VSIPID HS1 STROBE
36 IO22 GPIO22 VSPIWP SCL
35 GPIO1 TXD0
34 GPIO3 RXD0
33 IO21 GPIO21 VSIHD SDA
31 IO19 GPIO19 VSPIQ
30 IO18 GPIO18 VSPICLK HS1- DATA7
29 IO5 GPIO5 VSPICS0 HS1- DATA6
28 IO17 GPIO17 HS1- DATA5
27 IO16 GPIO16 HS1- DATA4
26 IO4 GPIO4 ADC10 HSPIHD HS1- DATA1 TOUCH 0
24 IO2 GPIO2 ADC12 HSPIWP HS2_DATA0 TOUCH 2
23 IO15 GPIO15 ADC13 HSPICS0 HS2 CMD TOUCH 3
38 GND
2 3V3

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

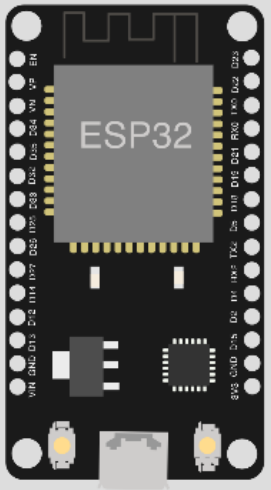
```
1  void setup() {
2    // put your setup code here, to run once:
3    Serial.begin(115200);
4    Serial.println("Hello, ESP32!");
5  }
6
7  void loop() {
8    // put your main code here, to run repeatedly:
9    delay(10); // this speeds up the simulation
10 }
11
```

Code

Simulation

Start simulator

Insert devices




```
Hello, ESP32!
```

Serial Monitor

Rotate devices

```
{
  "type": "wokwi-resistor",
  "id": "r1",
  "top": 121.88,
  "left": 102.99,
  "rotate": 270,
  "attrs": { "value": "220" }
}
```

Method 1:

- Select device > Press ***"R"*** key

Method 2:

- Click on tab ***diagram.json***

- Insert "rotate" attribute of ***wokwi-resistor***

```
"type": "wokwi-resistor",
"id": "r1",
"top": 121.88,
"left": 157.83,
"attrs": { "value": "220" }
```

Set resistance of a resistor

- Click on tab ***diagram.json***

- Set resistance in ***“value”*** attribute of ***wokwi-resistor***

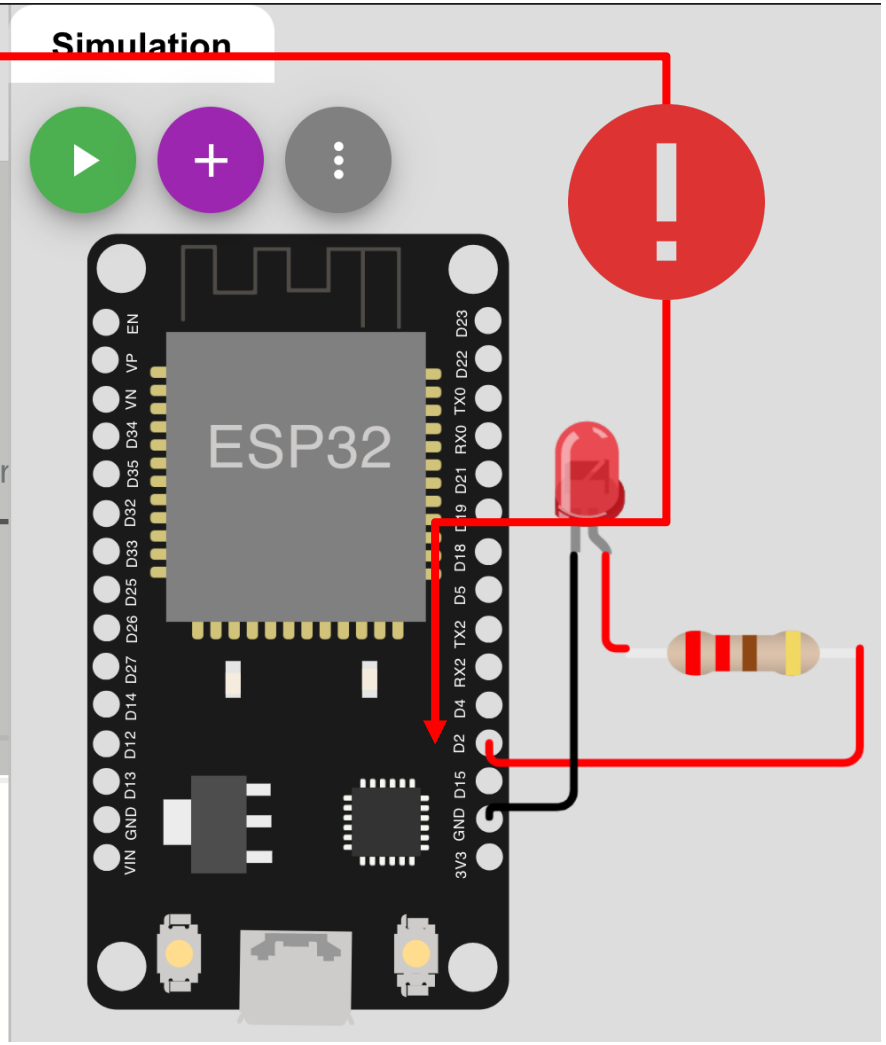
Only use number

Blink

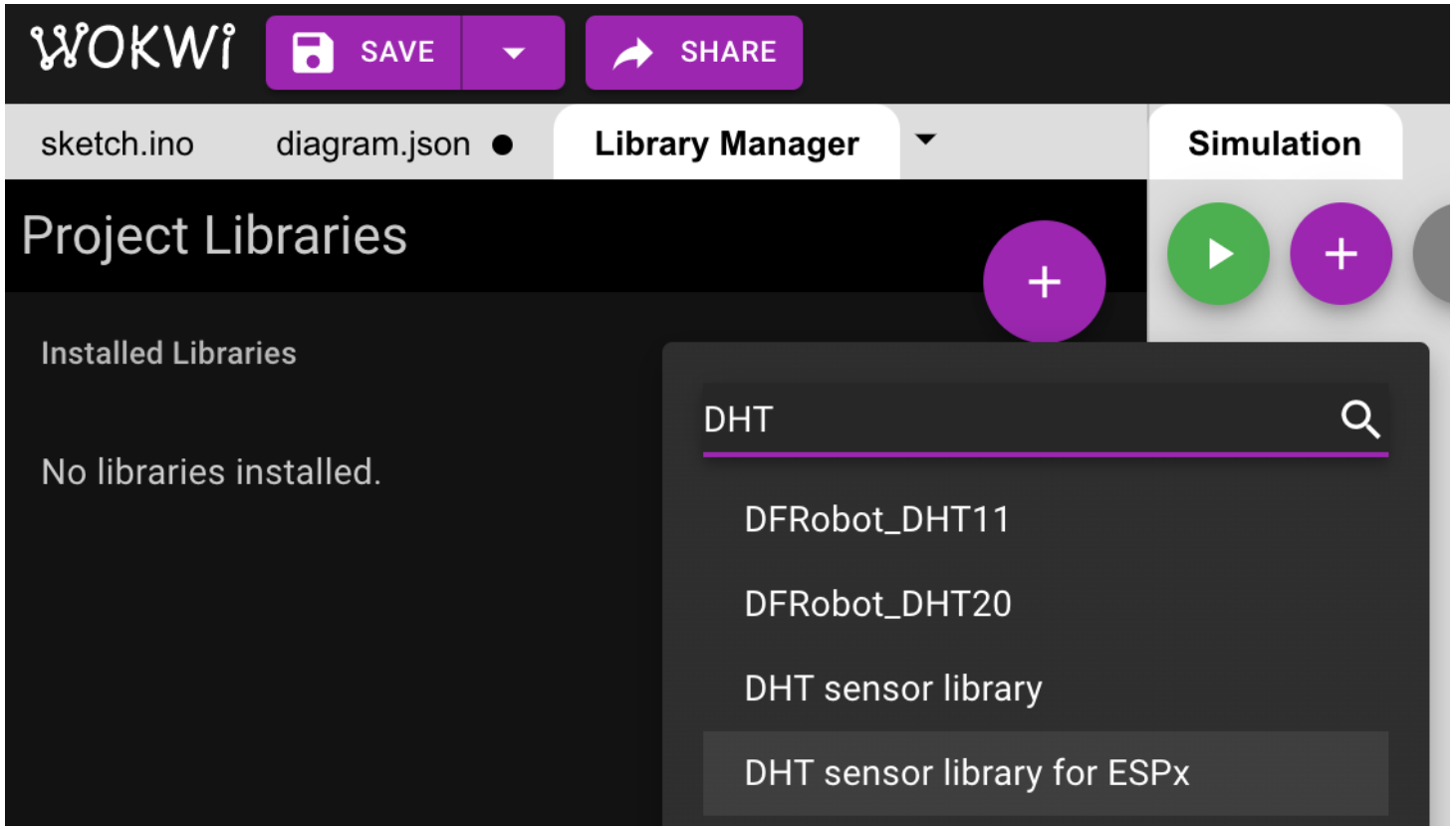
sketch.ino ● diagram.json ● libraries.txt Library Manager

```
1   void setup() {
2     // put your setup code here, to run
3     pinMode(2, OUTPUT);
4   }
5
6   void loop() {
7     // put your main code here, to run r
8     digitalWrite(2, HIGH);
9     delay(1000);
10    digitalWrite(2, LOW);
11    delay(1000);
12  }
13
```

Simulation



DHT22



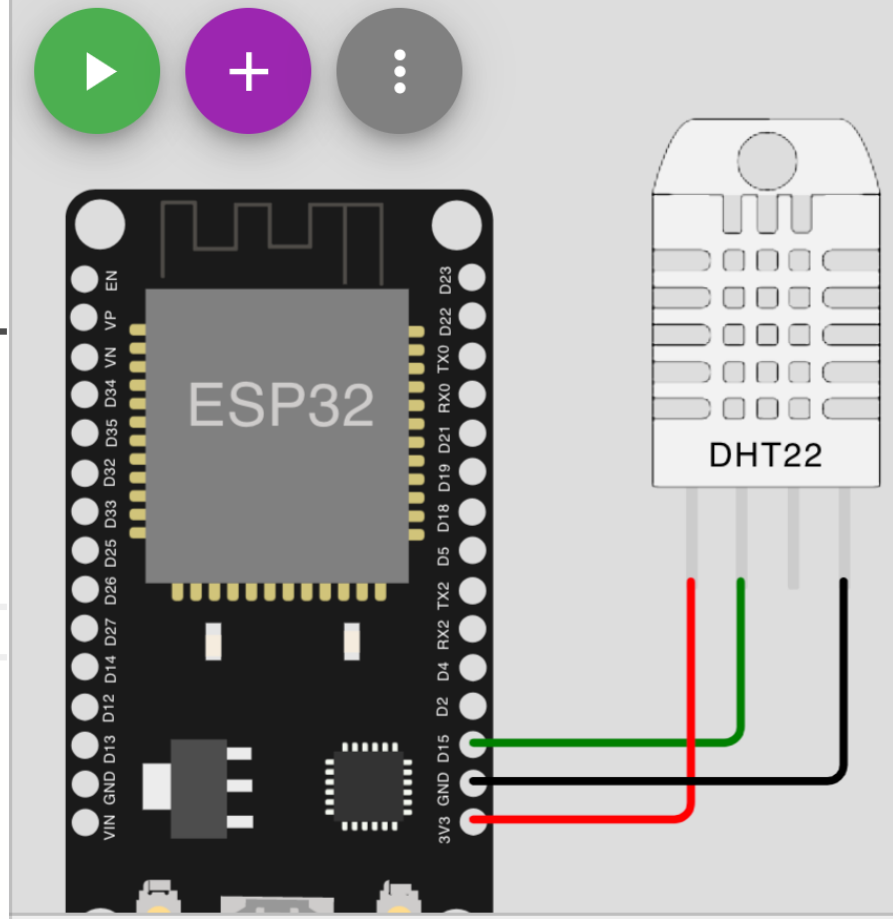
Add library

- 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);
}
```

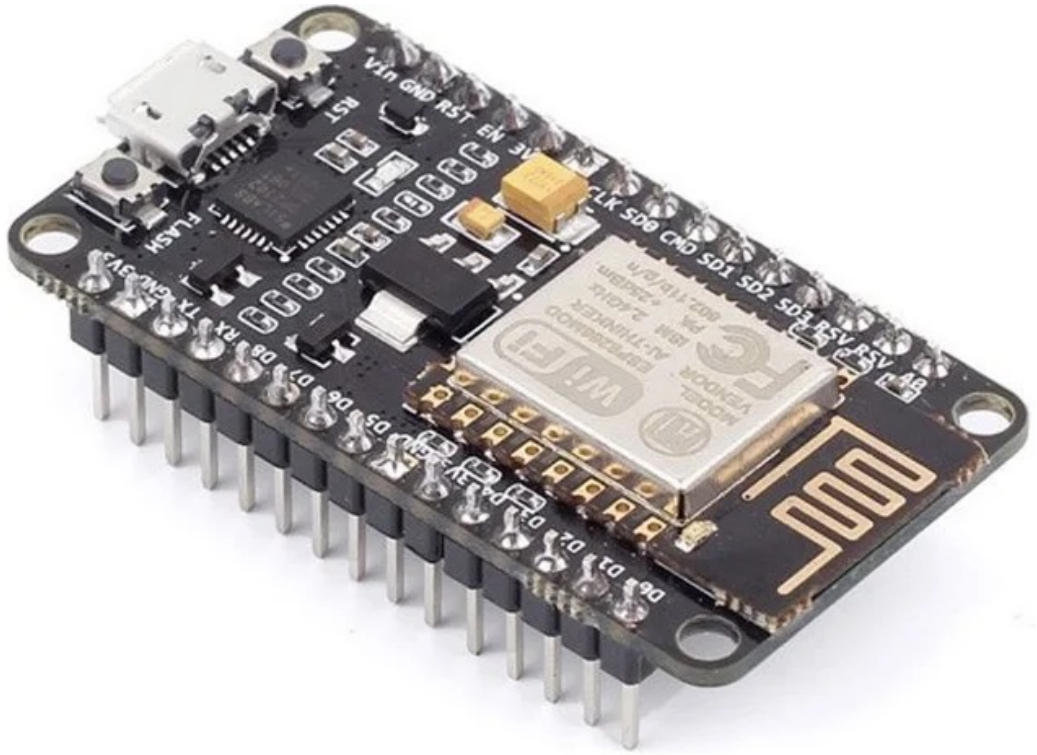
Simulation



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);
}
```