

How To Be a Maker Using ESP32

Altop

Lead Engineer at Widya Edutech

Trainer | IoT Engineer | Android developer

@helloaltop



I'm Not The Expert

Saya Hanya belajar Lebih Dulu

HOW TO BE A MAKER USING ESP32

and Create Your Own Solution

KMTek

For :
Beginner - Intermedience

Workshop Online Interaktif mempelajari bersama mengenai IoT melalui penggunaan dan penerapan ESP32. Bagi yang telah berpengalaman dalam Arduino IDE akan sangat mudah mengeksplor pengalaman baru menggunakan ESP32 di workshop ini.

Fasilitas

1. Softfile Workshop
2. Rekaman Workshop
3. 5 IoT Project Guidences
4. Konsultasi Project via grup WA
5. e-Sertifikat

Materi

1. Pengenalan IoT :
 - a. Hardware
 - b. Software
 - c. Connectivity
2. ESP32
3. Pengenalan System on Module (SoM)
4. Penerapan ESP32 untuk :
 - a. Smart Agriculture
 - b. Smart Home

**Perpanjangan Registrasi
sampai 3 Juli 2020**

Biaya : Rp. 50.000
bit.ly/kmtektworkshop

CP : Hilda 0858 7676 4266
Linda 0856 4151 7561



M. Ali Topan
- Lead Engineer



Sabtu, 4 Juli 2020
13.00 - 15.00 wib

Agenda

1. Deep Dive into Internet of Things
2. Getting Started with ESP32 DevKit
3. Send IoT Data to the Cloud
4. Visualize Your Data with Dashboards
5. Live Demo IoT Project

Dictionary

Search for a word



mak·er

/ˈmākər/

noun

plural noun: **makers**

1. a person or thing that makes or produces something.
"a cabinetmaker"

Similar:

creator

manufacturer

builder

constructor

producer



Don't Just Learn To Code, Learn To Create

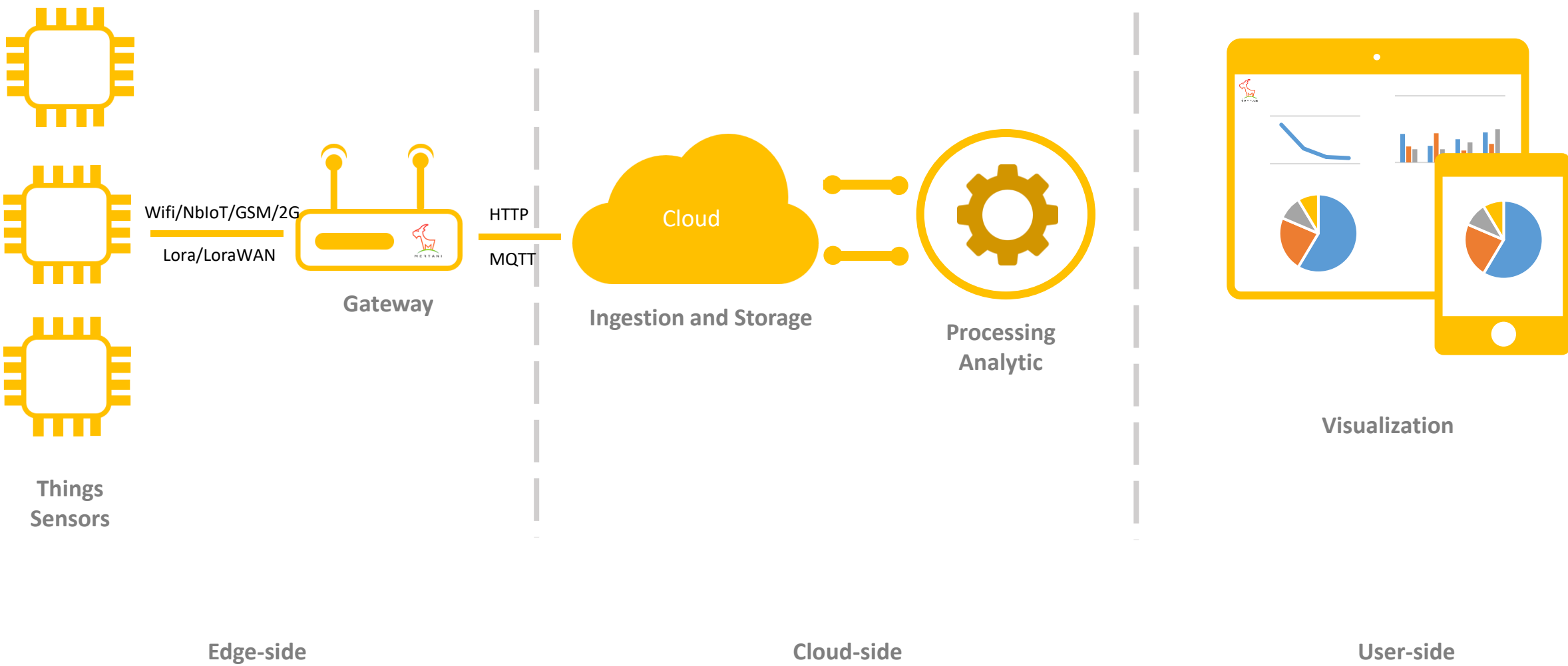
Justin Richards

Founder/CEO of Youth Digital that has taught over 40,000 students how to create with technology.

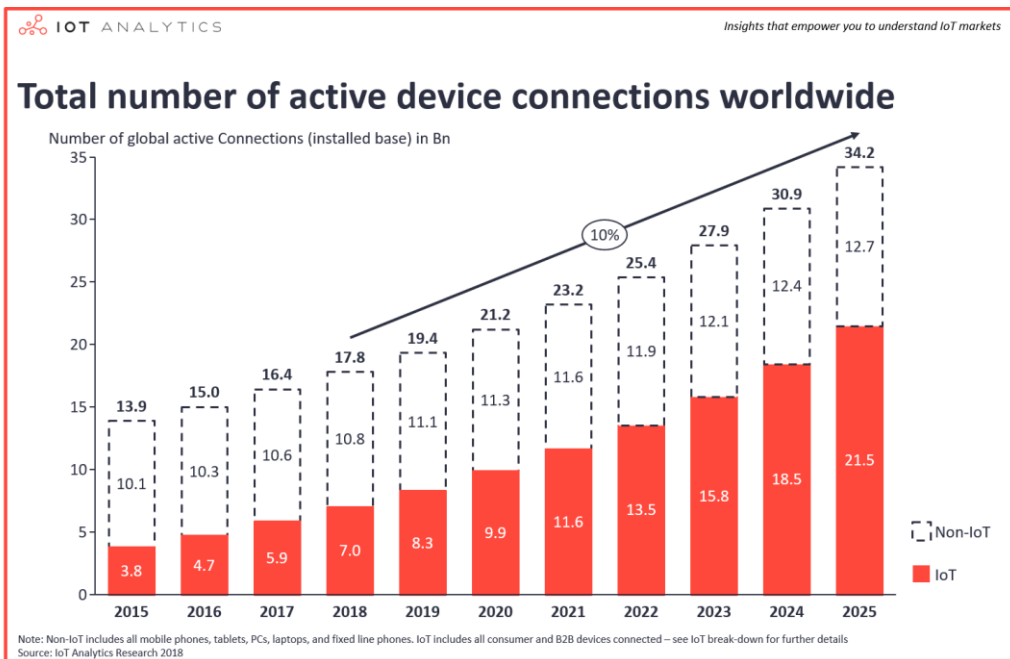


The Internet of Things, or IoT, refers to the billions of physical devices around the world that are now connected to the internet, all collecting and sharing data.

General IoT Architecture



Opportunity



What's Next

AIOT

Big Data Analitic

Prediction and Better
decision making

On Board LED
GPIO2

USB-UART
Bridge CP210X

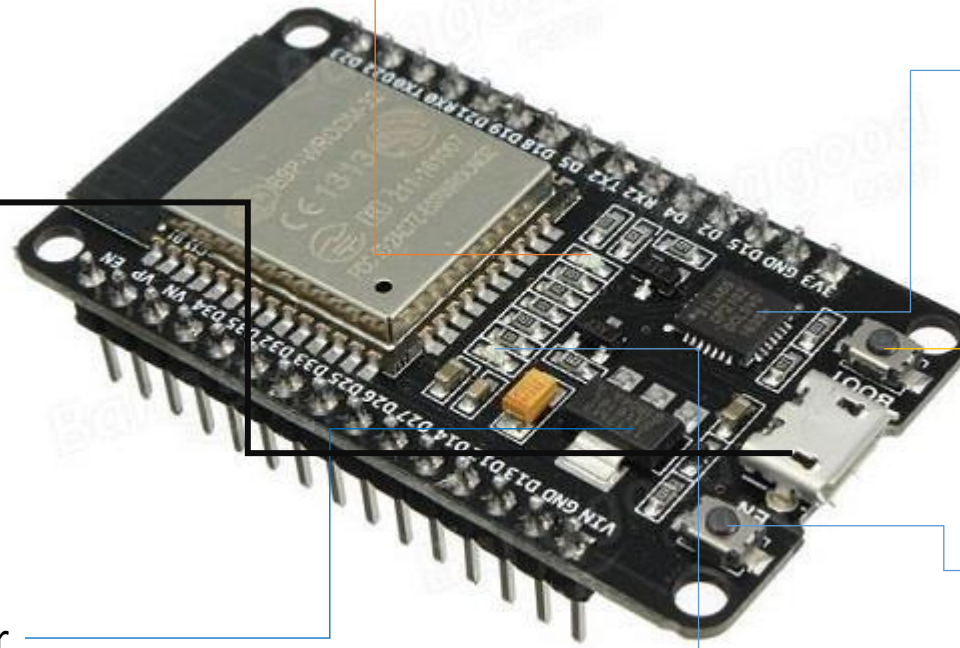
Boot Button

EN Button

Powe LED Indicator

3.3V Regulator

Micro USB Jack



ESP32

ESP32 vs ESP8266 vs Arduino UNO

SPECS	ESP32	ESP8266	Arduino UNO
Cores	2	1	1
Architecture	32 bit	32 bit	8 bit
CPU Freq	160 MHz	80 MHz	16 MHz
Wifi	ADA	ADA	Tidak Ada
Bluetooth	ADA	Tidak	Tidak
RAM	512 KB	160 KB	2 KB
Flash	16 MB	16 MB	32 KB
GPIO PIN	36	17	14
Busses	SPI, I2C, UART, I2S,CAN	SPI, I2C, UART, I2S	SPI,I2C,UART
ADC PINS	18	1	6
DAC Pins	2	0	0

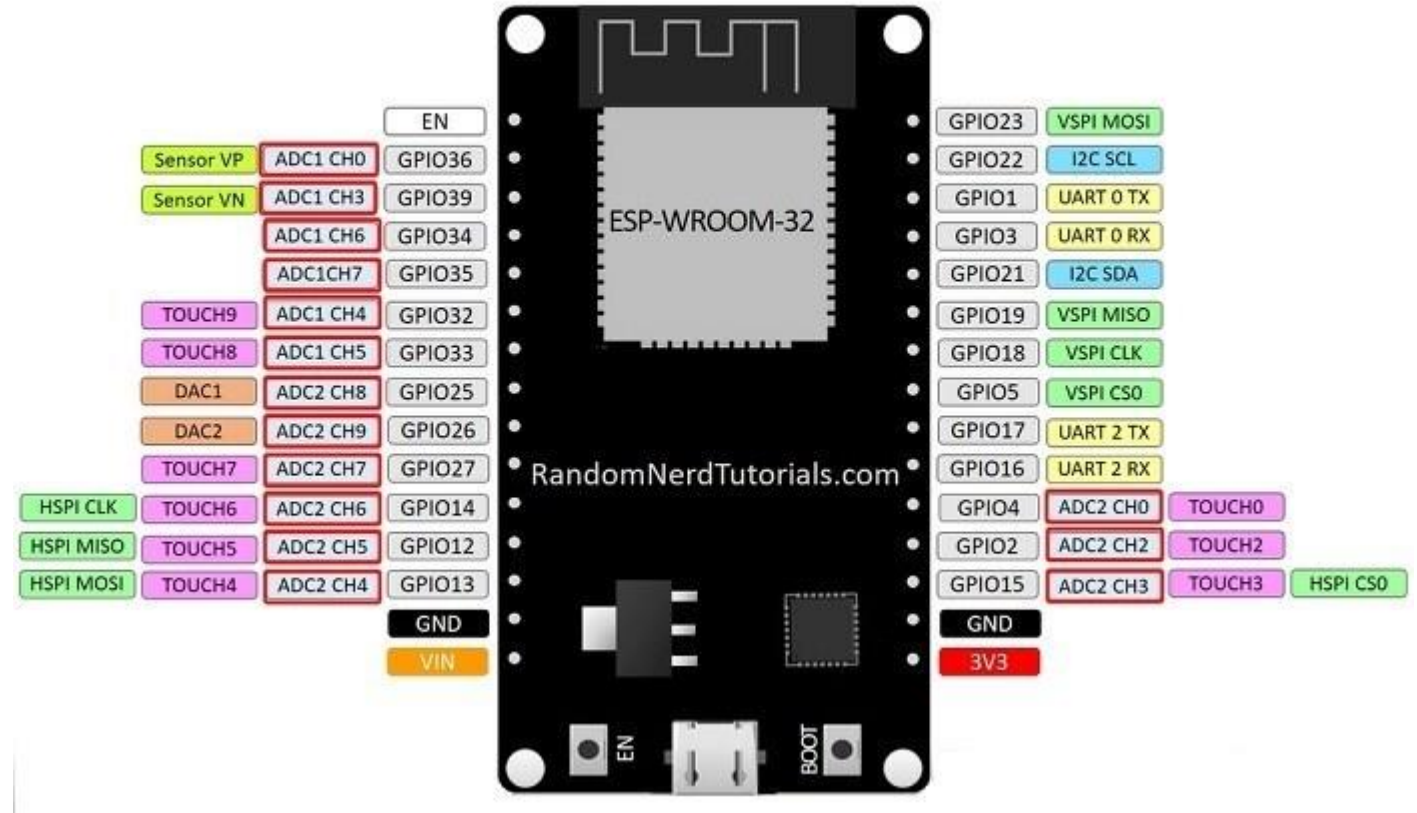
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GPIO PINOUT

ESP32 DEVKIT V1 - DOIT

ADC (ANALOG TO DIGITAL CONVERTER)

- ADC1_CH0 (GPIO 36)
- ADC1_CH1 (GPIO 37)
- ADC1_CH2 (GPIO 38)
- ADC1_CH3 (GPIO 39)
- ADC1_CH4 (GPIO 32)
- ADC1_CH5 (GPIO 33)
- ADC1_CH6 (GPIO 34)
- ADC1_CH7 (GPIO 35)
- ADC2_CH0 (GPIO 4)
- ADC2_CH1 (GPIO 0)
- ADC2_CH2 (GPIO 2)
- ADC2_CH3 (GPIO 15)
- ADC2_CH4 (GPIO 13)
- ADC2_CH5 (GPIO 12)
- ADC2_CH6 (GPIO 14)
- ADC2_CH7 (GPIO 27)
- ADC2_CH8 (GPIO 25)
- ADC2_CH9 (GPIO 26)

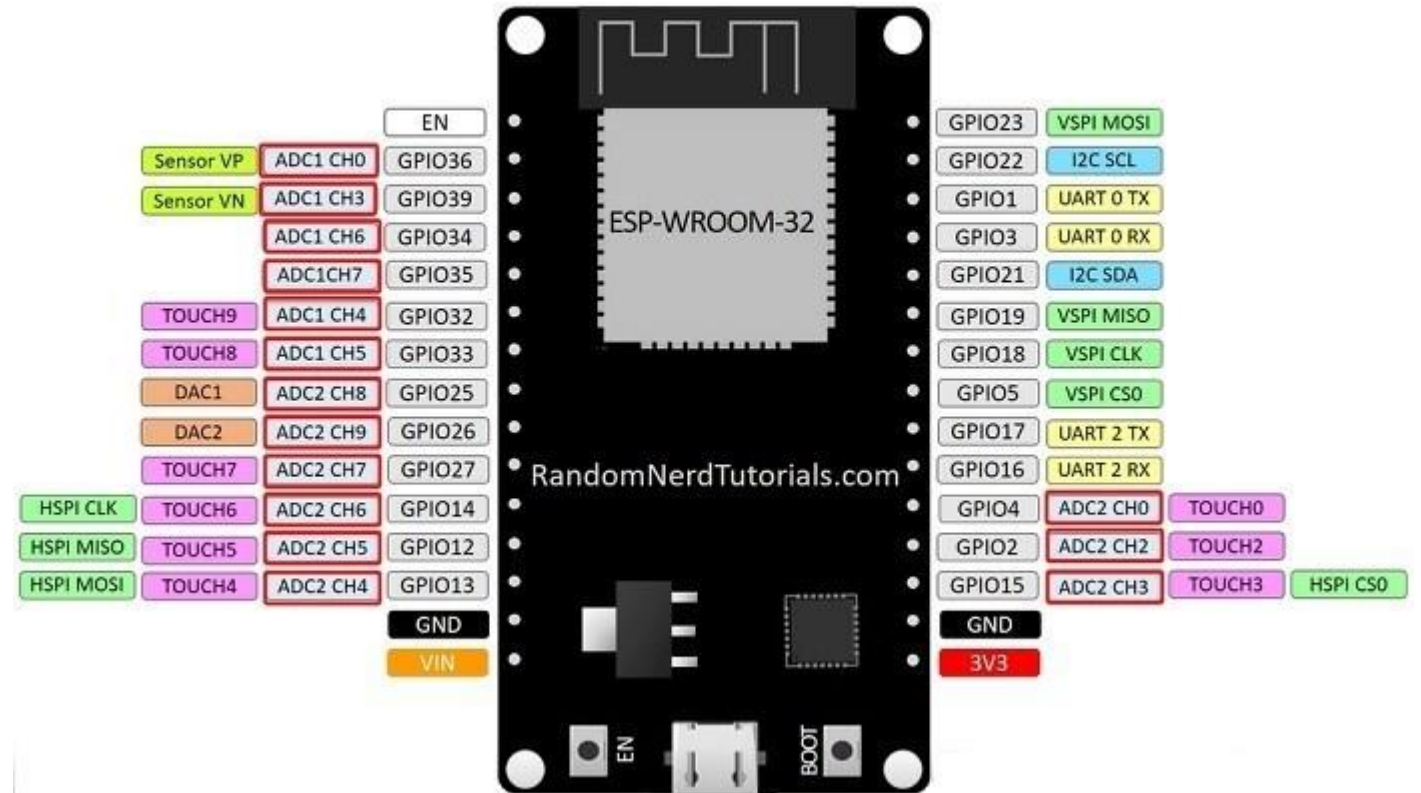


Catatan : Pin ADC2 tidak bisa digunakan ketika mengaktifkan Wi-Fi

ONLY INPUT

- GPIO 34
- GPIO 35
- GPIO 36
- GPIO 39

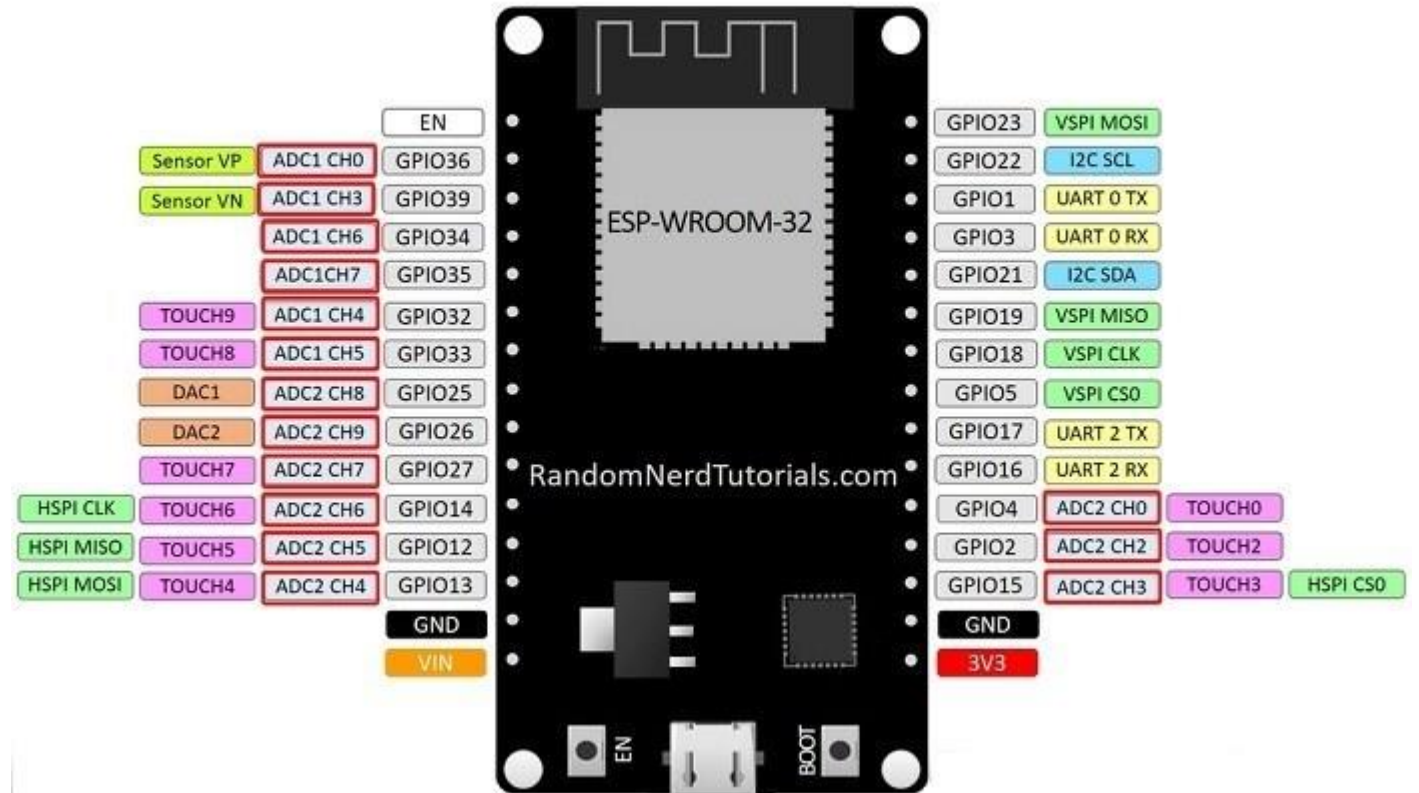
ESP32 DEVKIT V1 - DOIT



Pins with internal pull up INPUT_PULLUP

- GPIO14
- GPIO16
- GPIO17
- GPIO18
- GPIO19
- GPIO21
- GPIO22
- GPIO23

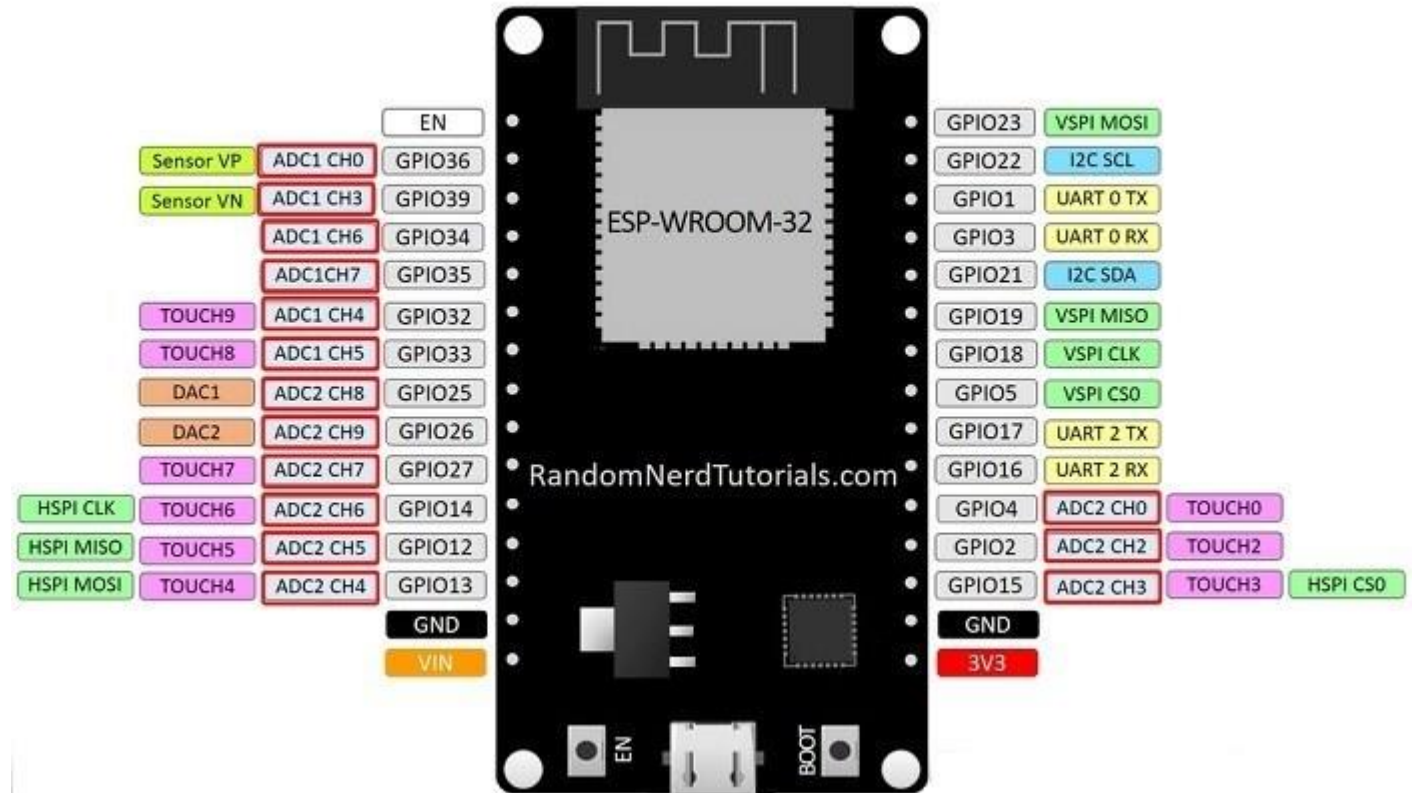
ESP32 DEVKIT V1 - DOIT



DAC (DIGITAL TO ANALOG CONVERTER)

- DAC1 (GPIO25)
- DAC2 (GPIO26)

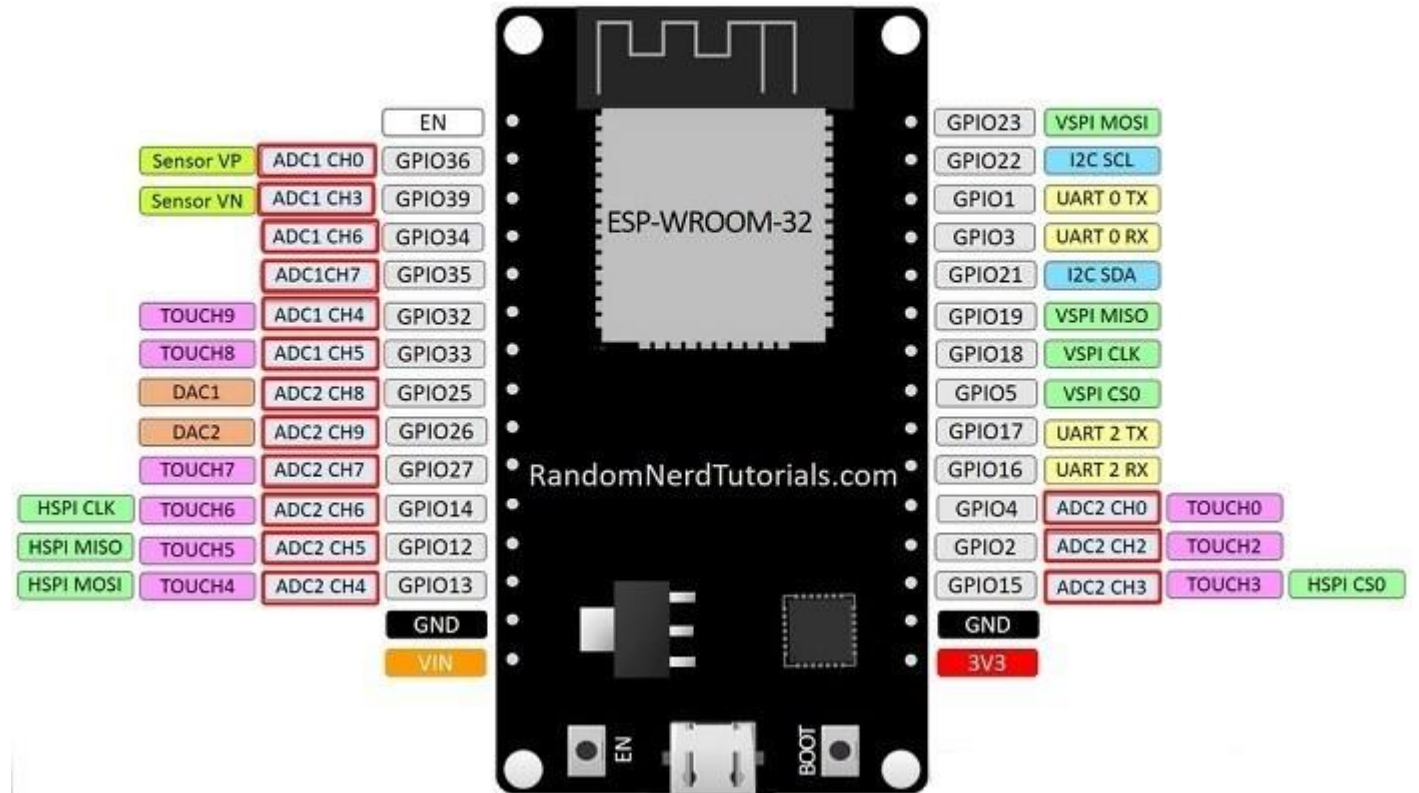
ESP32 DEVKIT V1 - DOIT



Serial UART

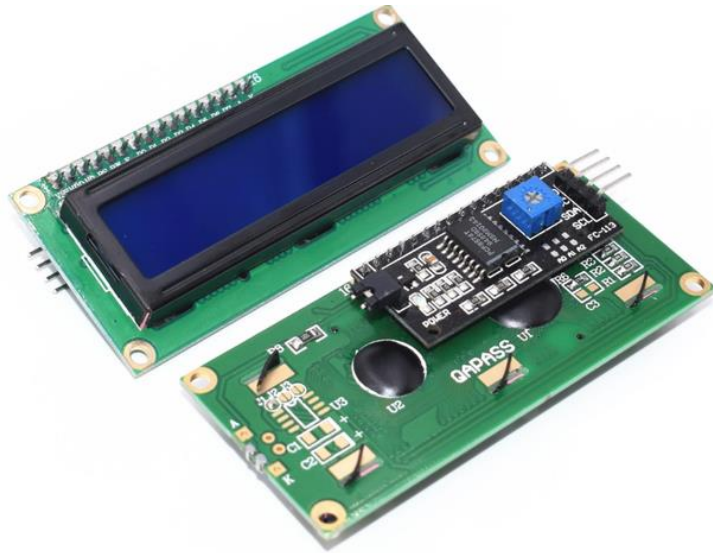
- GPIO3 (U0RXD)
- GPIO1(U0TXD)
- GPIO16 (U2RXD).
- GPIO17 (U2TXD).

ESP32 DEVKIT V1 - DOIT

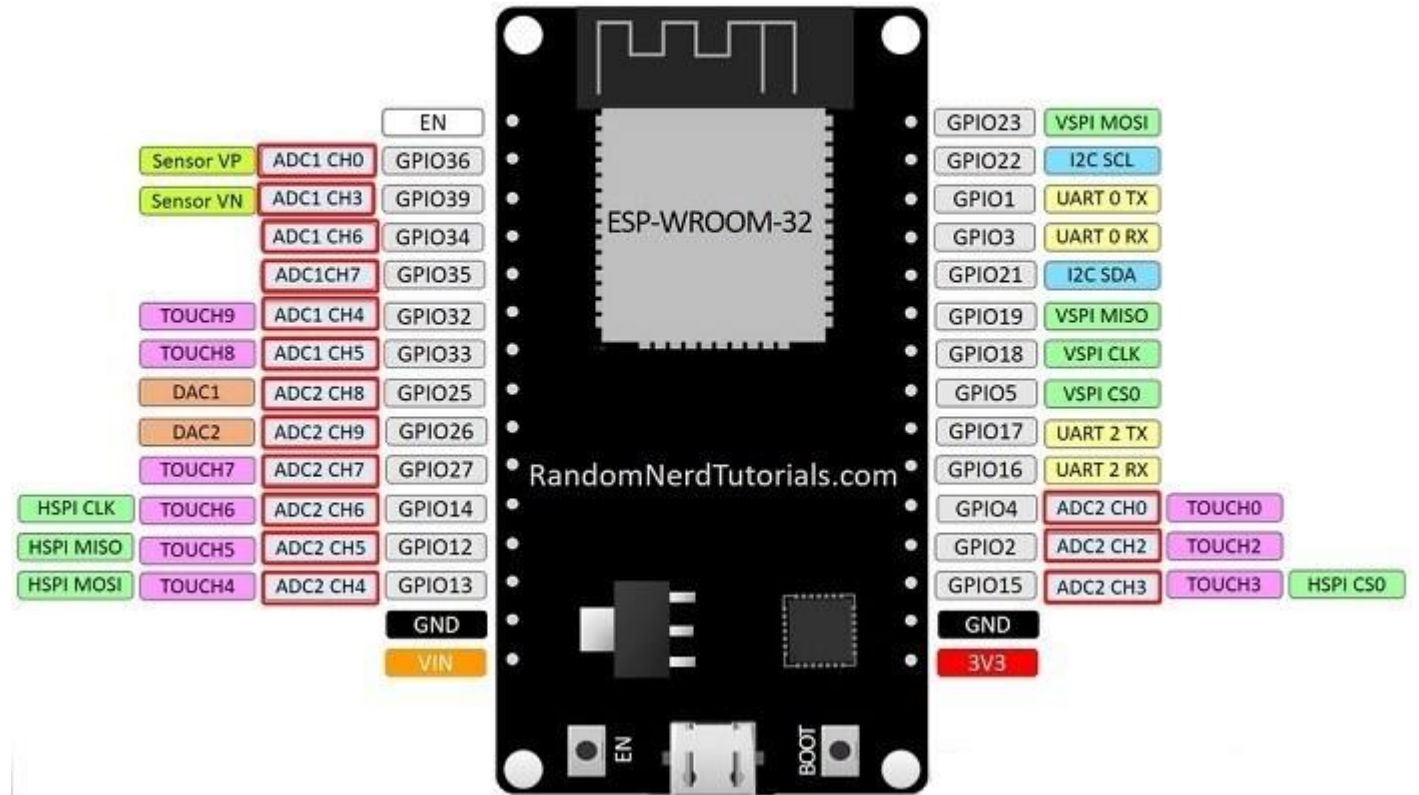


I2C (Inter-Integrated Circuit)

- GPIO 21 (SDA)
- GPIO 22 (SCL)

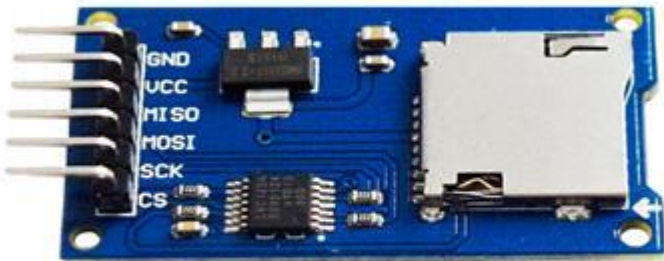


ESP32 DEVKIT V1 - DOIT

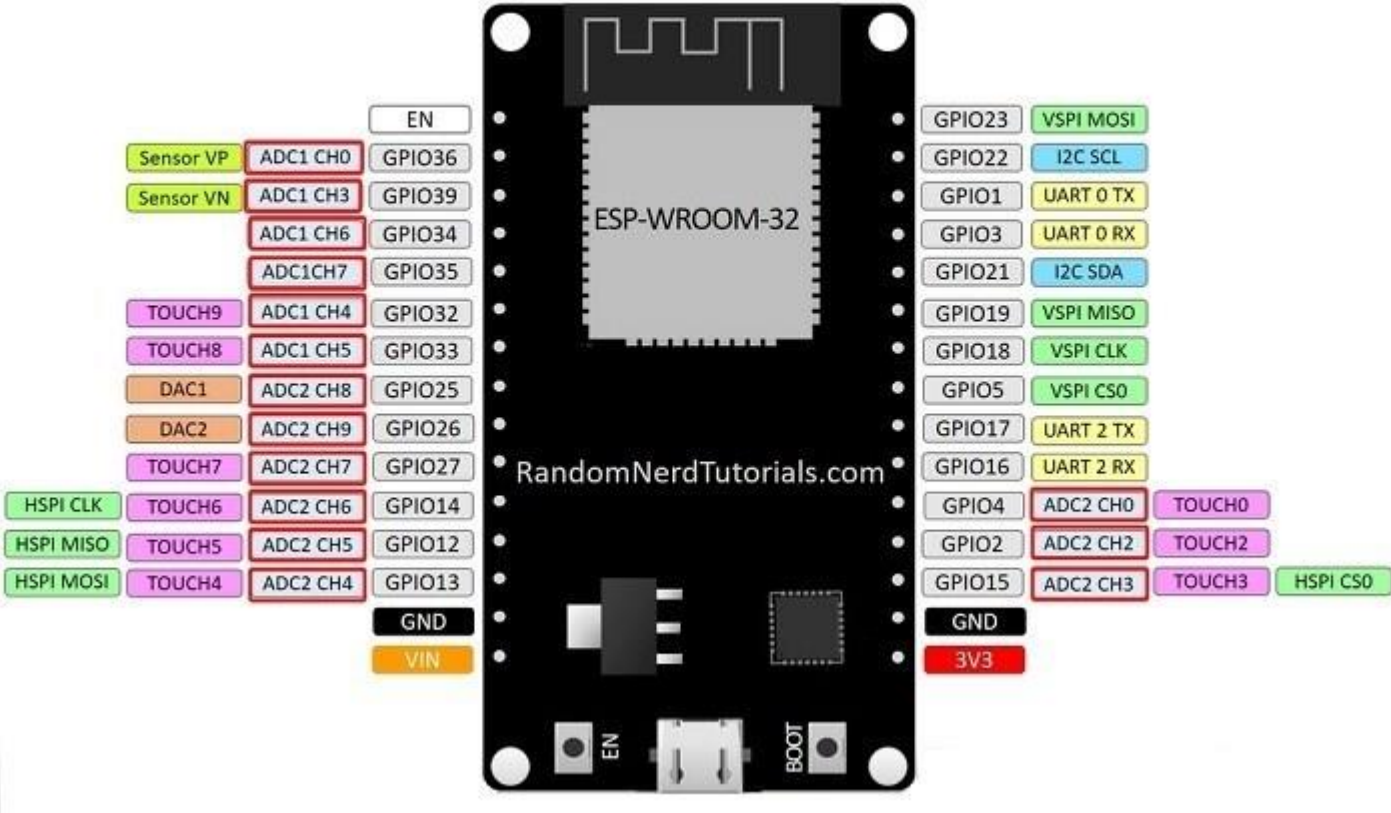


SPI (Serial Peripheral Interface)

SPI	MOSI	MISO	CLK	CS
VSPI	GPIO 23	GPIO 19	GPIO 18	GPIO 5
HSPI	GPIO 13	GPIO 12	GPIO 14	GPIO 15



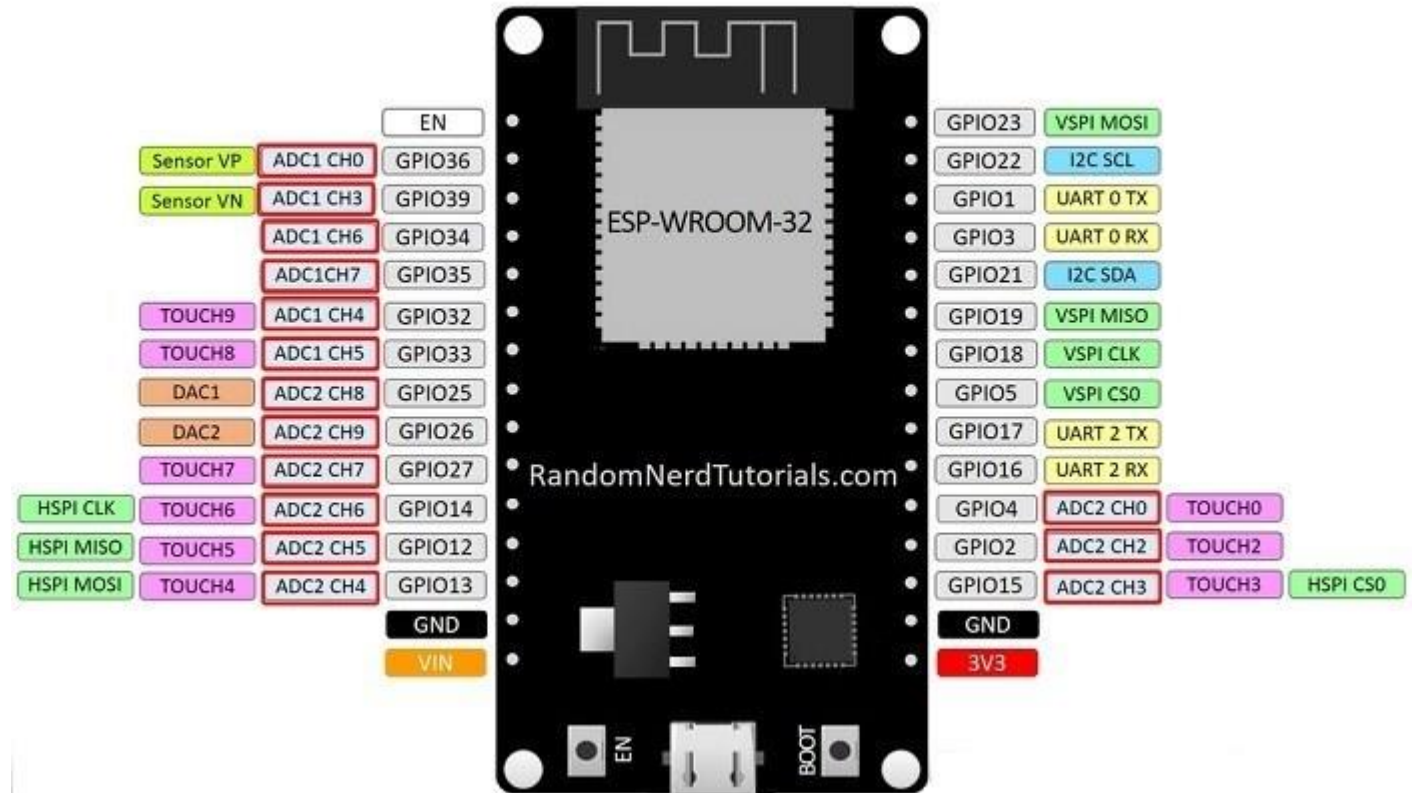
ESP32 DEVKIT V1 - DOIT



Interrupt

- Semua PIN

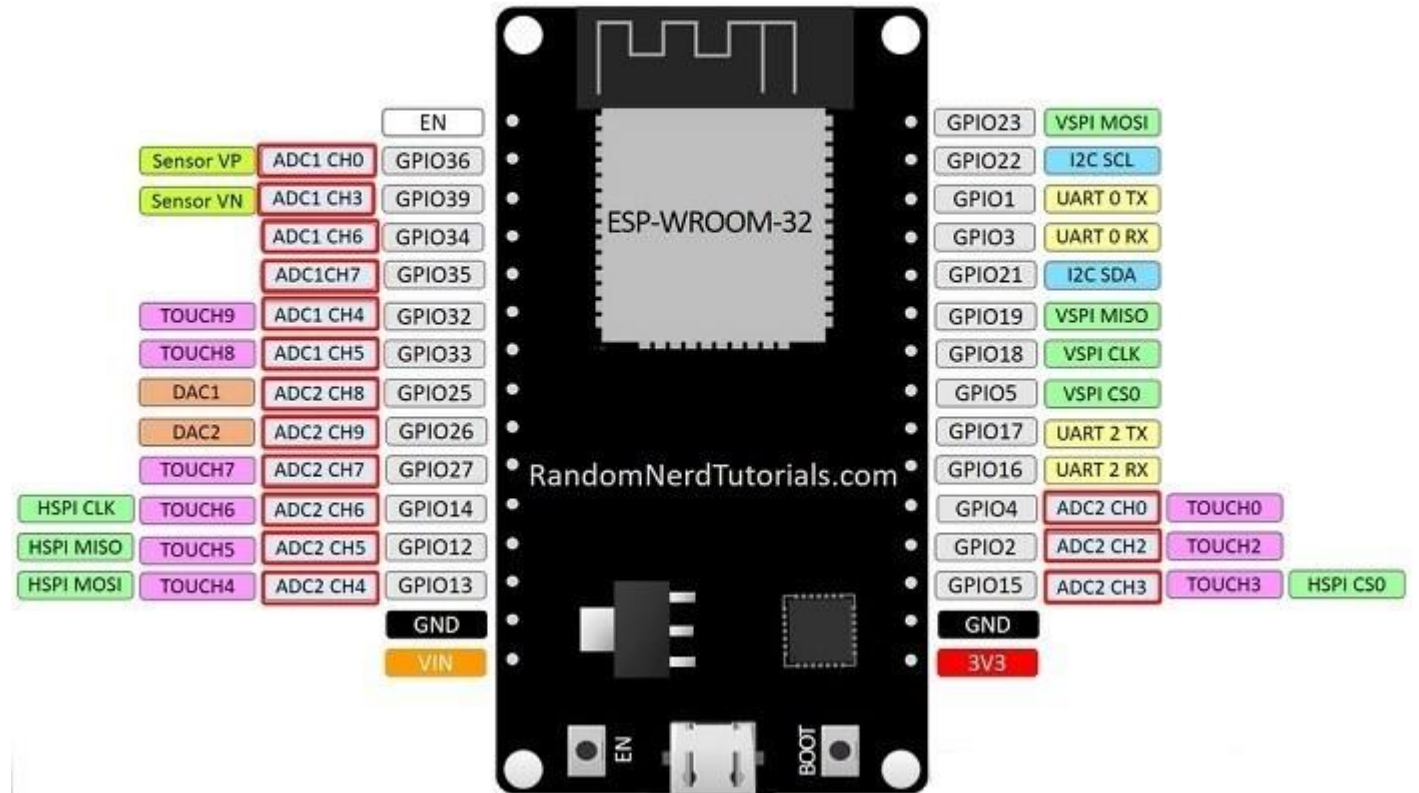
ESP32 DEVKIT V1 - DOIT



Strapping Pins

- GPIO 0
- GPIO 2
- GPIO 4
- GPIO 5 (must be HIGH during boot)
- GPIO 12 (must be LOW during boot)
- GPIO 15 (must be HIGH during boot)

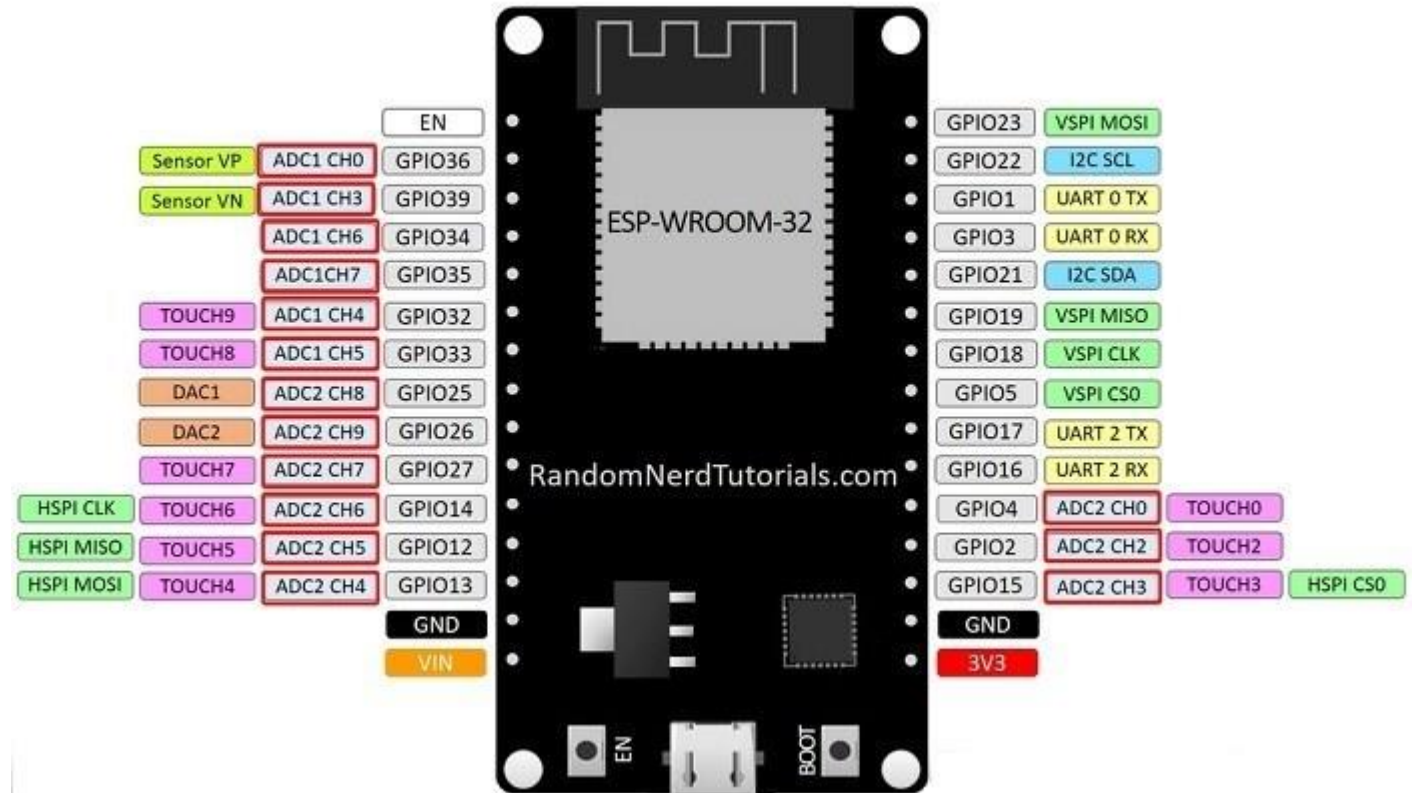
ESP32 DEVKIT V1 - DOIT



Pins HIGH at Boot

- GPIO 1
- GPIO 3
- GPIO 5
- GPIO 6 to GPIO 11 (connected to the ESP32 integrated SPI flash memory – not recommended to use).
- GPIO 14
- GPIO 15

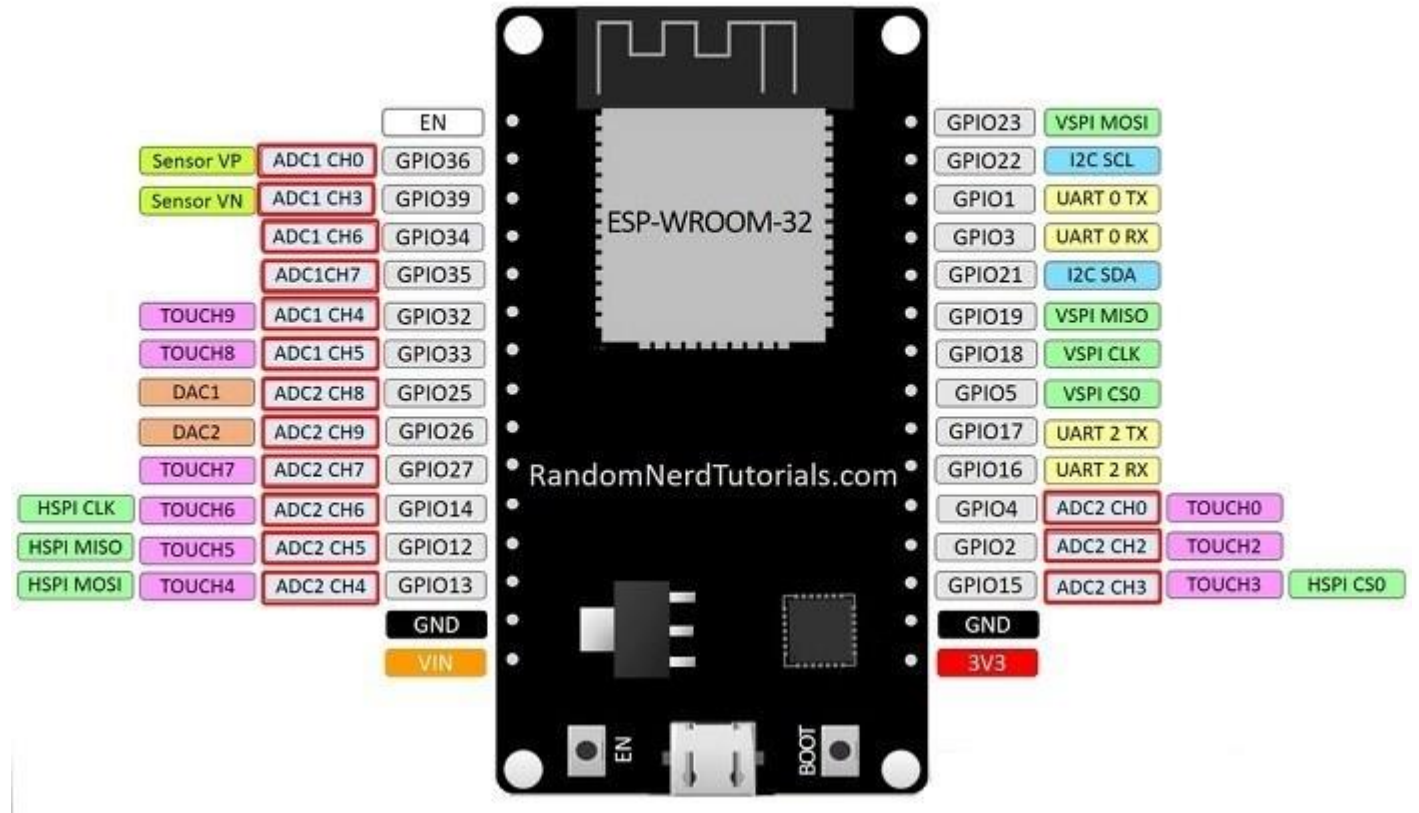
ESP32 DEVKIT V1 - DOIT



Capacitive touch

- T0 (GPIO 4)
- T1 (GPIO 0)
- T2 (GPIO 2)
- T3 (GPIO 15)
- T4 (GPIO 13)
- T5 (GPIO 12)
- T6 (GPIO 14)
- T7 (GPIO 27)
- T8 (GPIO 33)
- T9 (GPIO 32)

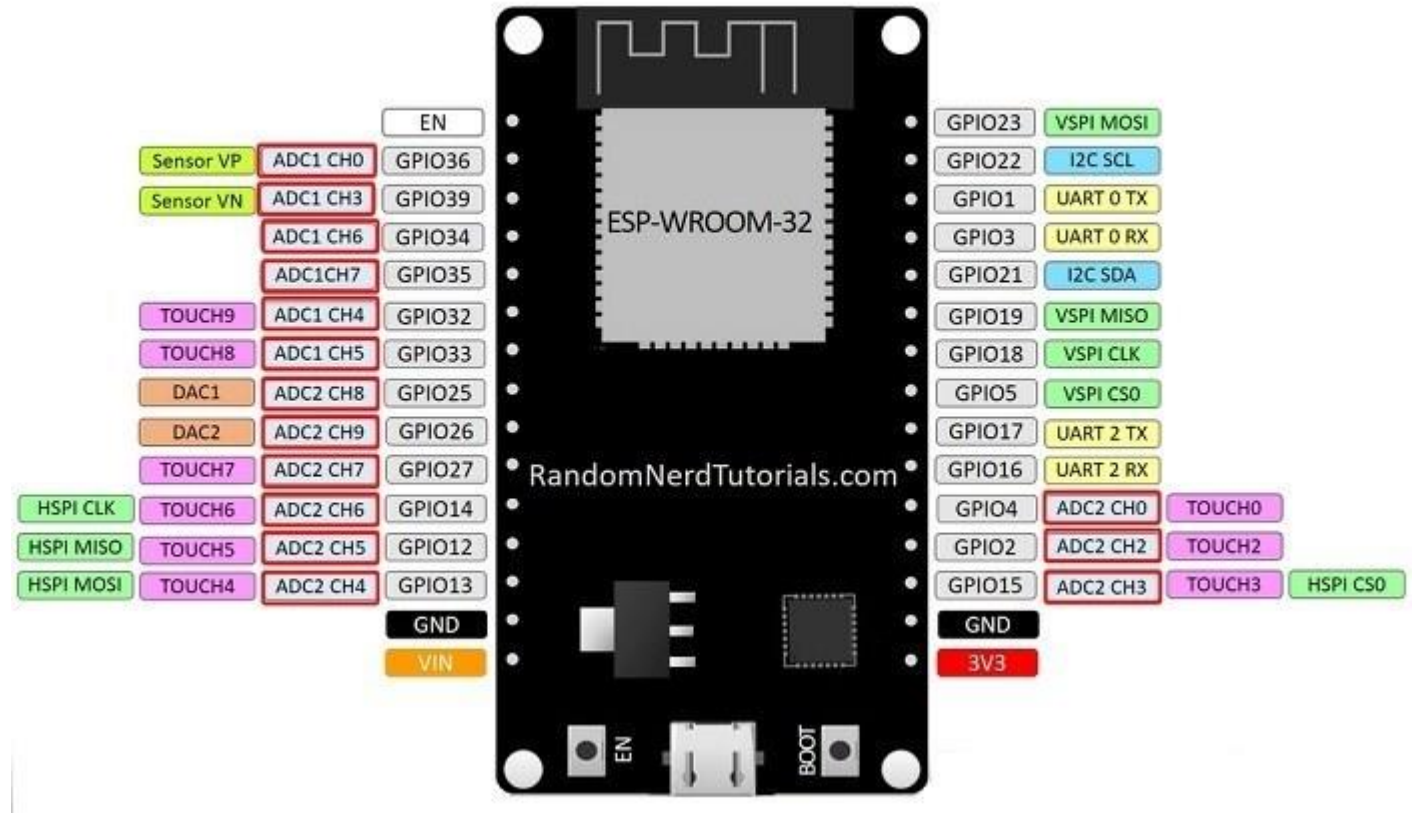
ESP32 DEVKIT V1 - DOIT

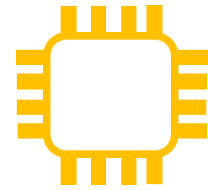


RTC

- RTC_GPIO0 (GPIO36)
- RTC_GPIO3 (GPIO39)
- RTC_GPIO4 (GPIO34)
- RTC_GPIO5 (GPIO35)
- RTC_GPIO6 (GPIO25)
- RTC_GPIO7 (GPIO32)
- RTC_GPIO8 (GPIO33)
- RTC_GPIO9 (GPIO32)
- RTC_GPIO10 (GPIO4)
- RTC_GPIO11 (GPIO0)
- RTC_GPIO12 (GPIO2)
- RTC_GPIO13 (GPIO15)
- RTC_GPIO14 (GPIO13)
- RTC_GPIO15 (GPIO12)
- RTC_GPIO16 (GPIO14)
- RTC_GPIO17 (GPIO27)

ESP32 DEVKIT V1 - DOIT





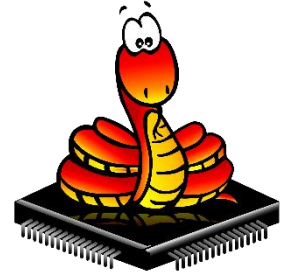
Set Up

ESP32 Development Platform



ARDUINO

ESP_IDF



MICRO PYTHON



Java Script

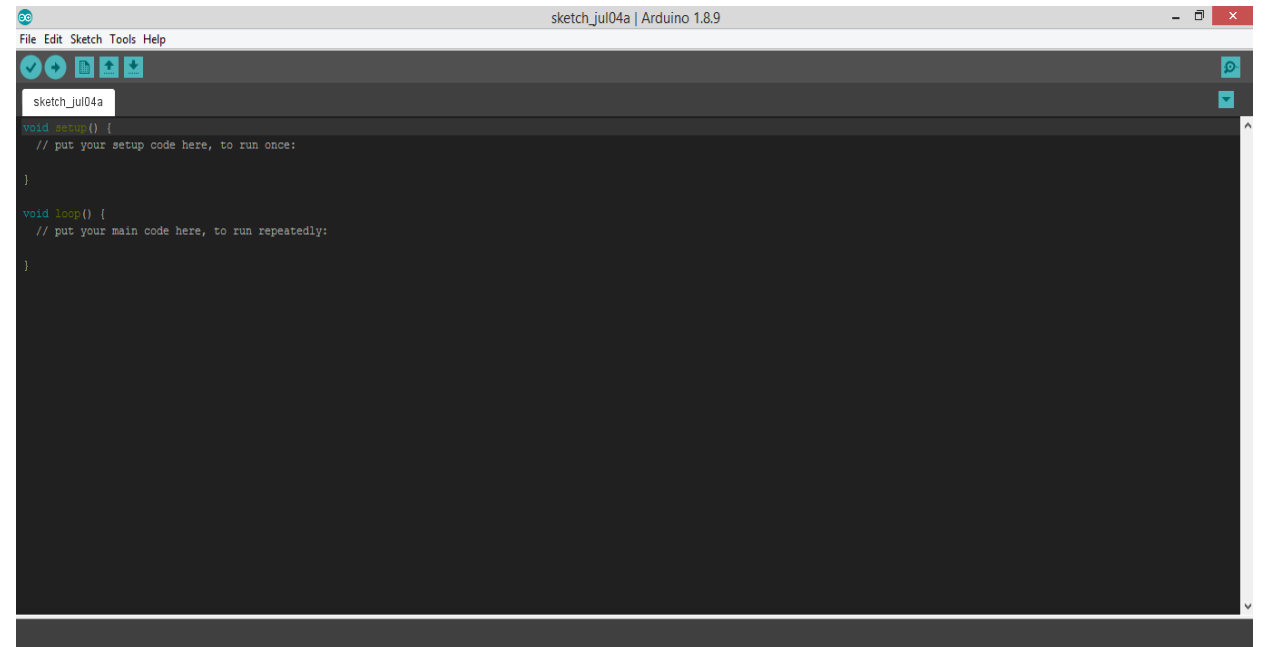
LUA

Lain Lain

Steps 1. Install Arduino IDE

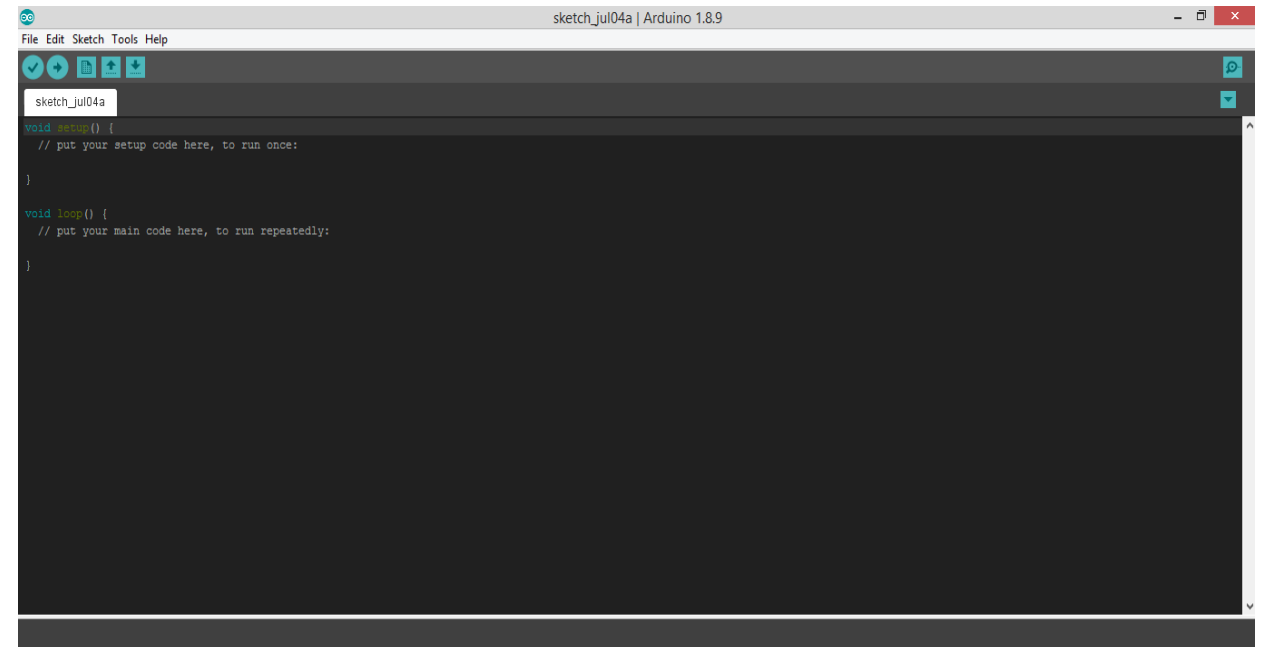


<https://www.arduino.cc/en/main/software>



Steps 2. Install Board ESP32 on Arduino IDE

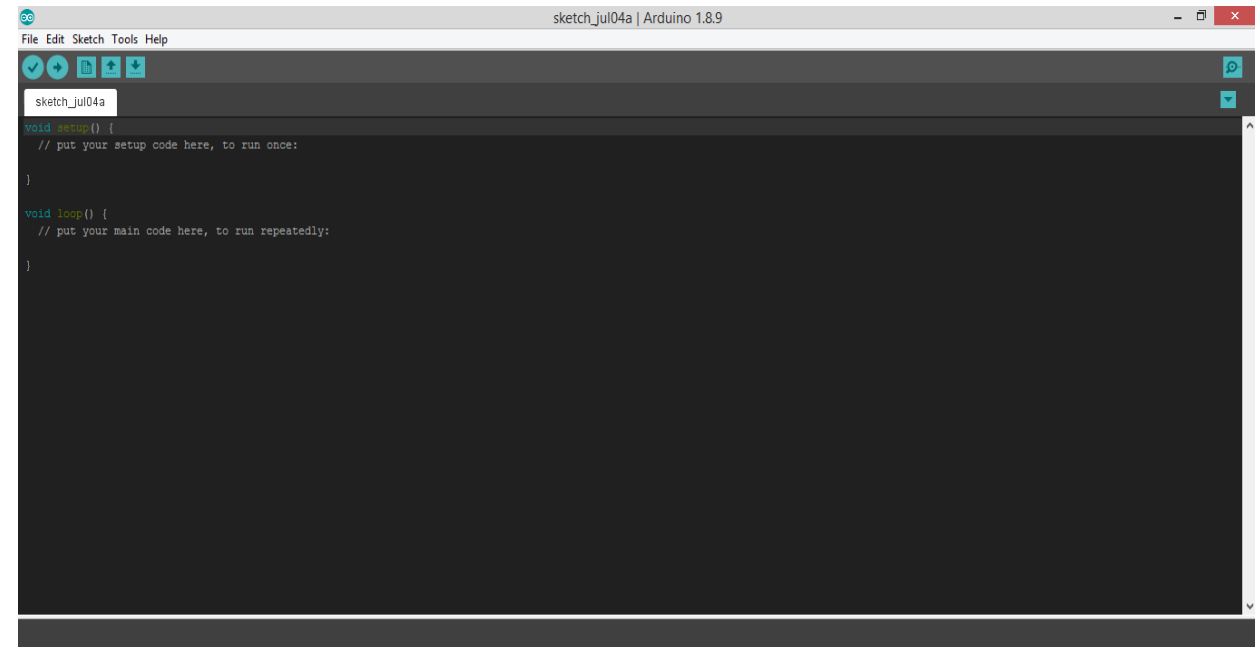
1. Copy Paste URL ke File/Preference/Additional Board Manager
https://dl.espressif.com/dl/package_esp32_index.json
2. Masuk ke Tools/Board/Board Manager dan Install ESP32

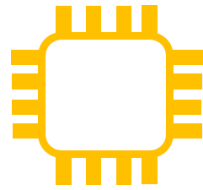


Steps 3. Hubungkan ESP 32 ke Komputer menggunakan Kabel USB

Pastikan Sudah menginstall Driver USB to Serial . Jika belum silahkan download melalui laman <https://www.silabs.com/products/development-tools/software/usb-to-uart-bridge-vcp-drivers>

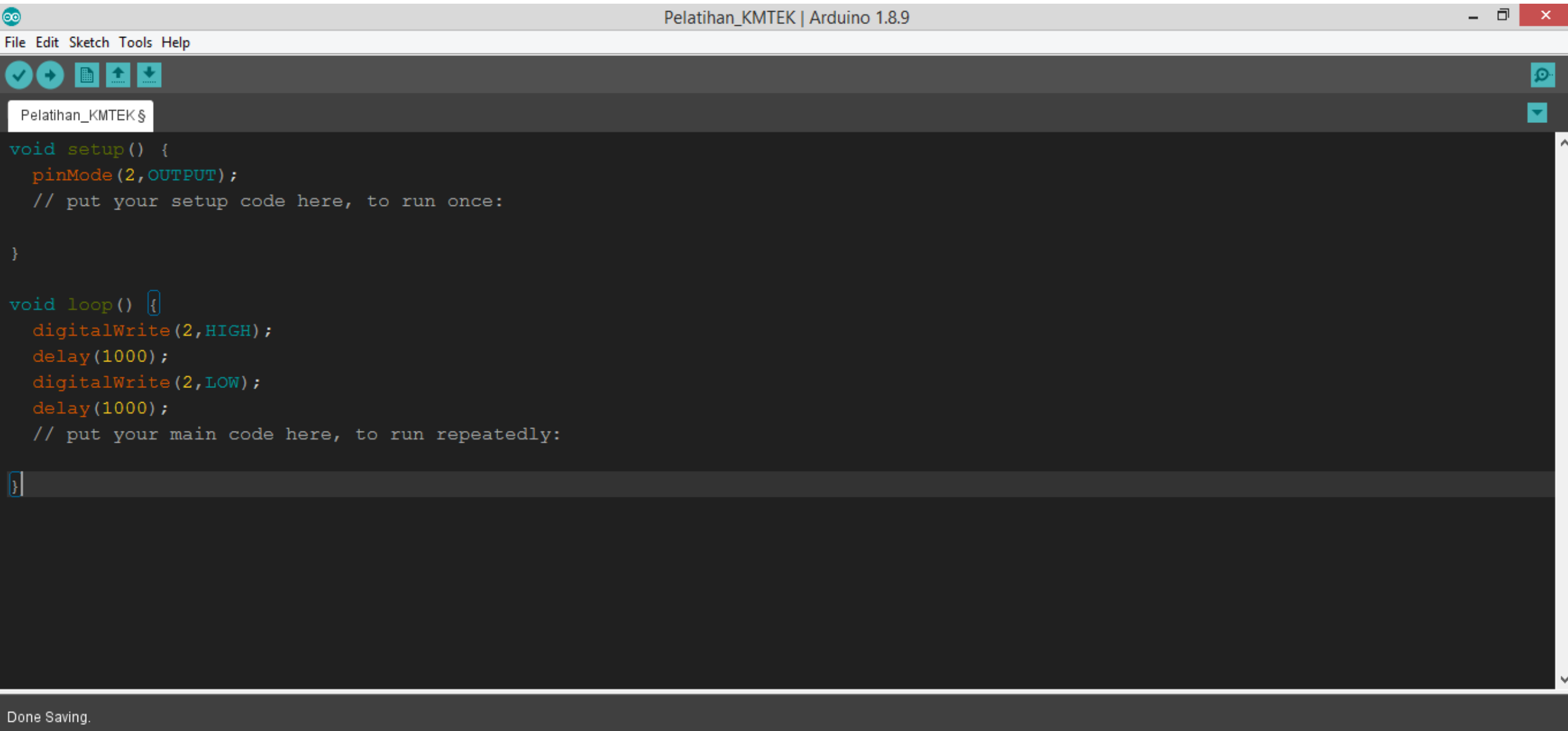
Sesuaikan dengan Jenis Board ESP32 yang dimiliki





Let's Code

Blink Test

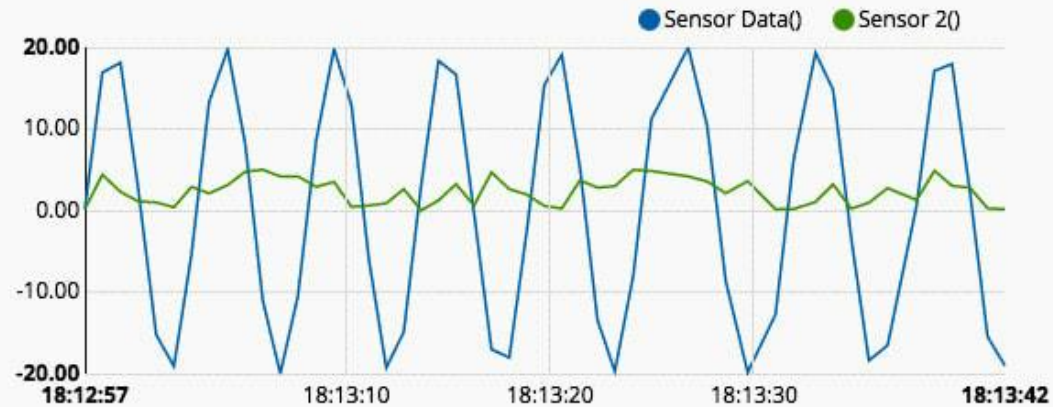




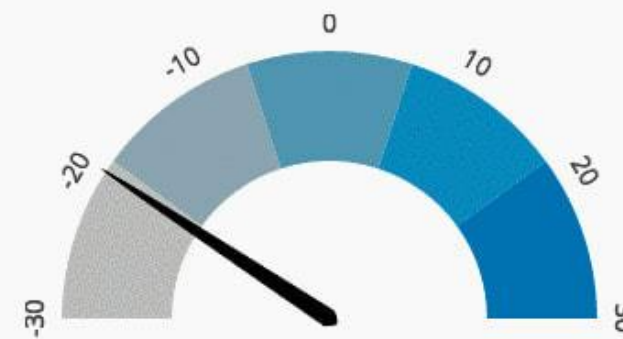
Send IoT Data to the Cloud

My Dashboard

Sensor Data



Sensor A



Sensor B

On average, Sensor B was

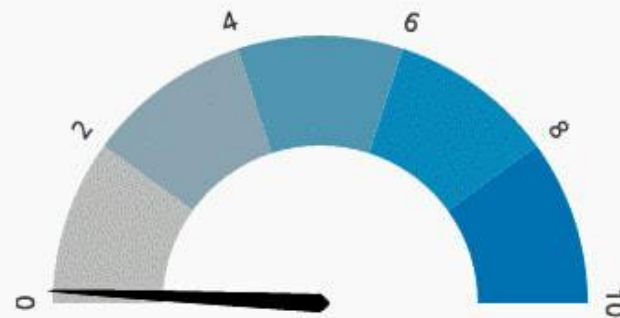
1.25

today

Last values table

Variable name	Date	Last value
Sensor Data	March 29 2016 at 18:13:42	-19.02
Sensor 2	March 29 2016 at 18:13:42	0.14385473783820305

Sensor B



Sensor A

Sensor Data

Off

Sensor 2 ()

Turn Off

HTTP vs MQTT

