Literature on

“Getting started with ESP32”

Hof University of Applied Sciences

Master’s in Software Engineering for Industrial Application (M. Eng.)

Hochschule Hof

University of Applied Sciences

Written and instructed by
Aatif Shaikh,
Landwehrstaße 03,
95028, HOF
Germany

What is ESP32?

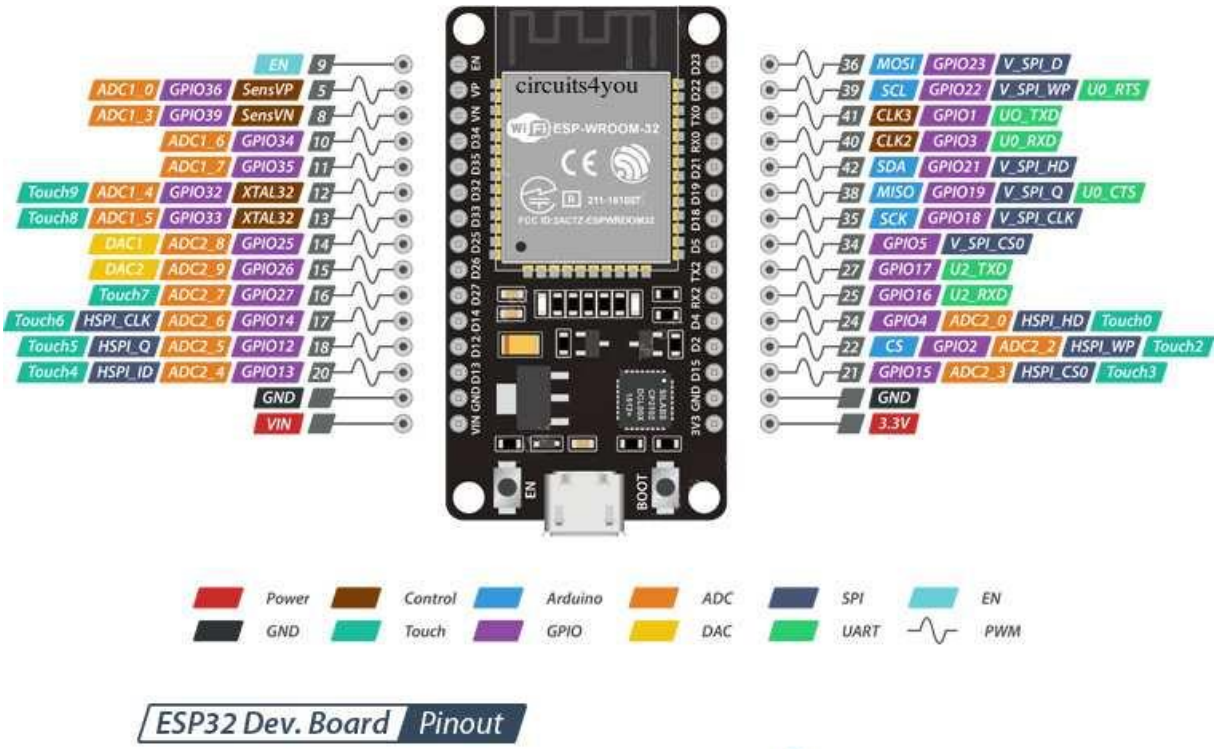


Image Source: https://circuits4you.com/2018/12/31/esp32-devkit-esp32-wroom-gpio-pinout/

ESP32 is a powerful yet surprisingly small module. It contains WIFI, Bluetooth, BLE, and several Industrial peripheral connectivity such as UART, SPI, I2C and PWM, which makes it highly applicable and easy to use in various applications in the industry. Additionally, it can run on up to 240Mhz clock, which is a very high speed in the Embedded domain.

In addition to that, over decades, globally, many people contributed and developed various libraries, plugins, supported hardware and so on. Now you can connect it to pretty much everything, and you can use it to build pretty much everything. There are many daughter boards, and headers are also available for ESP32, such as Ethernet-header and SD-card header.

Furthermore, initially, these modules require some high understanding of very low-level coding such as C/ C++ language. Nowadays, thank to many contributors, it is also possible to code these modules with Python language (micro-python). And with Python language, it is easy to do the coding even without knowledge or a deep understanding of the programming language.

For more details, please refer to the link https://circuits4you.com/2018/12/31/esp32-devkit-esp32-wroom-gpio-pinout/

Getting Started with ESP32

1. Installation

The first thing that you would require is Software through which you can download code into the ESP32. There are many different ways through which you could code in ESP32, but the most popular one is Arduino IDE.

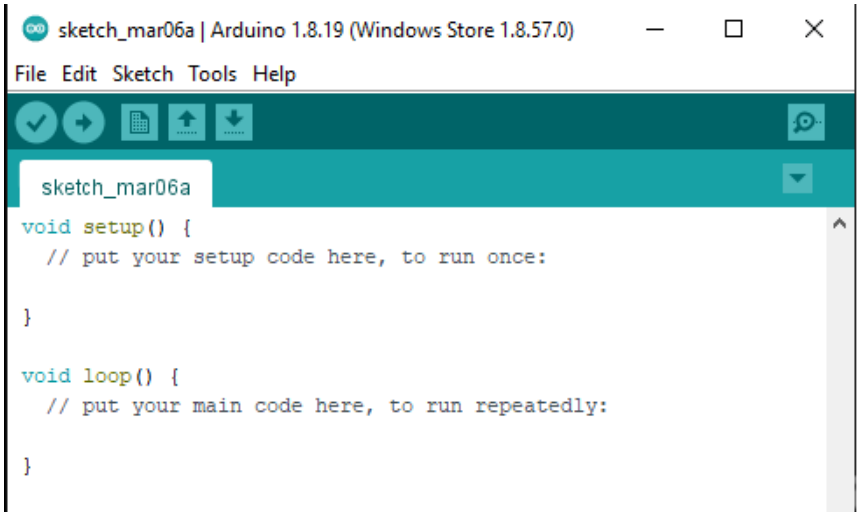
Other Softwares are:

1. Espressif IDF (IoT Development Framework)
2. Micropython
3. JavaScript

Step 1: Download

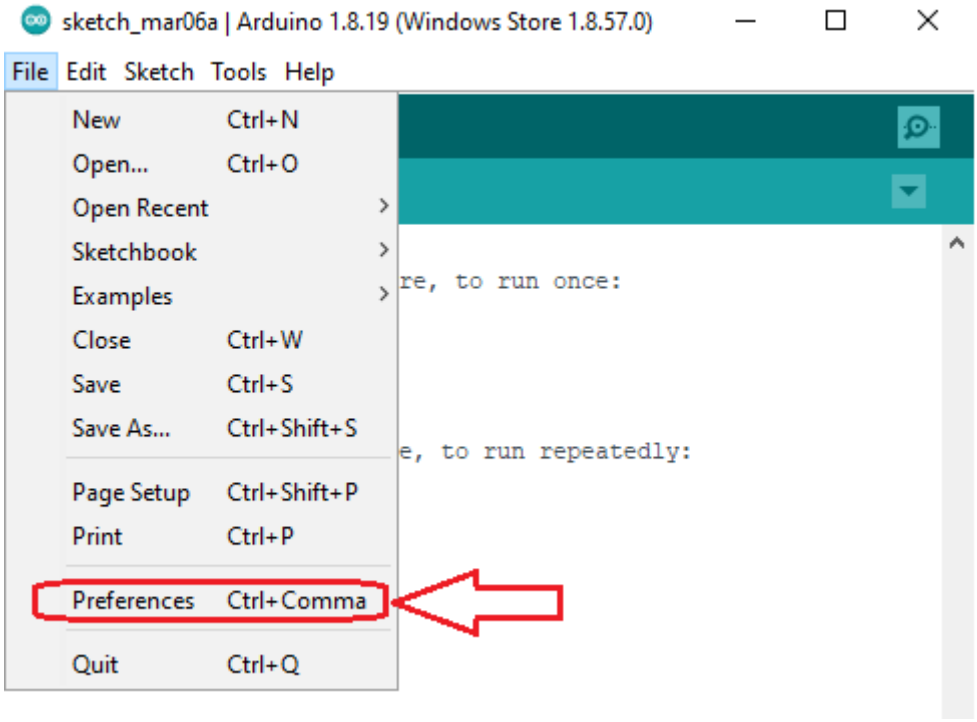
To download the software, go to the https://www.arduino.cc/en/software website and choose the software based on your Operating system. Please refer to the image attached below. Alternatively, you can also download it from https://www.filehorse.com/download-arduino/download/.

After the download completion, you will see an empty sketch of Arduino code.

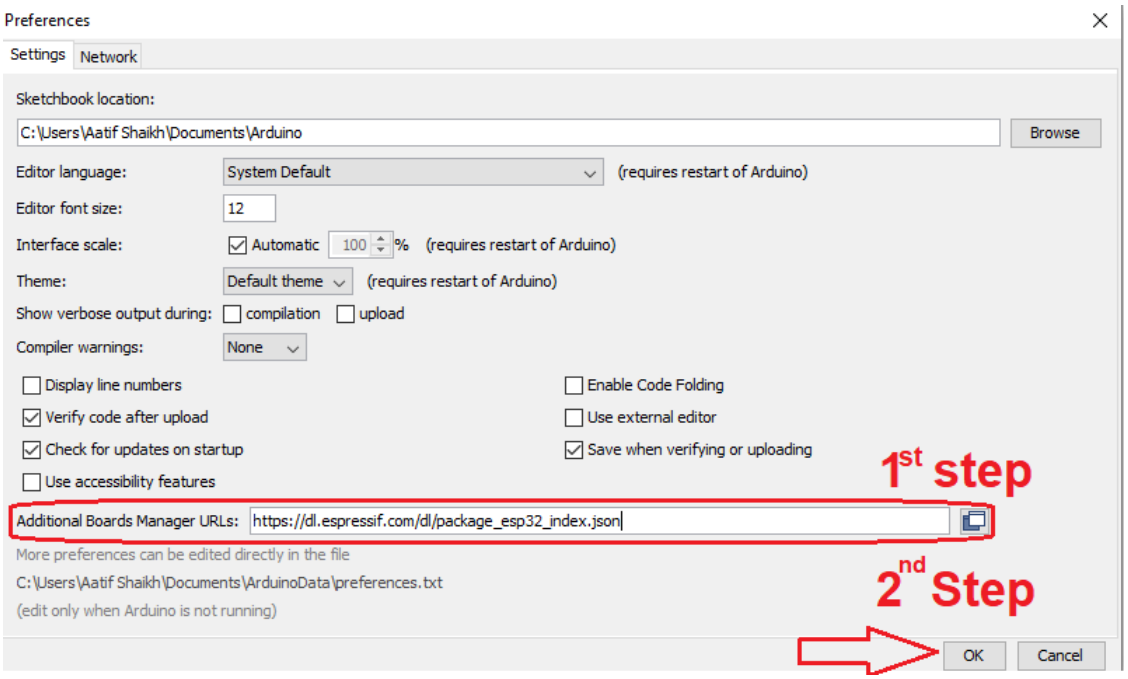


Step 2: Adding the ESP32 Library in Arduino IDE

Go to the **File -> Preferences**.

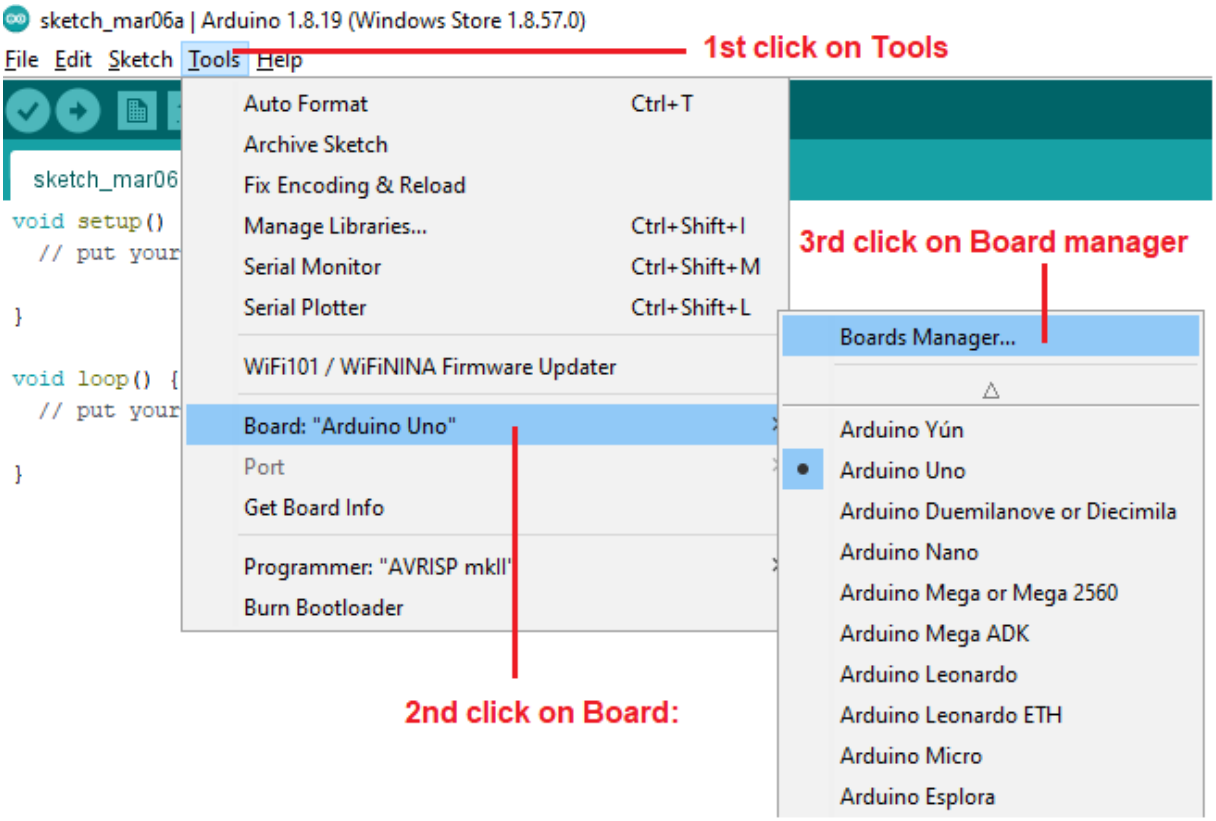


In the **Additional Board Manager URLs** add the link https://dl.espressif.com/dl/package_esp32_index.json and then press **OK**.

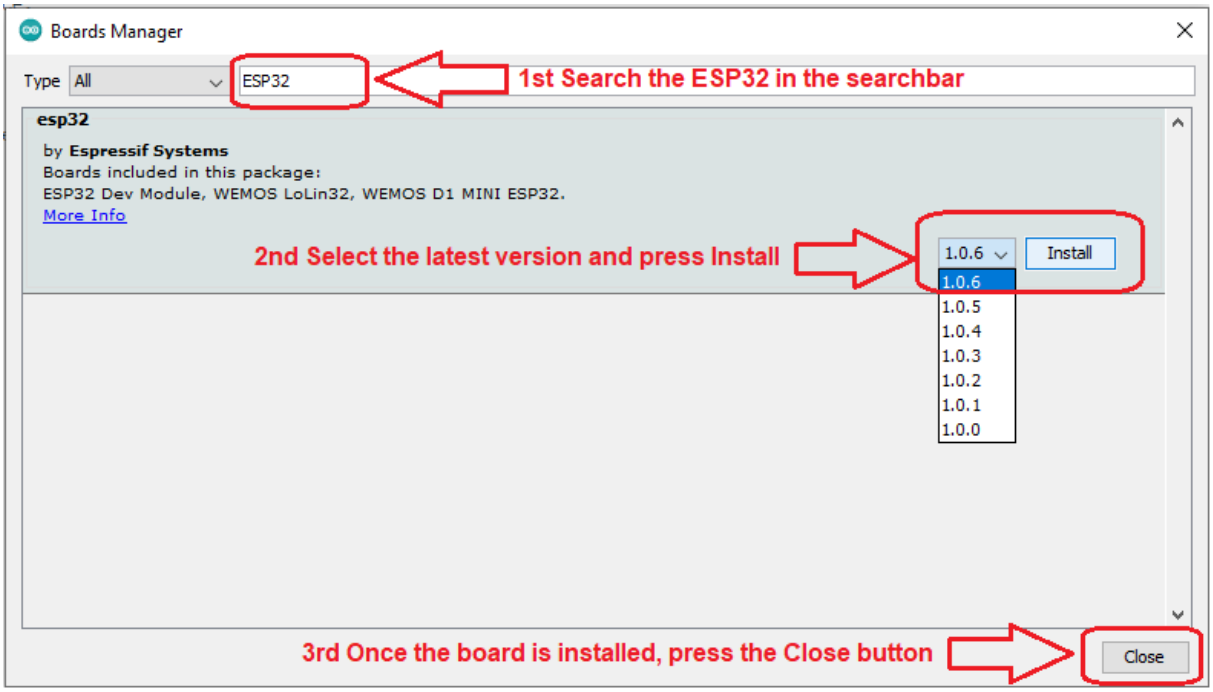


Step 3: Add the ESP32 Board in Board Manager

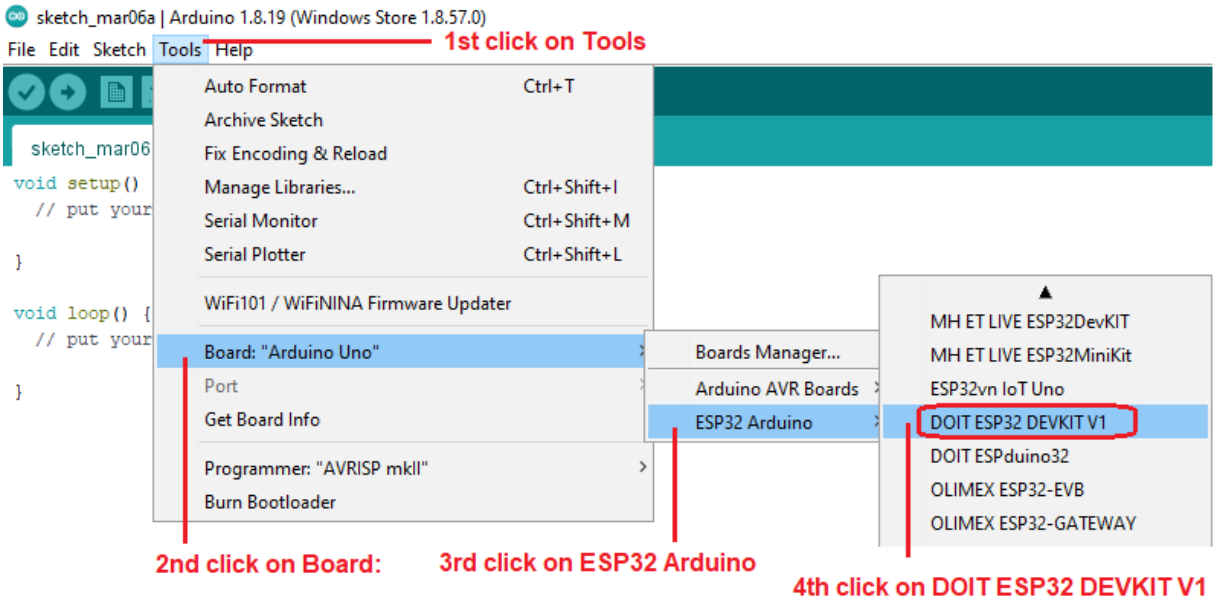
Go to **Tools -> Board: -> Boards manager**



Search for ESP32 in the searchbar and select the latest version and press the install button. After successfully installation, press the close button.

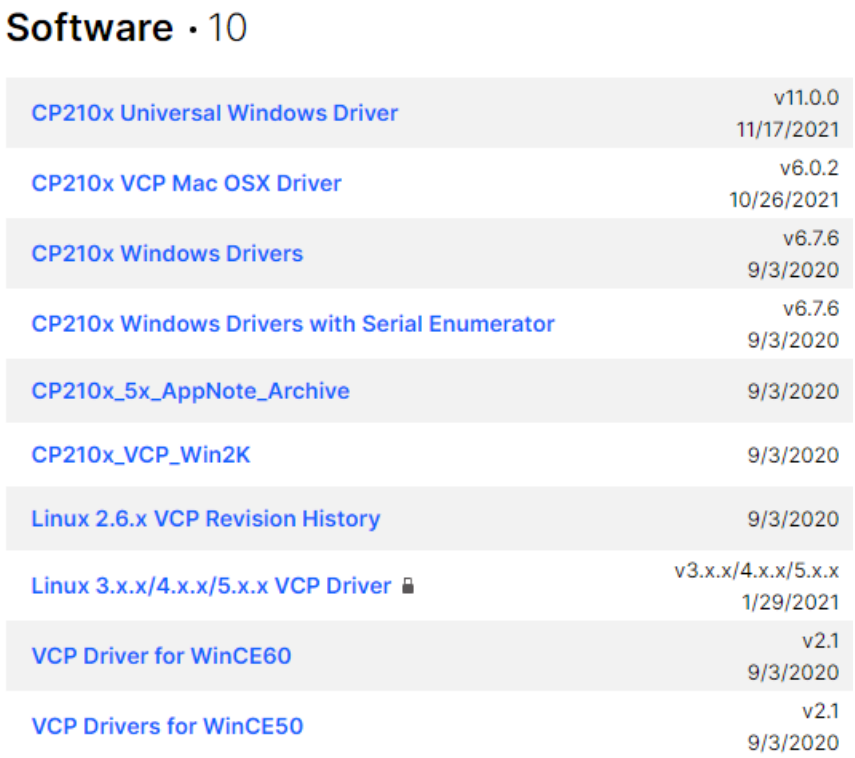


Now, go to same place and select the board. Go to **Tools -> Board: -> ESP32 Arduino -> DOIT ESP32 DEVKIT V1**.



Step 4: Add the serial driver and select the Com Port

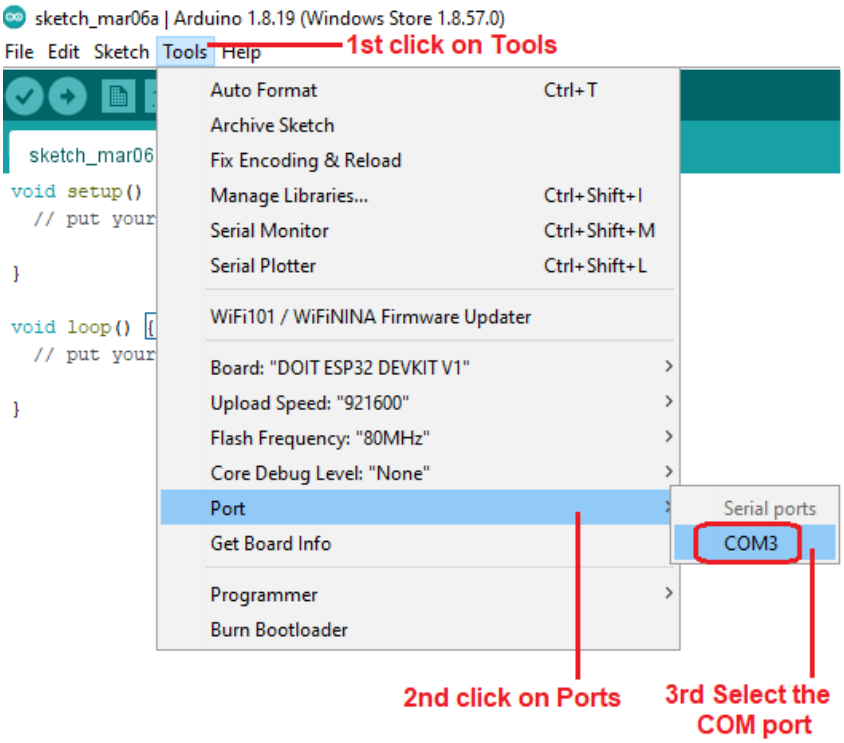
Now download the serial driver in your computer. Go to https://www.silabs.com/developers/usb-to-uart-bridge-vcp-drivers and select the driver according to you OS.



Software · 10

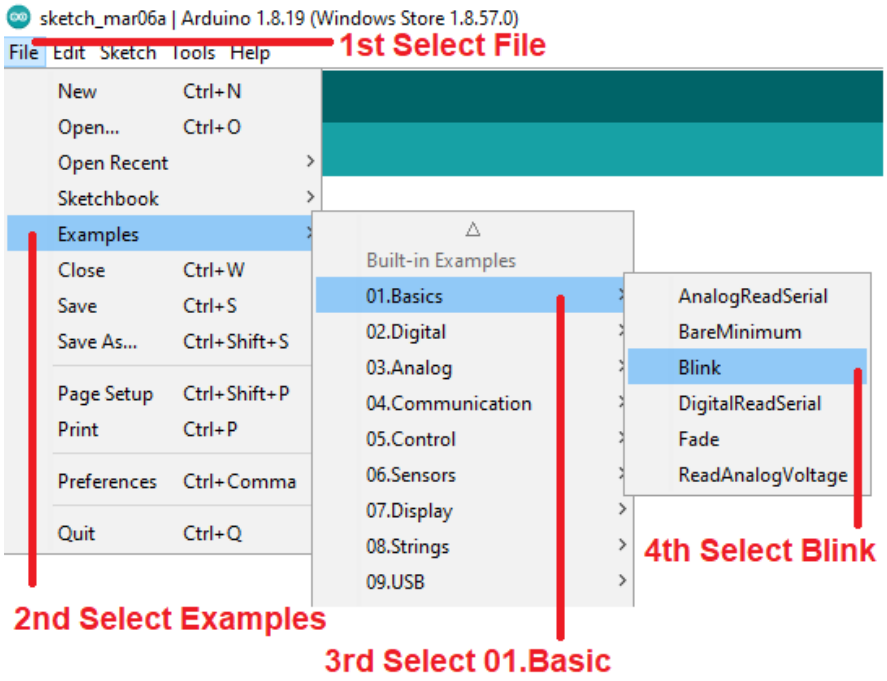
CP210x Universal Windows Driver	v11.0.0 11/17/2021
CP210x VCP Mac OSX Driver	v6.0.2 10/26/2021
CP210x Windows Drivers	v6.7.6 9/3/2020
CP210x Windows Drivers with Serial Enumerator	v6.7.6 9/3/2020
CP210x_5x_AppNote_Archive	9/3/2020
CP210x_VCP_Win2K	9/3/2020
Linux 2.6.x VCP Revision History	9/3/2020
Linux 3.x.x/4.x.x/5.x.x VCP Driver	v3.x.x/4.x.x/5.x.x 1/29/2021
VCP Driver for WinCE60	v2.1 9/3/2020
VCP Drivers for WinCE50	v2.1 9/3/2020

After Installing the drivers, you'll be able to see the COM port name in **Tools -> Port - > COMx**. Select this COM port. Arduino IDE downloads the code using the serial USB.

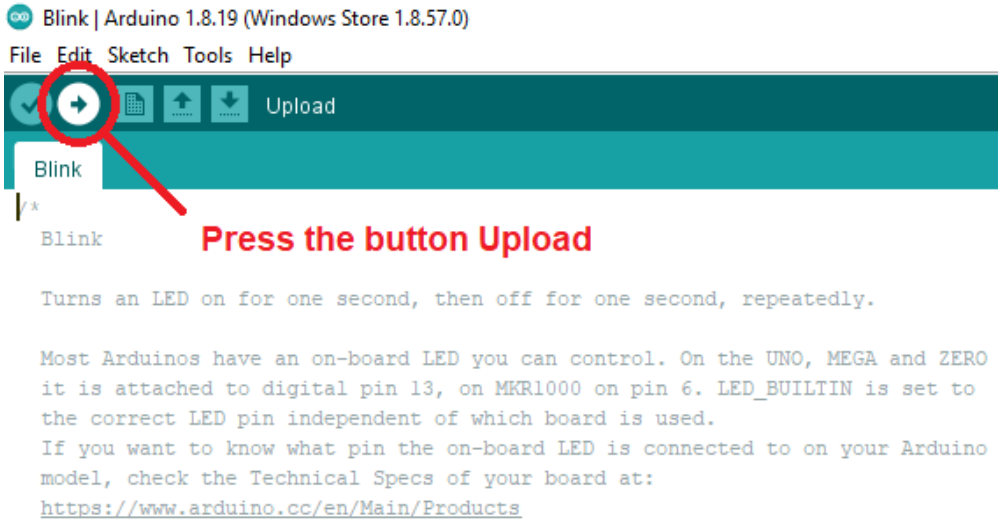


Check the Sample codes

Arduino IDE has lots of sample codes already available in the IDE. You have to select one and download it to your board. In this tutorial, we will start will blinking an LED.

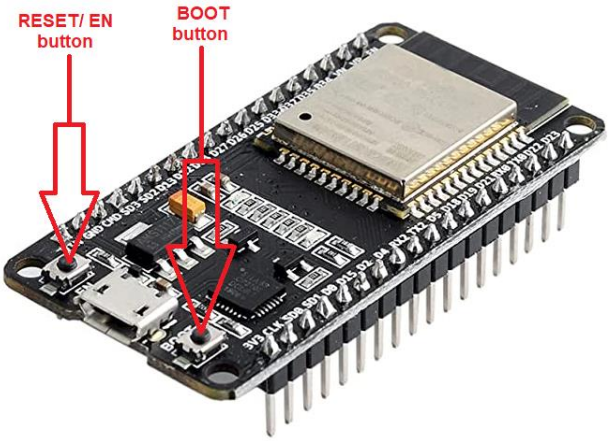


Now press the Upload button in the top right corner and wait for the Arduino IDE to compile the code and download it into the device. After the download Press the EN (RESET) button on the ESP32.



Downloading of code in old ESP32

Downloading in old ESP32 development kit is a bit tricky, you need to follow some sequence to download the code in the device.



Steps:
1. Wait for the “Connecting....____....____....____” message on the button screen.
2. Press BOOT button.
3. Press EN button.
4. Hold it for 2 sec.
5. Release the EN button.
6. Release the BOOT button.