Keyestudio ESP32 Core Board

(Black and Eco-friendly)

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Description:

This keyestudio ESP32 core board is a Mini development board based on the ESP-WROOM-32 module.

The board has brought out most I/O ports to pin headers of 2.54mm pitch. These provide an easy way of connecting peripherals according to your own needs.

When it comes to developing and debugging with the development board, the both side standard pin headers can make your operation more simple and handy.

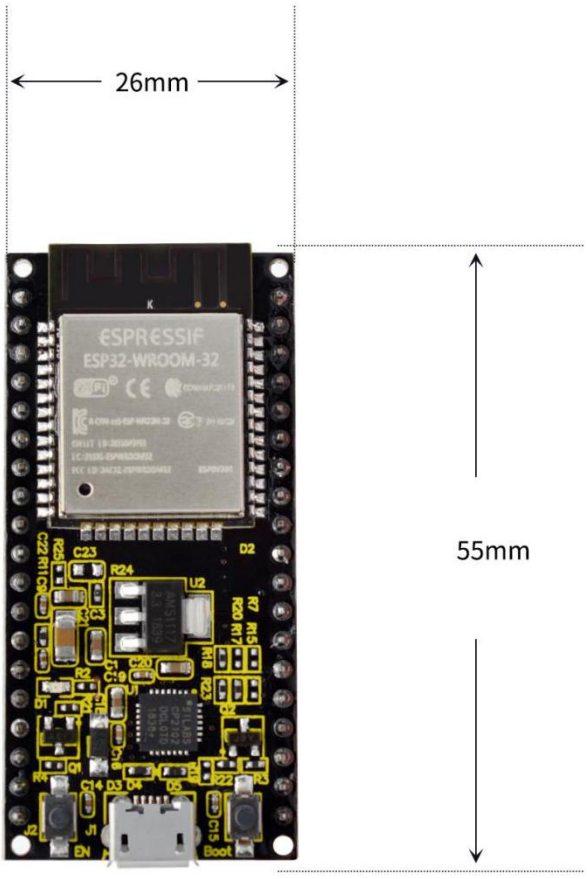
The ESP-WROOM-32 module is the industry's leading integrated WiFi + Bluetooth solution with less than 10 external components.

It integrates antenna switch, RF balun, power amplifiers, low noise amplifiers, filters and power management modules.

At the same time, it also integrates with TSMC's low-power 40nm technology, so that power performance and RF performance are safe and reliable, easy to expand to a variety of applications.

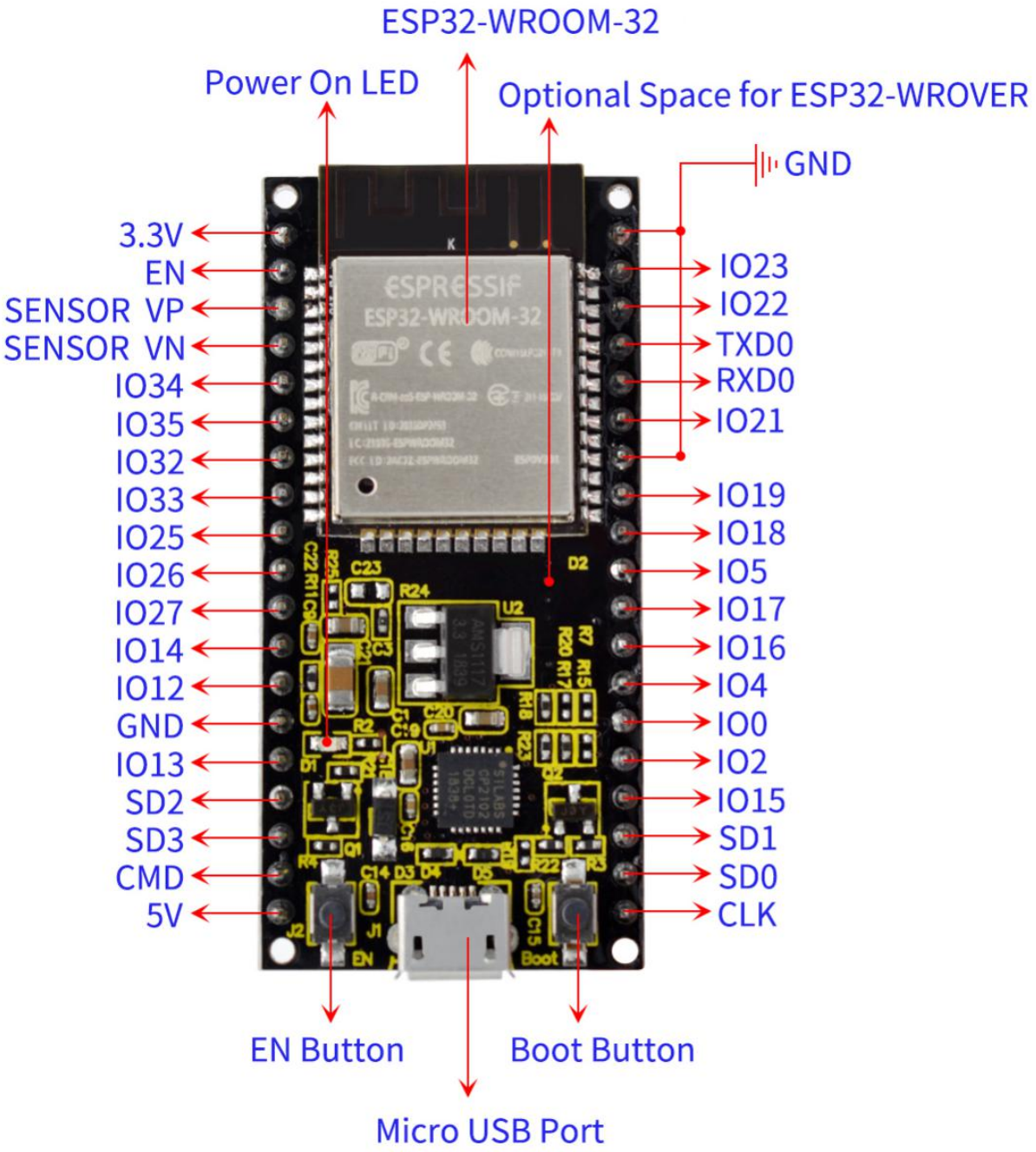
Technical Details:

- Microcontroller: ESP-WROOM-32 module
- USB to Serial Port Chip: CP2102-GMR
- Operating Voltage: DC 5V
- Operating Current: 80mA (average)
- Current Supply: 500mA (Minimum)
- Operating Temperature Range: -40℃ ~ +85℃
- WiFi mode: Station/SoftAP/SoftAP+Station/P2P
- WiFi protocol: 802.11 b/g/n/e/i (802.11n, speed up to 150 Mbps
- WiFi frequency range: 2.4 GHz ~ 2.5 GHz
- Bluetooth protocol: conform to Bluetooth v4.2 BR/EDR and BLE standards
- Dimensions: 55mm*26mm*13mm
- Weight: 9.3g



Element and Interfaces:

Here is an explanation of what every element and interface of the board has:



Specialized Functions of Some Pins:

PINS	EXPLANATIONS
IO23	VSPI MOSI/SPI MOSI
IO22	Wire SCL
TXD0	IO1/Serial TX
RXD0	IO3/Serial RX
IO21	Wire SDA
IO19	VSPI MISO/SPI MISO
IO18	VSPI SCK/SPI SCK
IO5	VSPI SS/SPI SS
IO4	ADC10/TOUCH0
IO0	ADC11/TOUCH1
IO2	ADC12/TOUCH2
IO15	HSPI SS/ADC13/TOUCH3/TDO
SD1	IO8/FLASH D1
SD0	IO7/FLASH D0
CLK	IO6/FLASH SCK
CMD	IO11/FLASH CMD
SD3	IO10/FLASH D3
SD2	IO9/FLASH D2
IO13	HSPI MOSI/ADC14/TOUCH4/TCK

IO12	HSPI MISO/ADC15/TOUCH5/TDI
IO14	HSPI SCK/ADC16/TOUCH6/TMS
IO27	ADC17/TOUCH7
IO26	ADC19/DAC2
IO25	ADC18/DAC1
IO33	ADC5/TOUCH8
IO32	ADC4/TOUCH9
IO35	ADC7
IO34	ADC6
SENSOR VN	IO39/ADC3
SENSOR VP	IO36/ADC0
EN	RESET

Detailed Using Method as follows:

Step1| Install the Arduino IDE

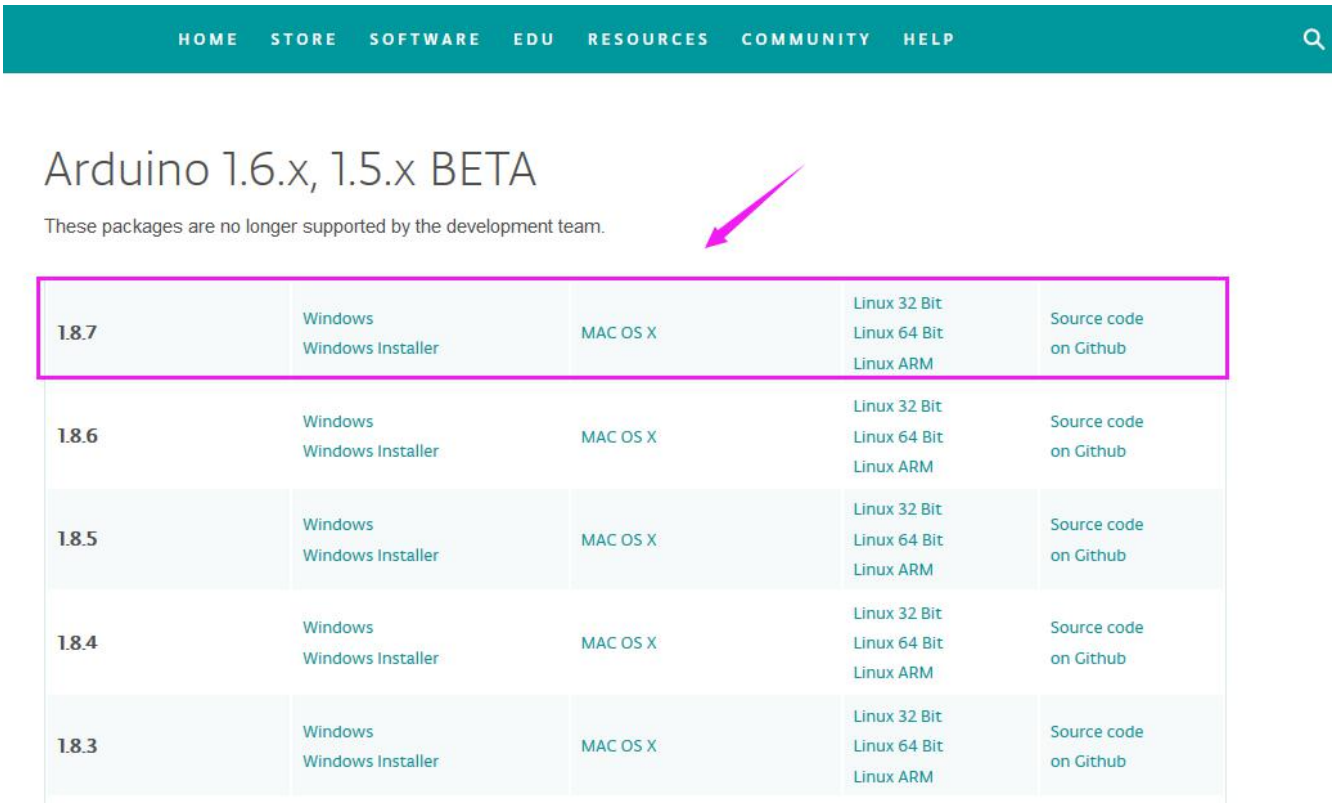
When programming the control board, first you should install the Arduino software and driver.

You can download the different versions for different systems from the link below:

https://www.arduino.cc/en/Main/OldSoftwareReleases#1.5.x

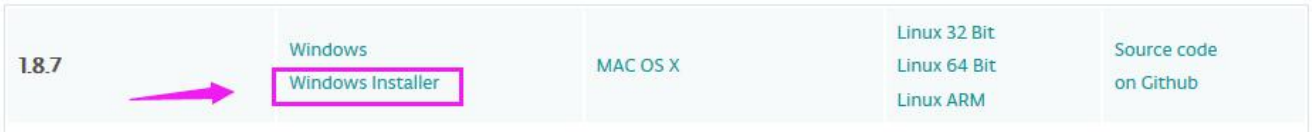
This control board is compatible with the Arduino 1.8.7 or latest version.

So next we will download the Arduino 1.8.7 software to test the keyestudio ESP32 core board.

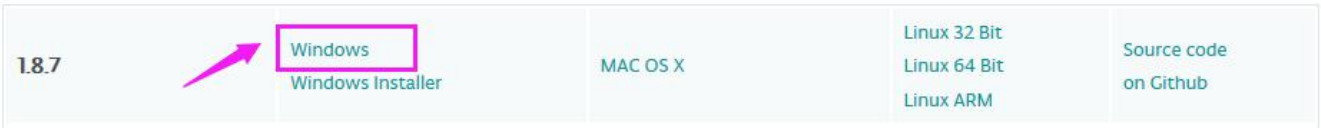


In this Windows system page, there are two options. One is Windows version, the other is Windows Installer.

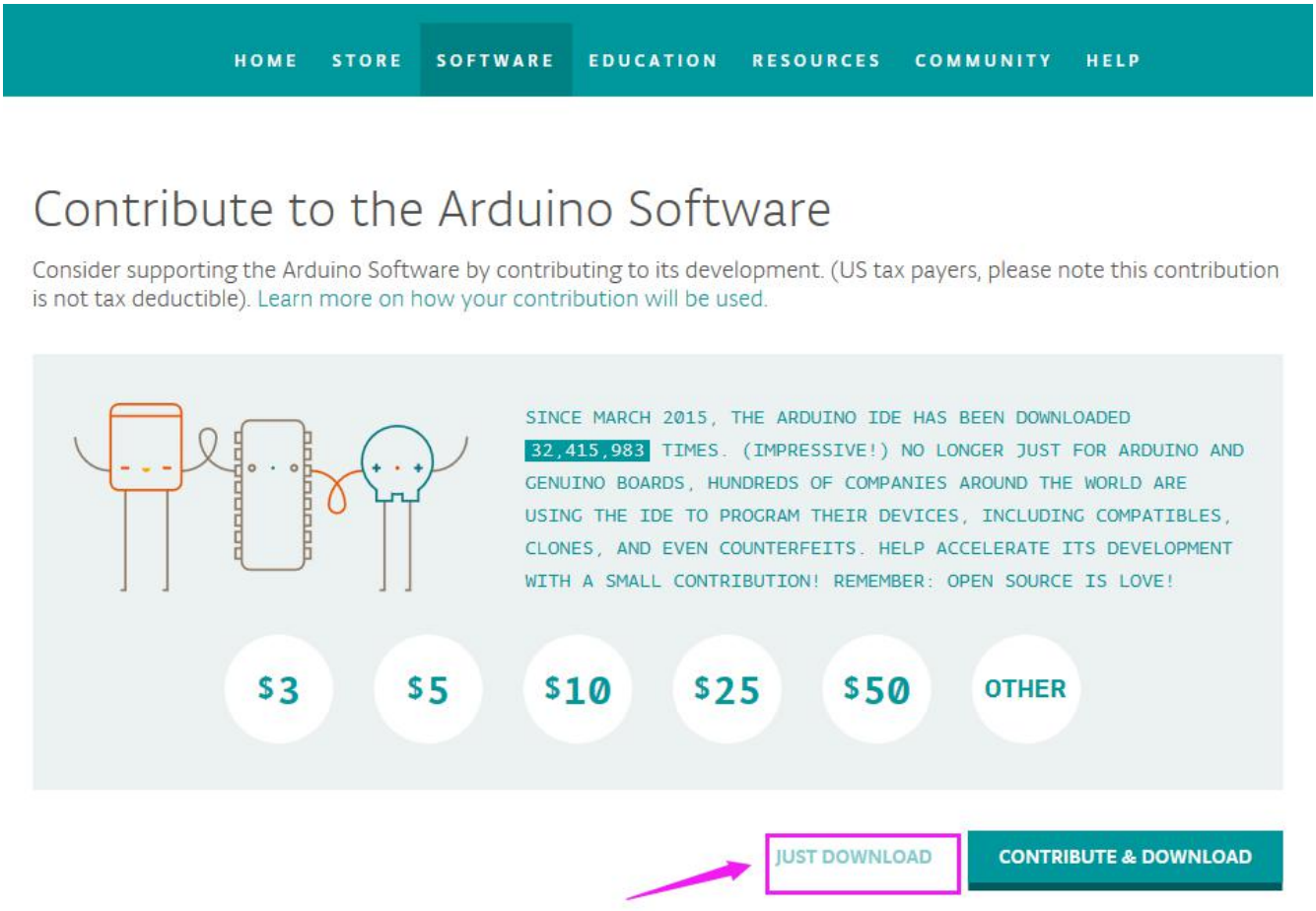
For Windows Installer, you can download the installation file, this way you need to install the arduino IDE.



For simple Windows version, you can download the software directly, do not need to install, just directly use the software after unzip the package.

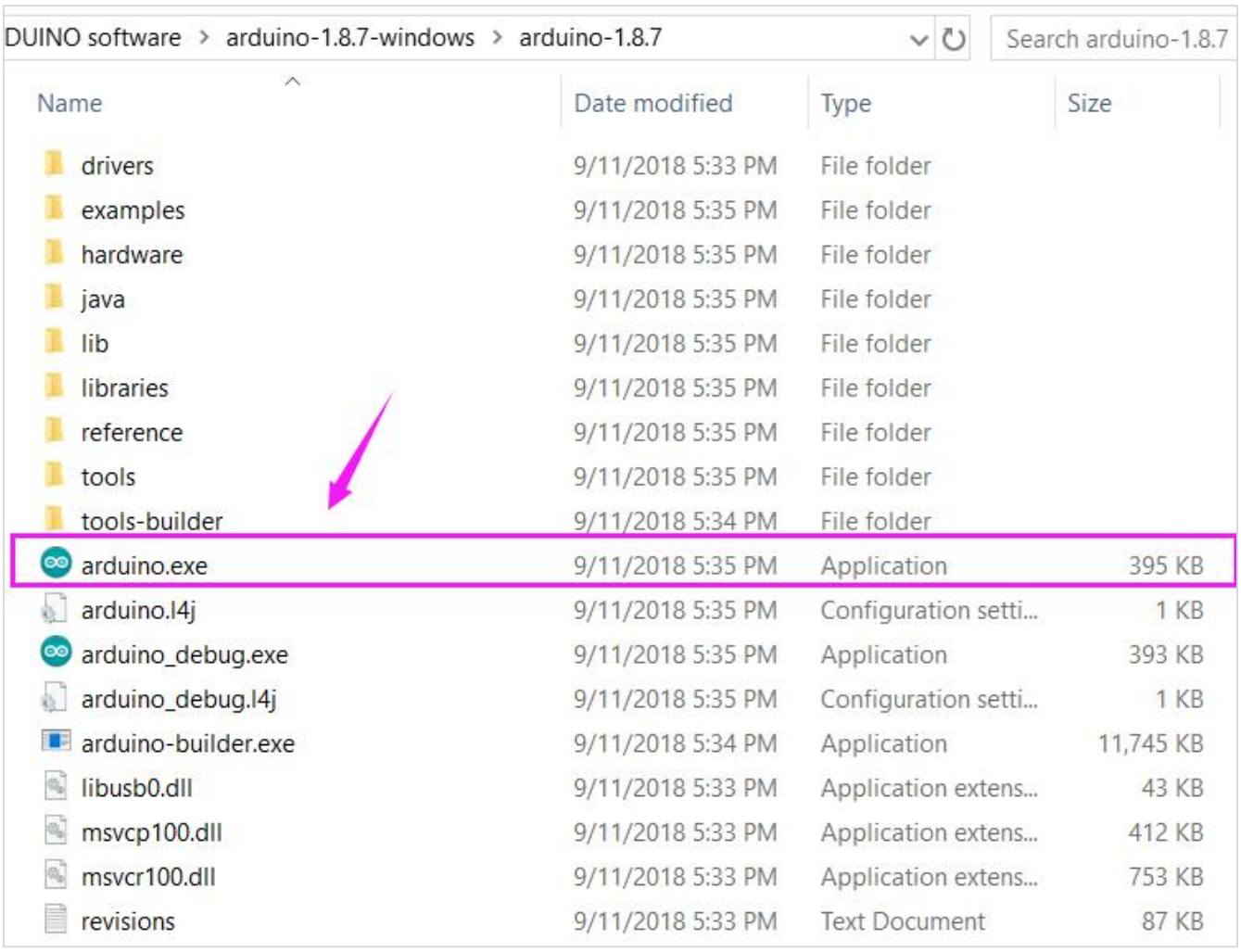


Next, we click the **Windows**, pop up the interface as below.

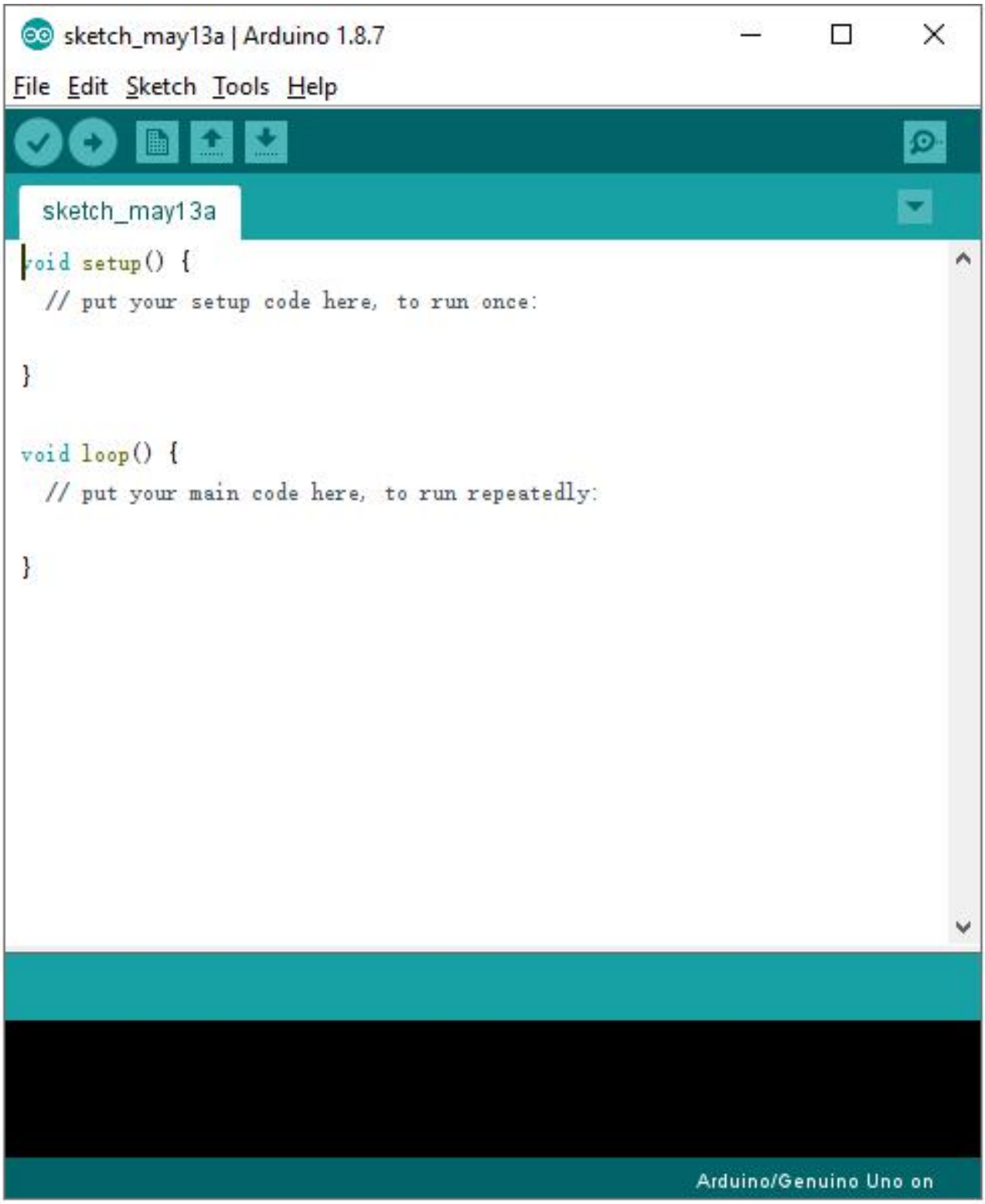


Click **JUST DOWNLOAD**.

Downloaded well the **arduino-1.8.7-windows.zip** package to your computer, you can direct to unzip the package. Open the Arduino-1.8.7 folder, you should get it as follows.



Click the icon of ARDUINO software to open. This is your Arduino.

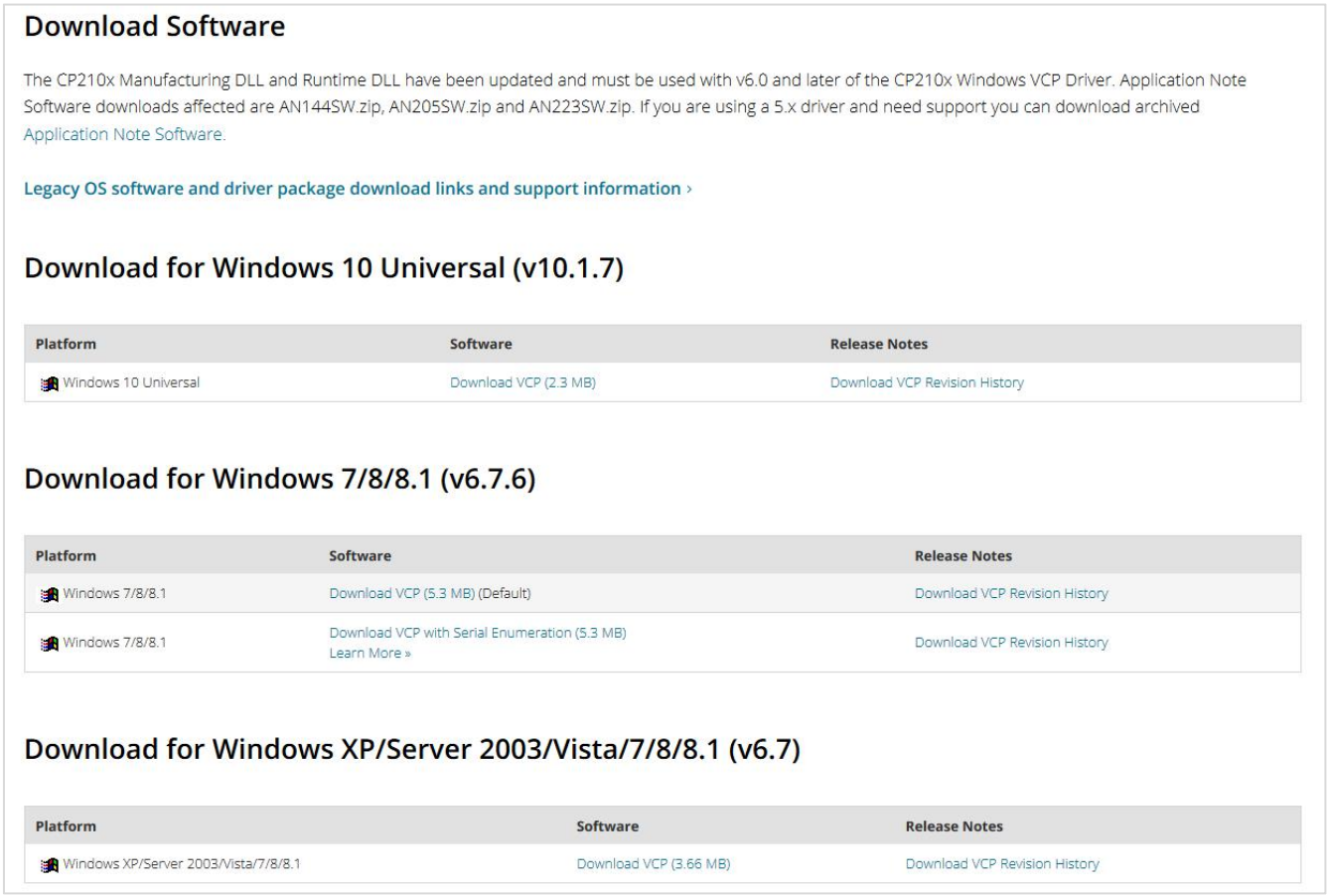


Step2| Installing the Driver

The USB to serial port chip of this control board is CP2102-GMR. So you need to install the driver for the chip.

You can click the driver tool download link:

https://www.silabs.com/products/development-tools/software/usb-to-uart-bridge-vcp-drivers



Download Software

The CP210x Manufacturing DLL and Runtime DLL have been updated and must be used with v6.0 and later of the CP210x Windows VCP Driver. Application Note Software downloads affected are AN144SW.zip, AN205SW.zip and AN223SW.zip. If you are using a 5.x driver and need support you can download archived Application Note Software.

Legacy OS software and driver package download links and support information ›

Download for Windows 10 Universal (v10.1.7)

Platform	Software	Release Notes
Windows 10 Universal	Download VCP (2.3 MB)	Download VCP Revision History

Download for Windows 7/8/8.1 (v6.7.6)

Platform	Software	Release Notes
Windows 7/8/8.1	Download VCP (5.3 MB) (Default)	Download VCP Revision History
Windows 7/8/8.1	Download VCP with Serial Enumeration (5.3 MB) Learn More »	Download VCP Revision History

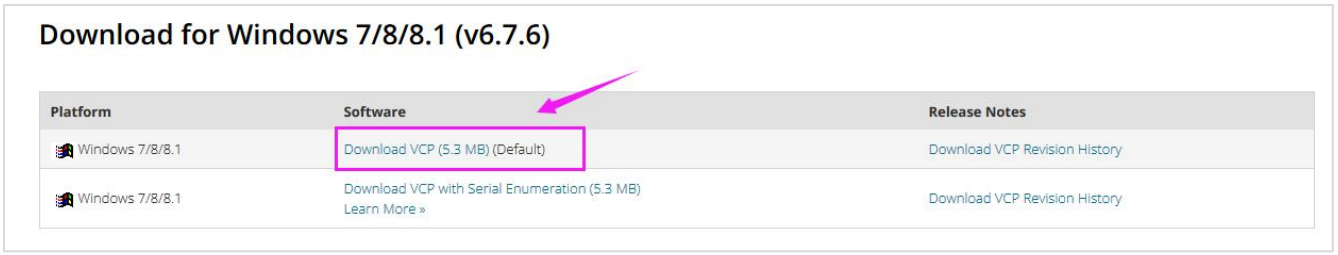
Download for Windows XP/Server 2003/Vista/7/8/8.1 (v6.7)

Platform	Software	Release Notes
Windows XP/Server 2003/Vista/7/8/8.1	Download VCP (3.66 MB)	Download VCP Revision History

It includes different drivers for different computer's systems. Download and install the driver according to your computer's system.

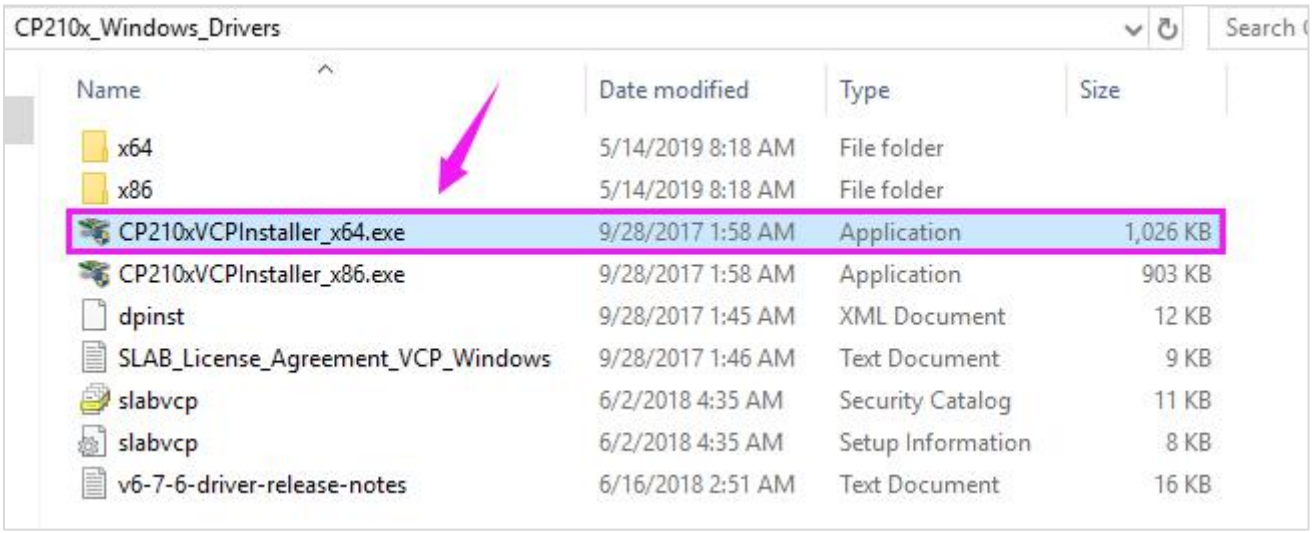
For example, we download the driver for Windows 7. Get the compression

package of CP210x_Windows_Drivers



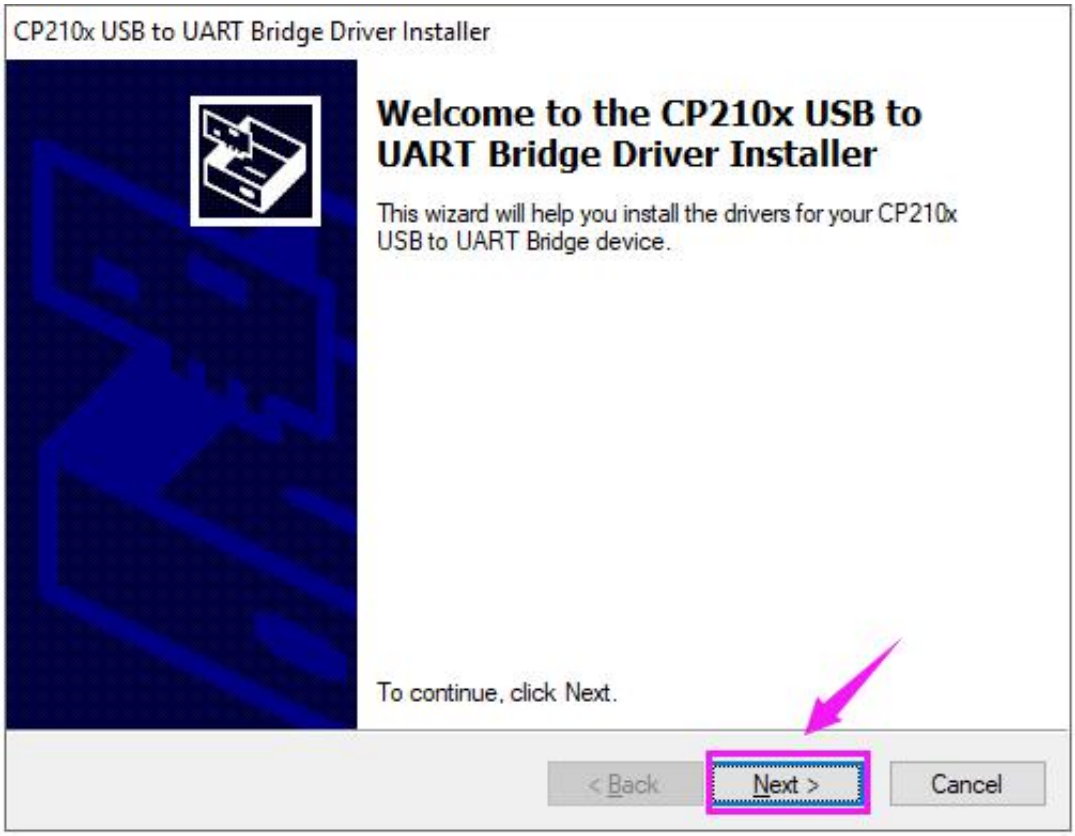
CP210x_Windows_Drivers

Then extract the compression package; you should see the application to install.

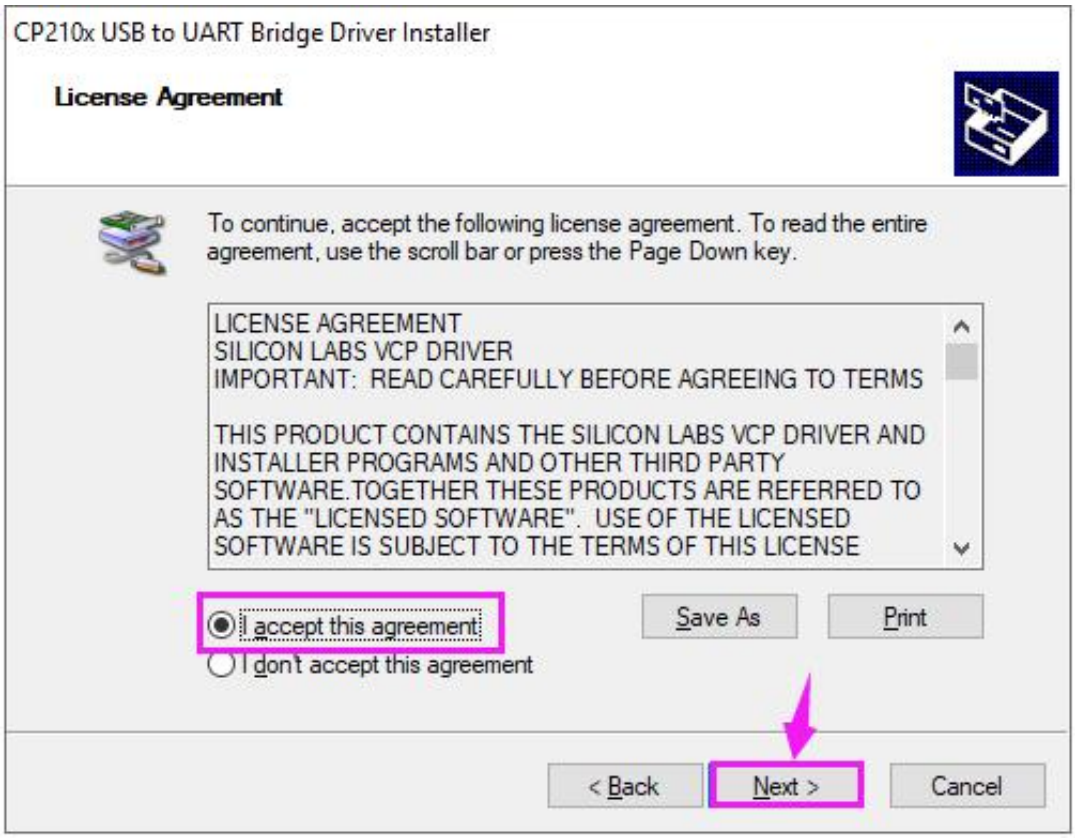


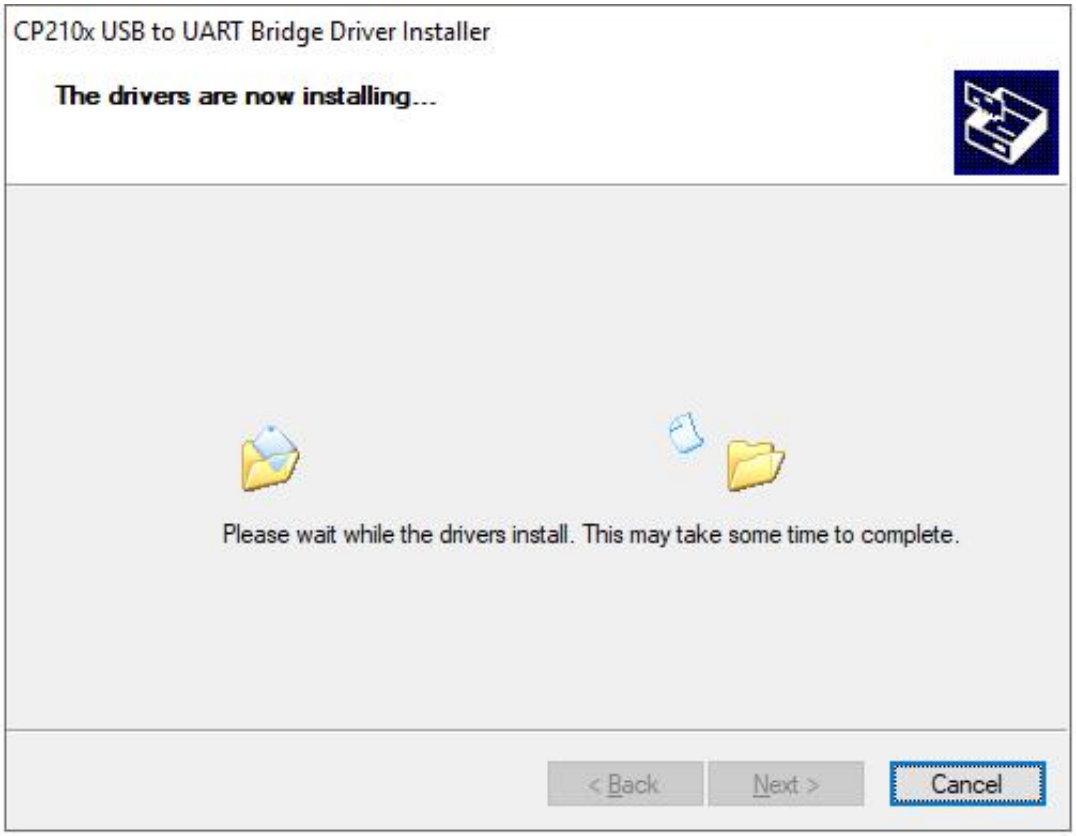
The driver software installation is very simple. Just select the driver application as you like.

Click to **.exe** package to install the driver. Click "Next".

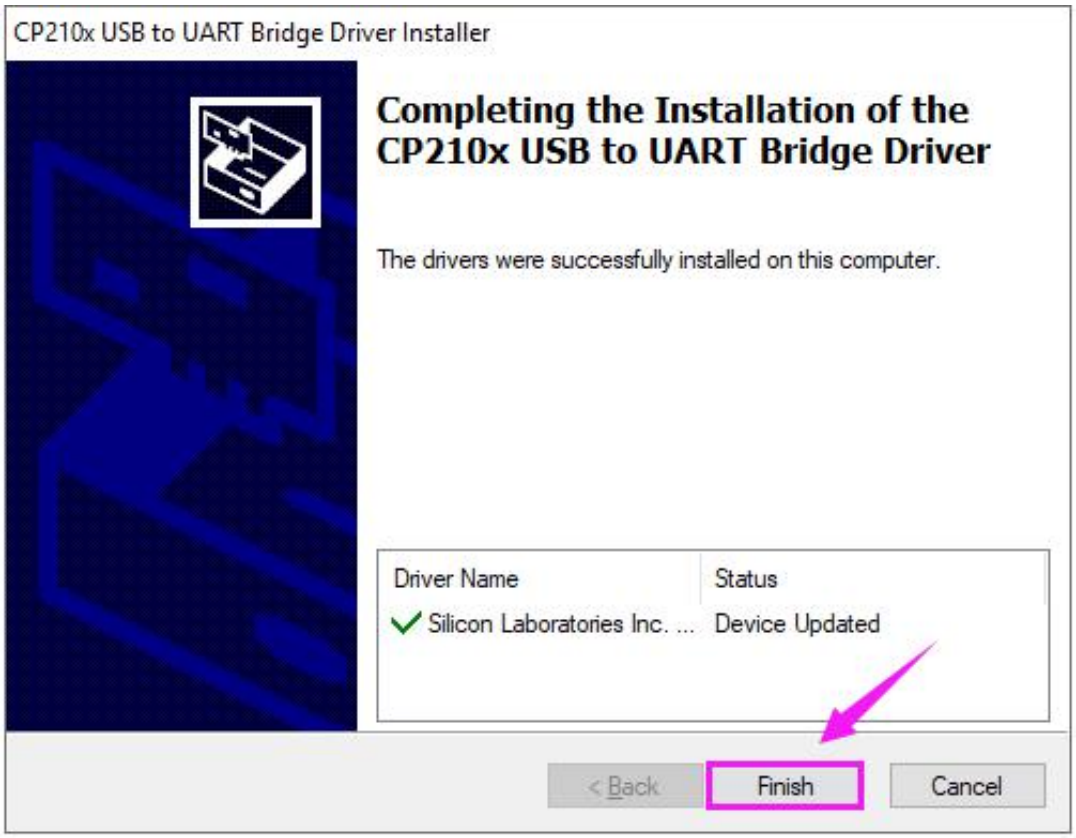


Click to select "I accept this agreement" and click "Next".



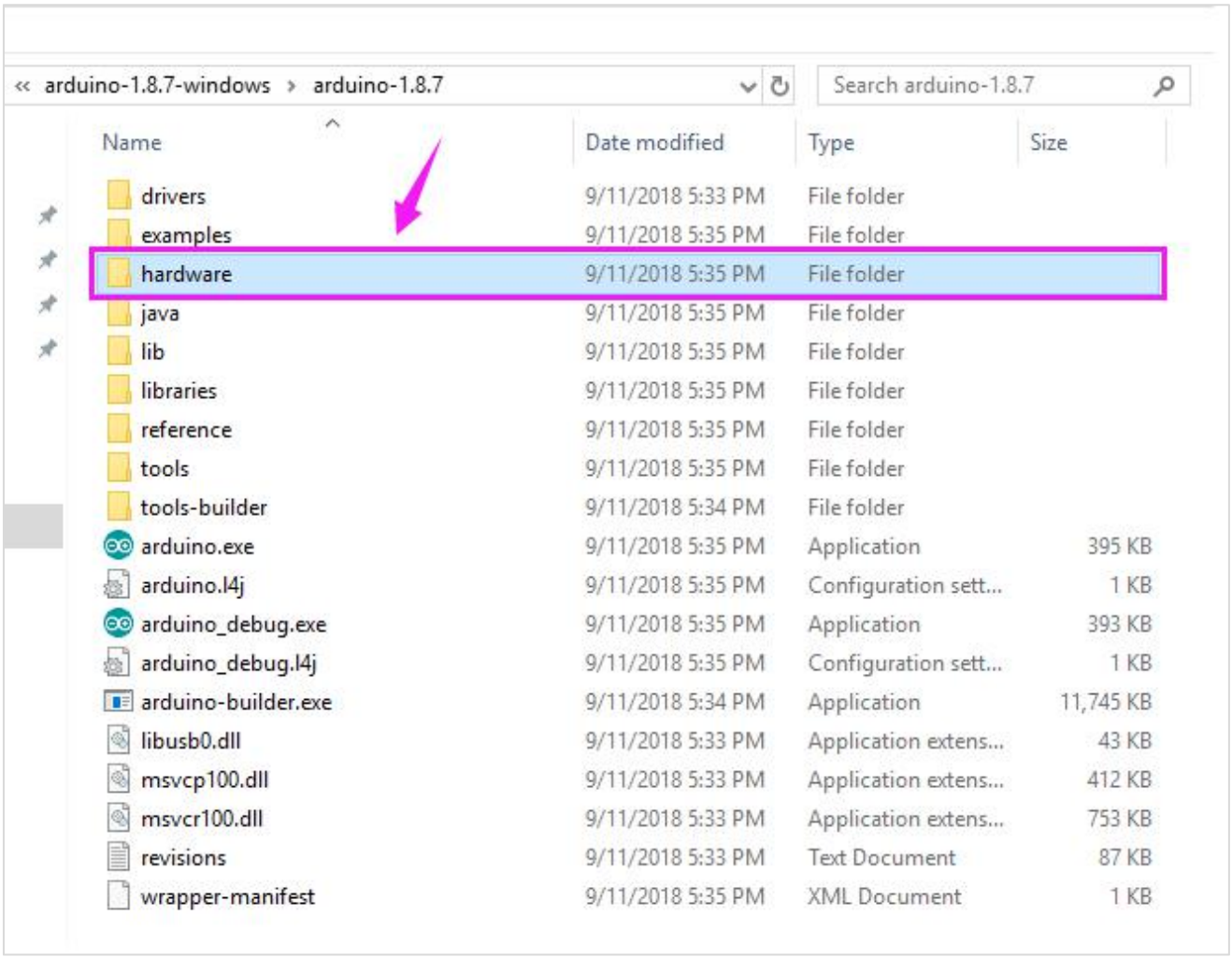


Wait for the installation complete. Finally click "Finish" to close the window.

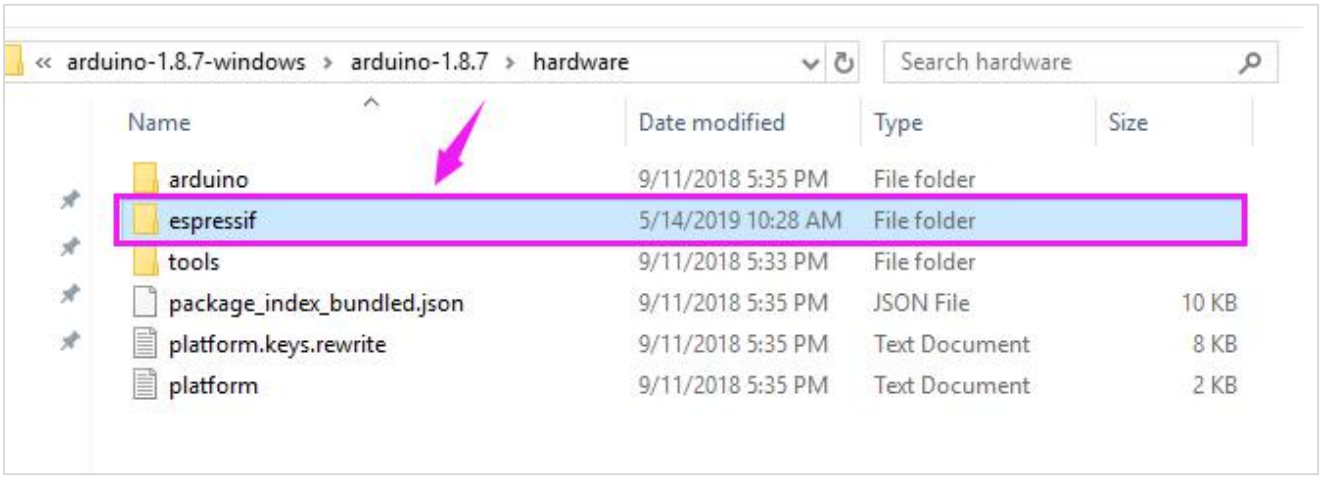


Step3| Building ESP32 Environment

At first, open the Arduino-1.8.7 folder, you will see the hardware folder;

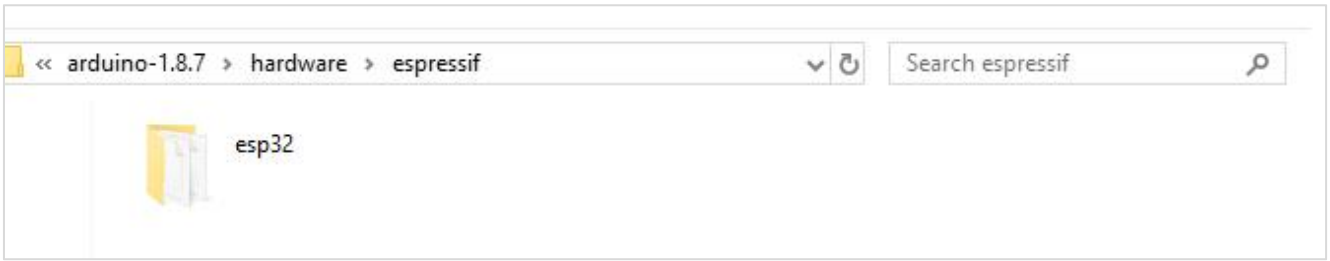


Then open the hardware folder and add a new folder, remember to name it **espressif** shown below.

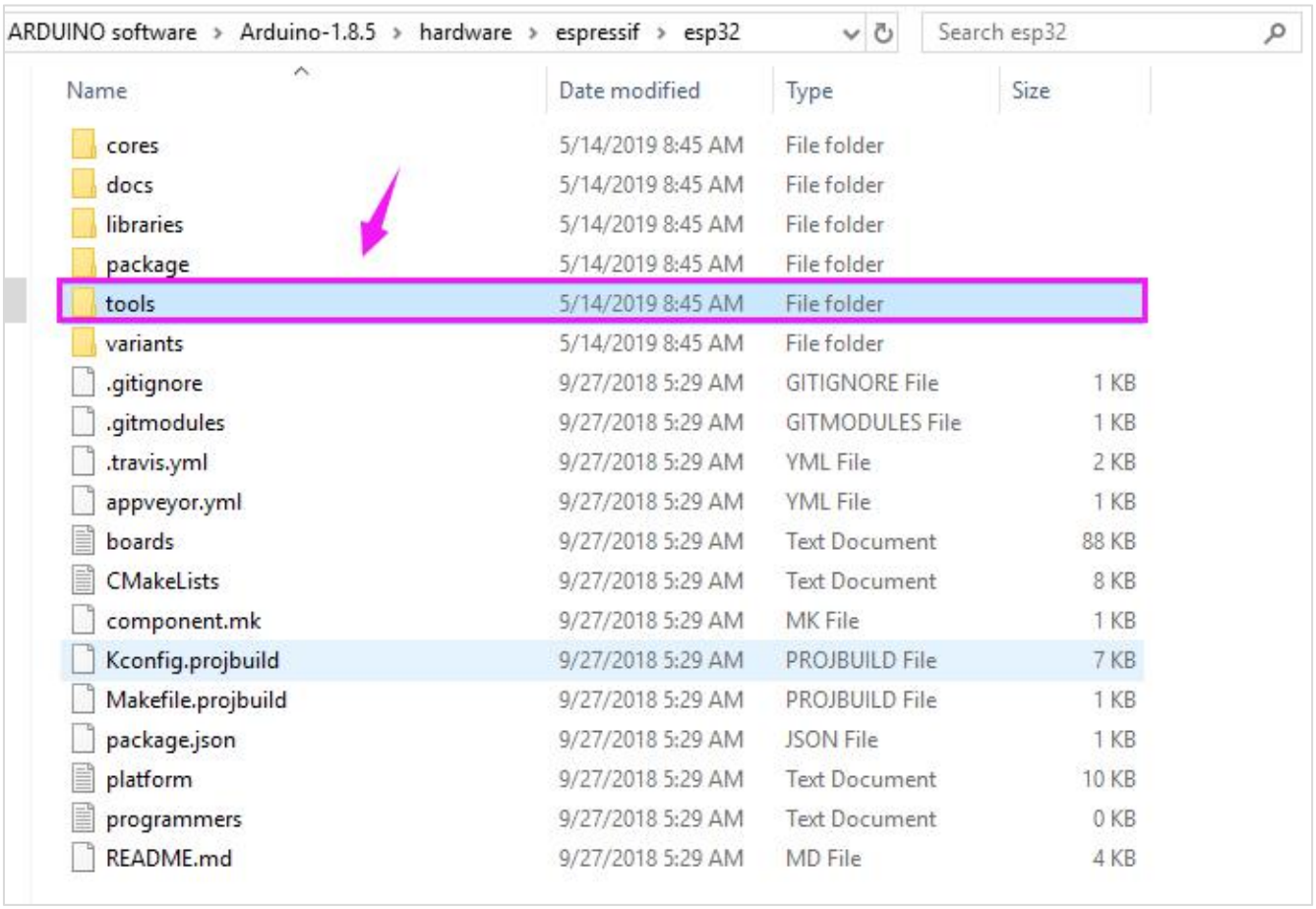


After that, unzip the esp32 compression package we provided, and copy to the **espressif** folder.

So inside the **espressif** folder should see the esp32 folder as below. Note that the folder should not name a type.

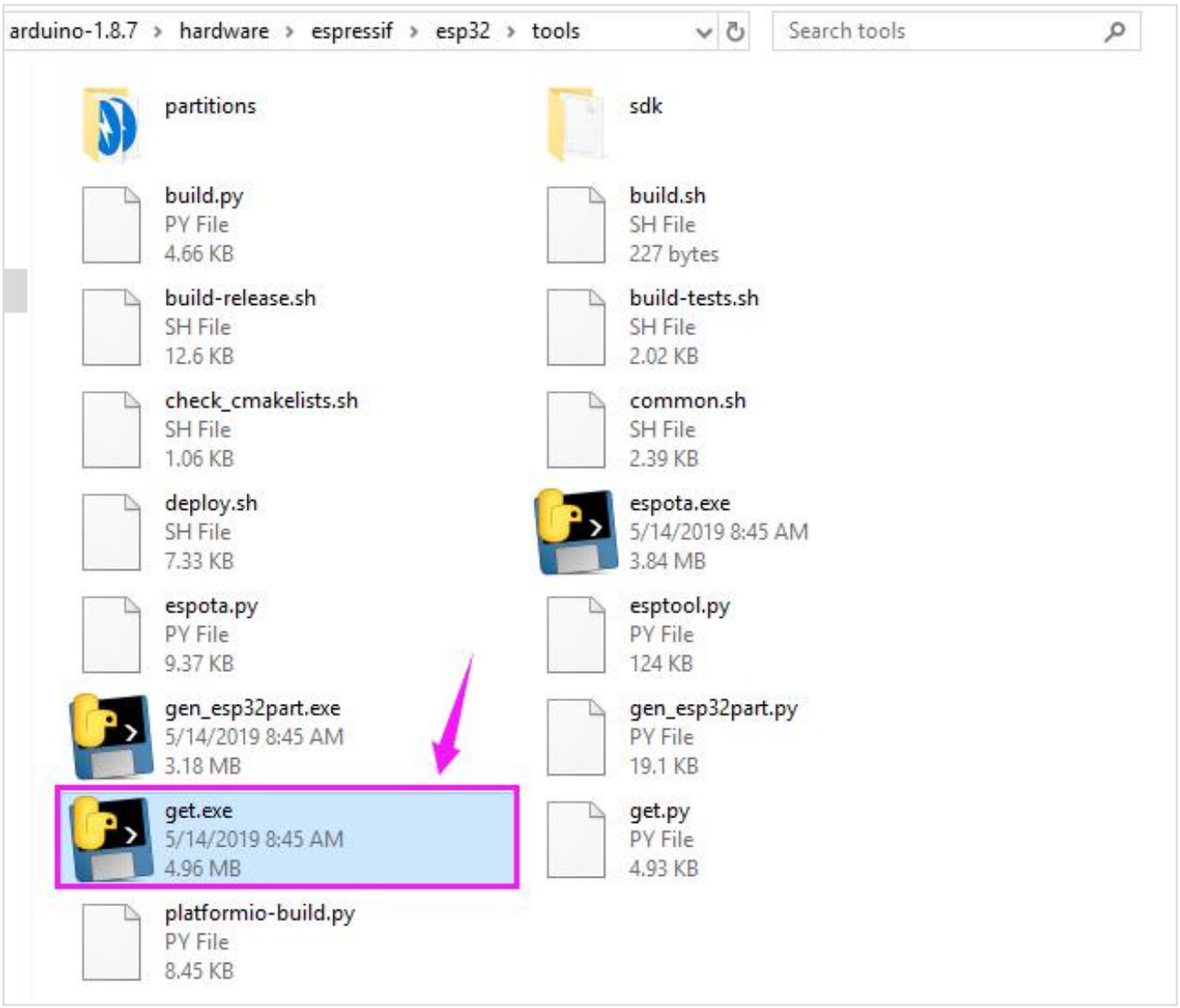


Now, click to enter the esp32 folder and you can see the **tools** folder below.

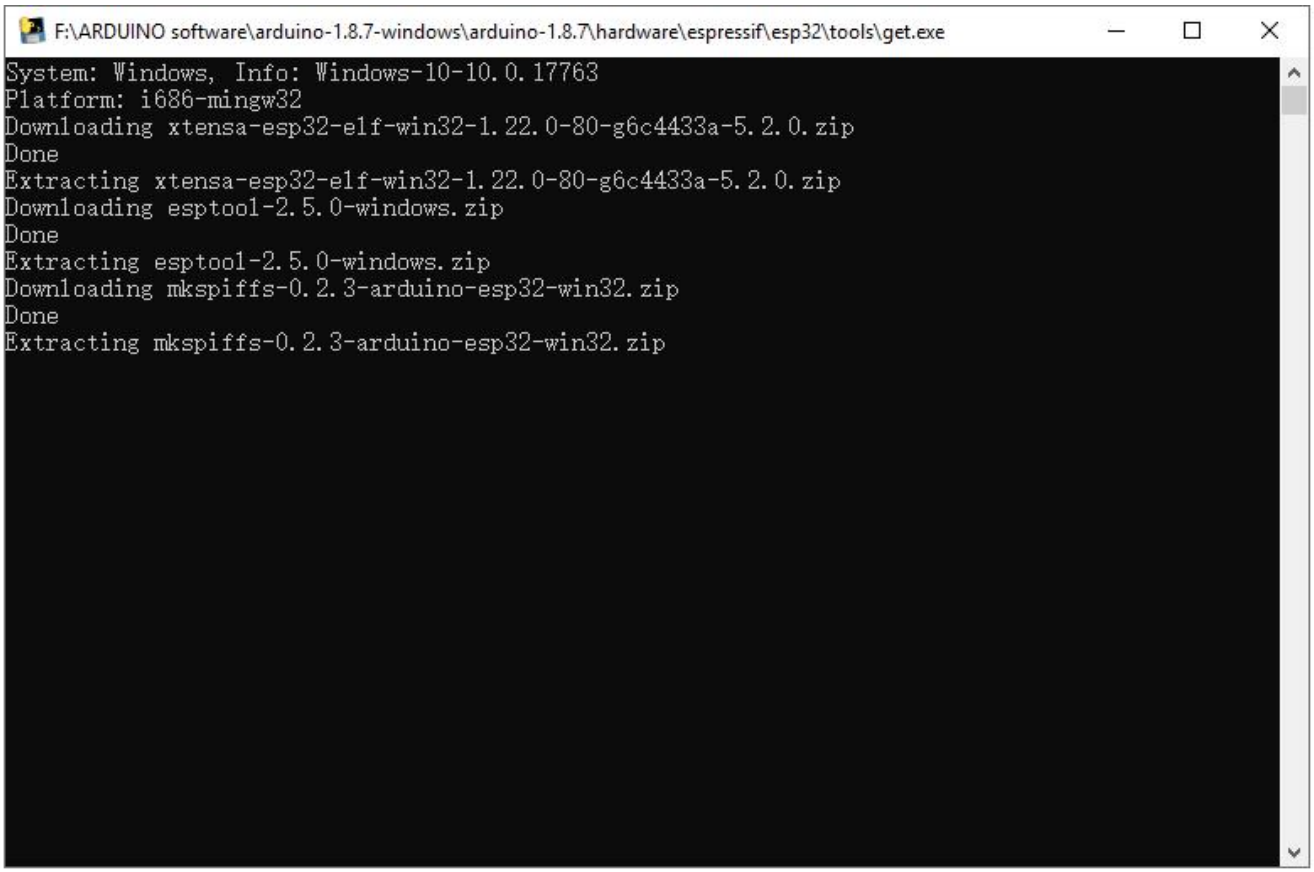


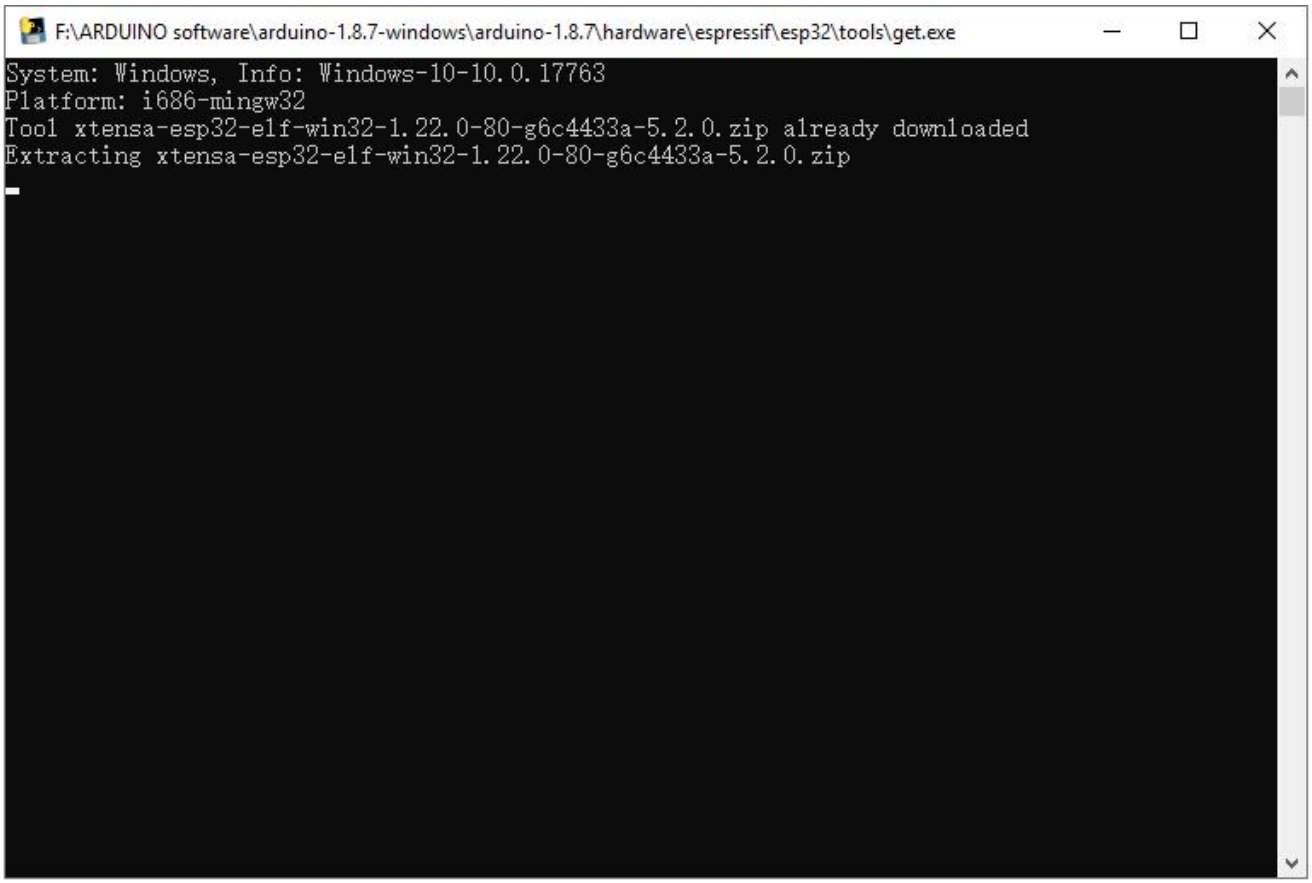
Enter the **tools** folder and click to run the **get.exe** application as an administrator.

(But the precondition is that you have already installed the Python)



When run the **get.exe** application, ensure that your network is unblocked and wait for the program download. Done downloading, the following window will automatically close.

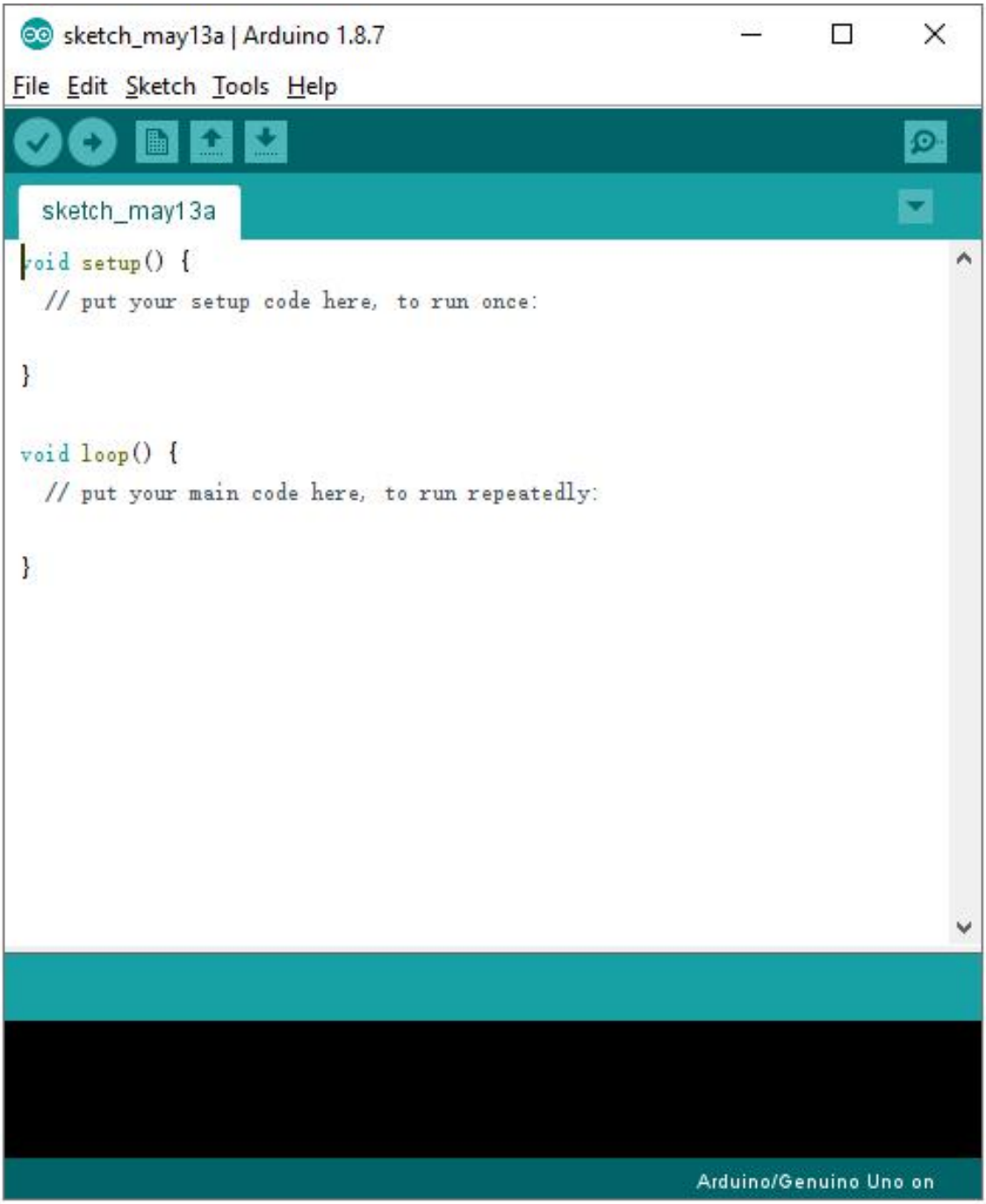

F:\ARDUINO software\arduino-1.8.7-windows\arduino-1.8.7\hardware\espressif\esp32\tools\get.exe
System: Windows, Info: Windows-10-10.0.17763
Platform: i686-mingw32
Downloading xtensa-esp32-elf-win32-1.22.0-80-g6c4433a-5.2.0.zip
Done
Extracting xtensa-esp32-elf-win32-1.22.0-80-g6c4433a-5.2.0.zip
Downloading esptool-2.5.0-windows.zip
Done
Extracting esptool-2.5.0-windows.zip
Downloading mkspiffs-0.2.3-arduino-esp32-win32.zip
Done
Extracting mkspiffs-0.2.3-arduino-esp32-win32.zip


F:\ARDUINO software\arduino-1.8.7-windows\arduino-1.8.7\hardware\espressif\esp32\tools\get.exe
System: Windows, Info: Windows-10-10.0.17763
Platform: i686-mingw32
Tool xtensa-esp32-elf-win32-1.22.0-80-g6c4433a-5.2.0.zip already downloaded
Extracting xtensa-esp32-elf-win32-1.22.0-80-g6c4433a-5.2.0.zip

Step4| Arduino IDE Setting and Toolbar

Double-click the icon of Arduino software downloaded to open the IDE.

This is your Arduino 1.8.7 interface.

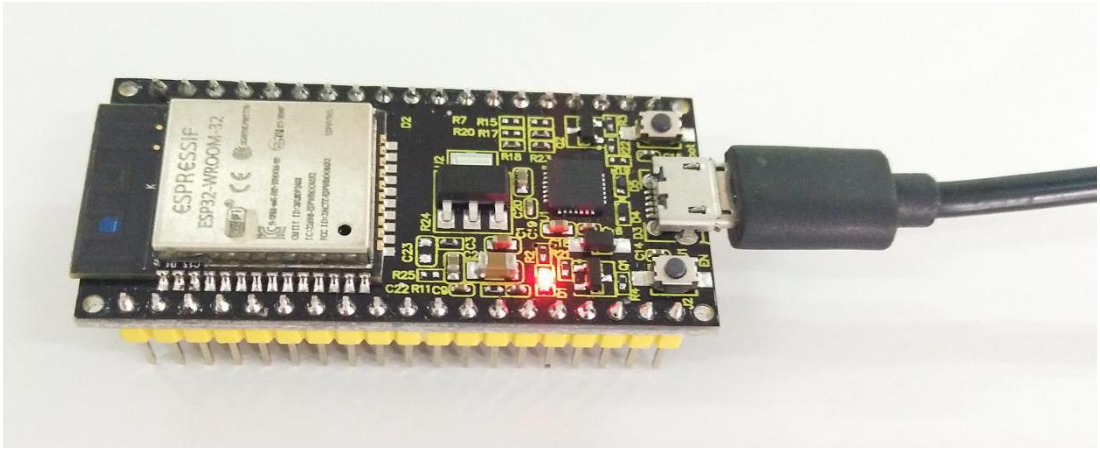


(**Note:** if the Arduino software loads in the wrong language, you can change it in the preferences dialog. See the environment page for details.)

The functions of each button on the Toolbar are listed below:

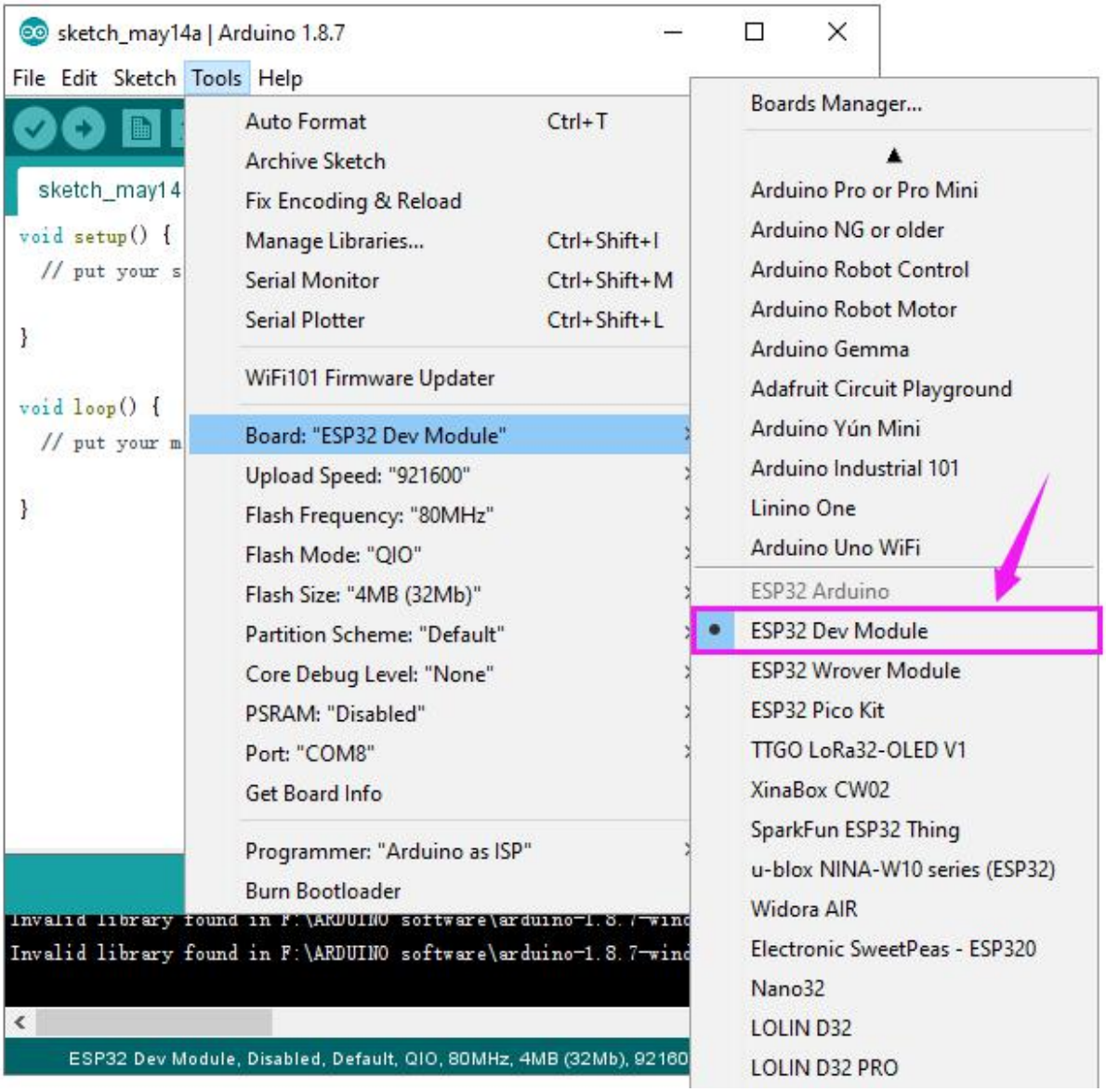
Verify/Compile	Check the code for errors
Upload	Upload the current Sketch to the Arduino
New	Create a new blank Sketch
Open	Show a list of Sketches
Save	Save the current Sketch
Serial Monitor	Display the serial data being sent from the Arduino

Attach your ESP32 core board to your computer with the USB cable.

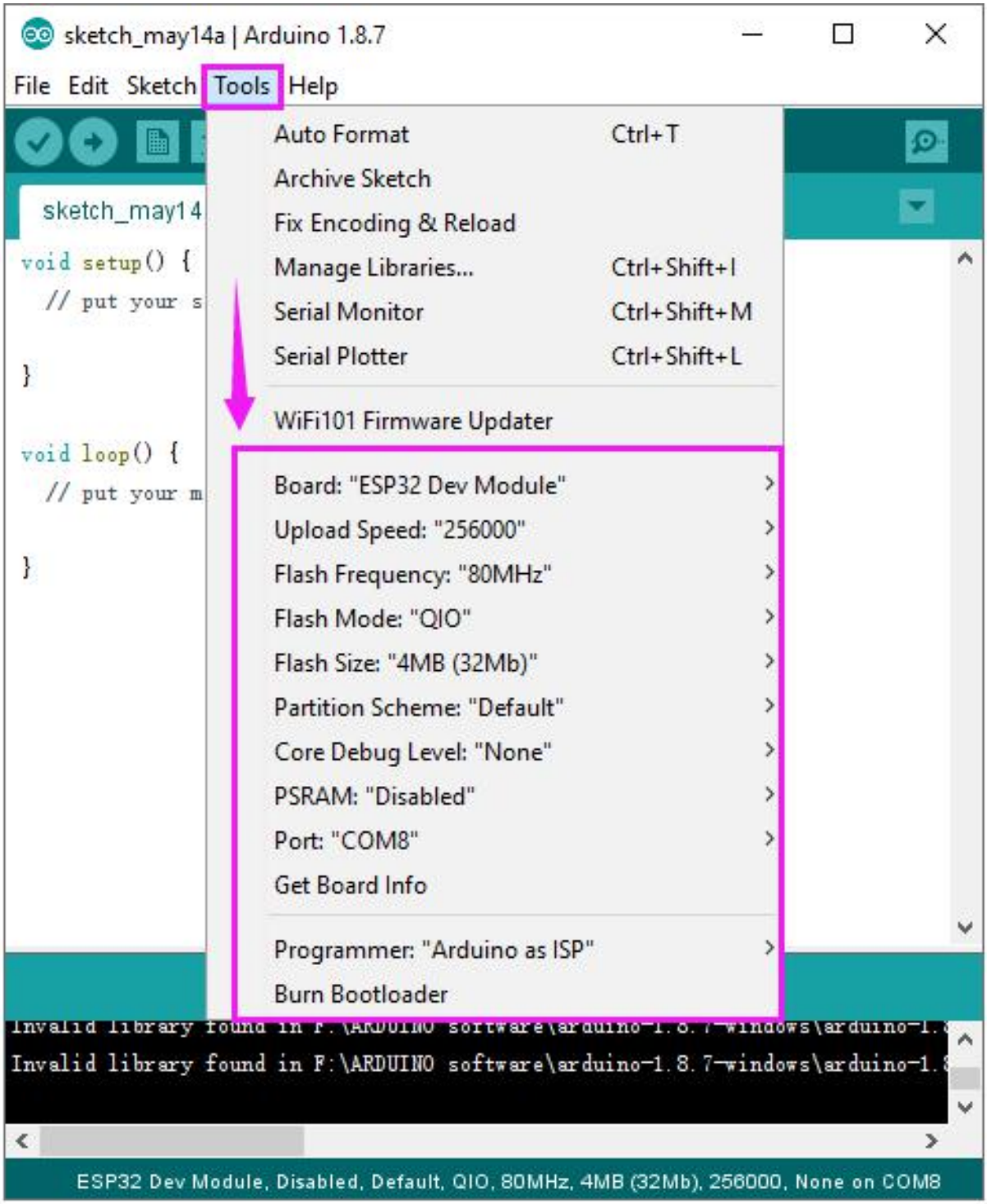


Check that the "Board Type"and "Serial Port" are set correctly.

Click to open the "**Tools"**, for "**Board"**, scroll to select the ESP32 Dev Module.

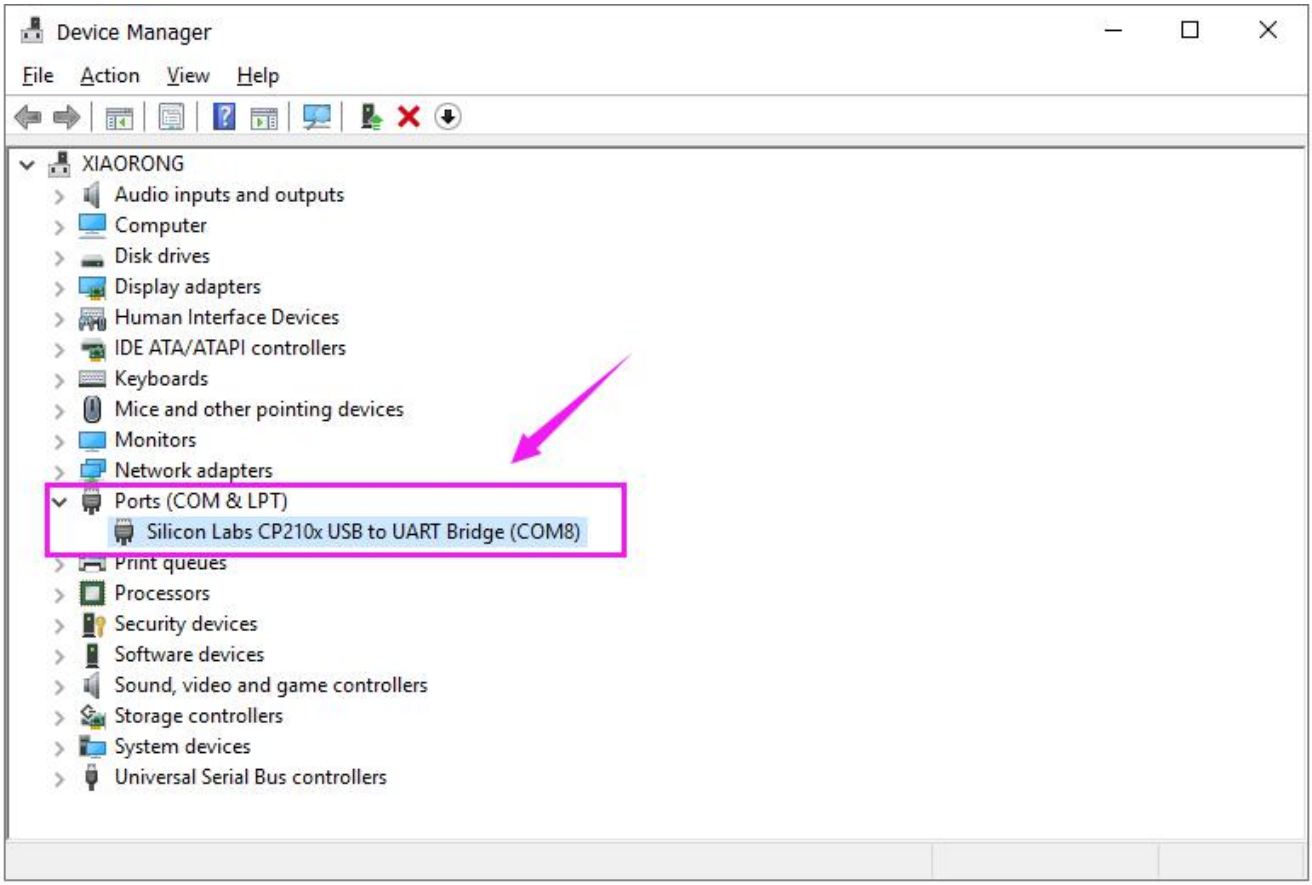


Select well the correct board and then should set the detailed information as shown below.

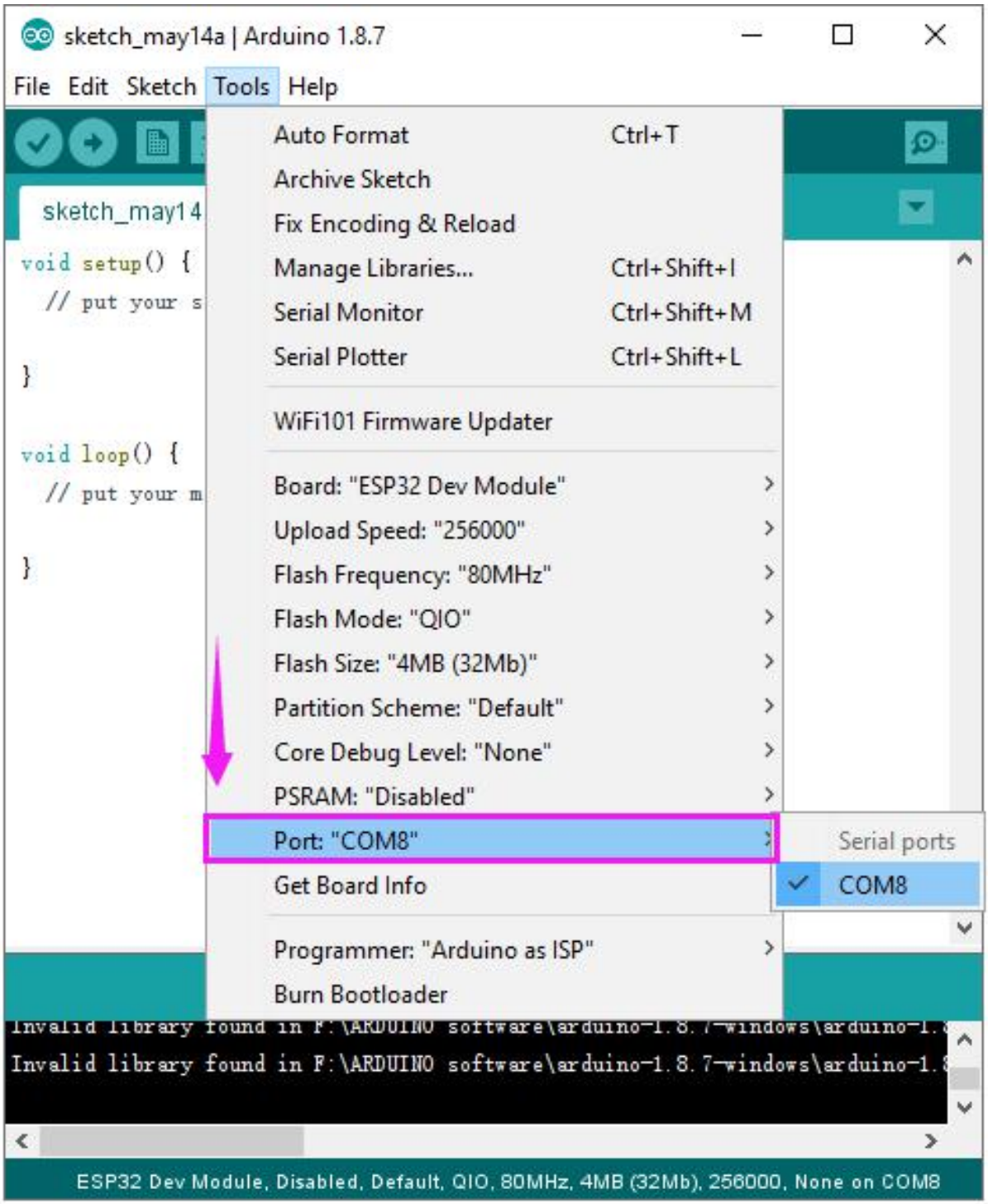


Pay close attention to select the proper **COM** port. (Arduino driver installed well, you are supposed to see the corresponding port.)

Check out the COM port in the Device Manager of your computer's control panel.



Here we can know the COM port is COM 8. Then select the Port COM 8 in the Arduino Tools.


sketch_may14a | Arduino 1.8.7
File Edit Sketch Tools Help
sketch_may14
void setup() {
// put your s
}
void loop() {
// put your m
}
Auto Format Ctrl+T
Archive Sketch
Fix Encoding & Reload
Manage Libraries... Ctrl+Shift+I
Serial Monitor Ctrl+Shift+M
Serial Plotter Ctrl+Shift+L
WiFi101 Firmware Updater
Board: "ESP32 Dev Module"
Upload Speed: "256000"
Flash Frequency: "80MHz"
Flash Mode: "QIO"
Flash Size: "4MB (32Mb)"
Partition Scheme: "Default"
Core Debug Level: "None"
PSRAM: "Disabled"
Port: "COM8"
Get Board Info
Programmer: "Arduino as ISP"
Burn Bootloader
Serial ports
COM8
Invalid library found in F:\ARDUINO software\arduino-1.8.7-windows\arduino-1.8
Invalid library found in F:\ARDUINO software\arduino-1.8.7-windows\arduino-1.8
ESP32 Dev Module, Disabled, Default, QIO, 80MHz, 4MB (32Mb), 256000, None on COM8

Step5| Upload the Code

Paste and copy the source code below to Arduino IDE.

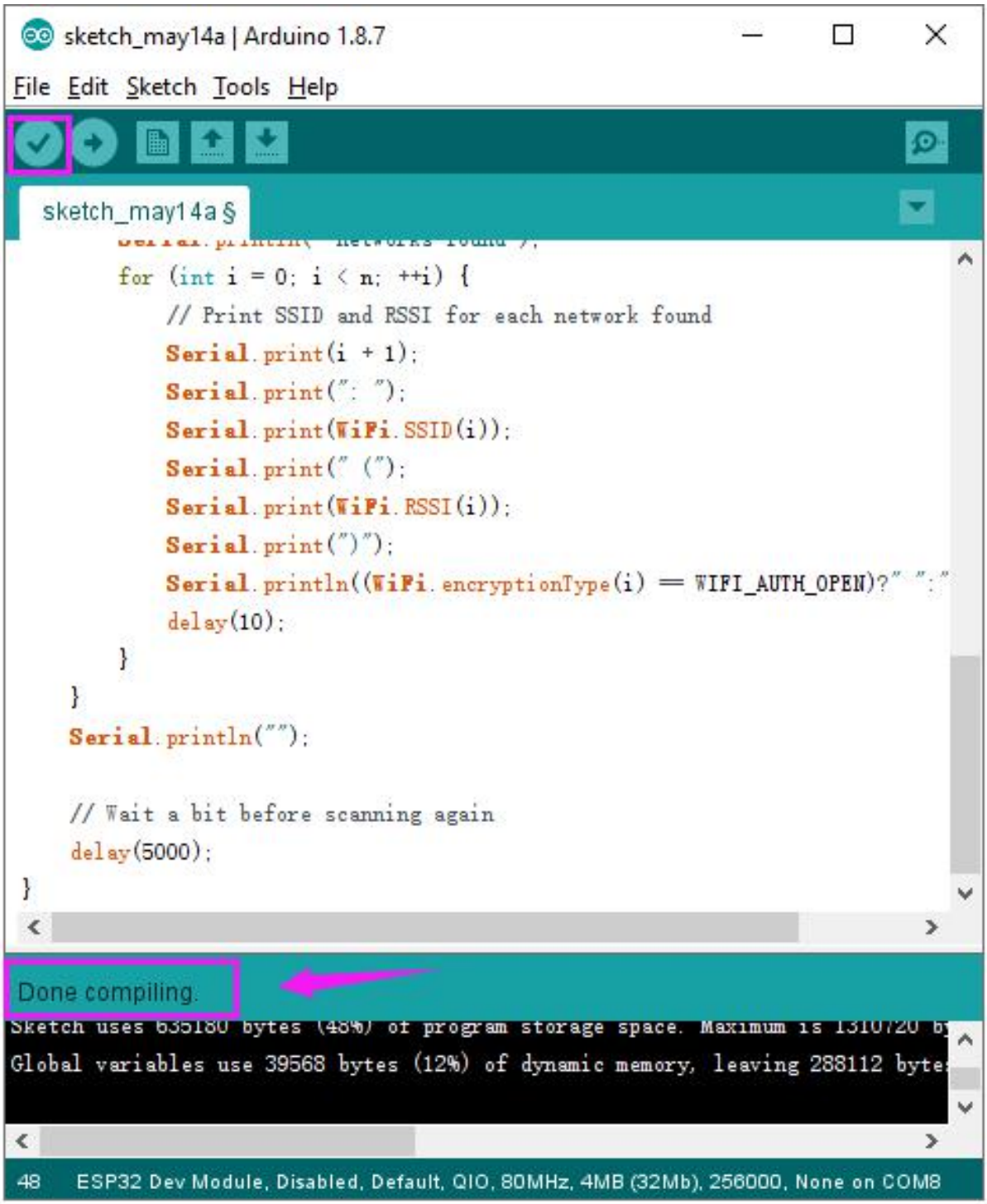
Special Note: when compile and upload the source code, hold the BOOT button on the ESP32 board until upload well the code.

```
/*
 *  This sketch demonstrates how to scan WiFi networks.
 *  The API is almost the same as with the WiFi Shield library,
 *  the most obvious difference being the different file you need to include:
 */
#include "WiFi.h"

void setup()
{
    Serial.begin(115200);

    // Set WiFi to station mode and disconnect from an AP if it was previously connected
    WiFi.mode(WIFI_STA);
    WiFi.disconnect();
    delay(100);

    Serial.println("Setup done");
}

void loop()
{
    Serial.println("scan start");
```

```
    // WiFi.scanNetworks will return the number of networks found
    int n = WiFi.scanNetworks();
    Serial.println("scan done");
    if (n == 0) {
        Serial.println("no networks found");
    } else {
        Serial.print(n);
        Serial.println(" networks found");
        for (int i = 0; i < n; ++i) {
            // Print SSID and RSSI for each network found
            Serial.print(i + 1);
            Serial.print(": ");
            Serial.print(WiFi.SSID(i));
            Serial.print(" (");
            Serial.print(WiFi.RSSI(i));
            Serial.print(")");
            Serial.println((WiFi.encryptionType(i)    ==    WIFI_AUTH_OPEN)?"
":"*");
            delay(10);
        }
    }
    Serial.println("");

    // Wait a bit before scanning again
    delay(5000);
}
```

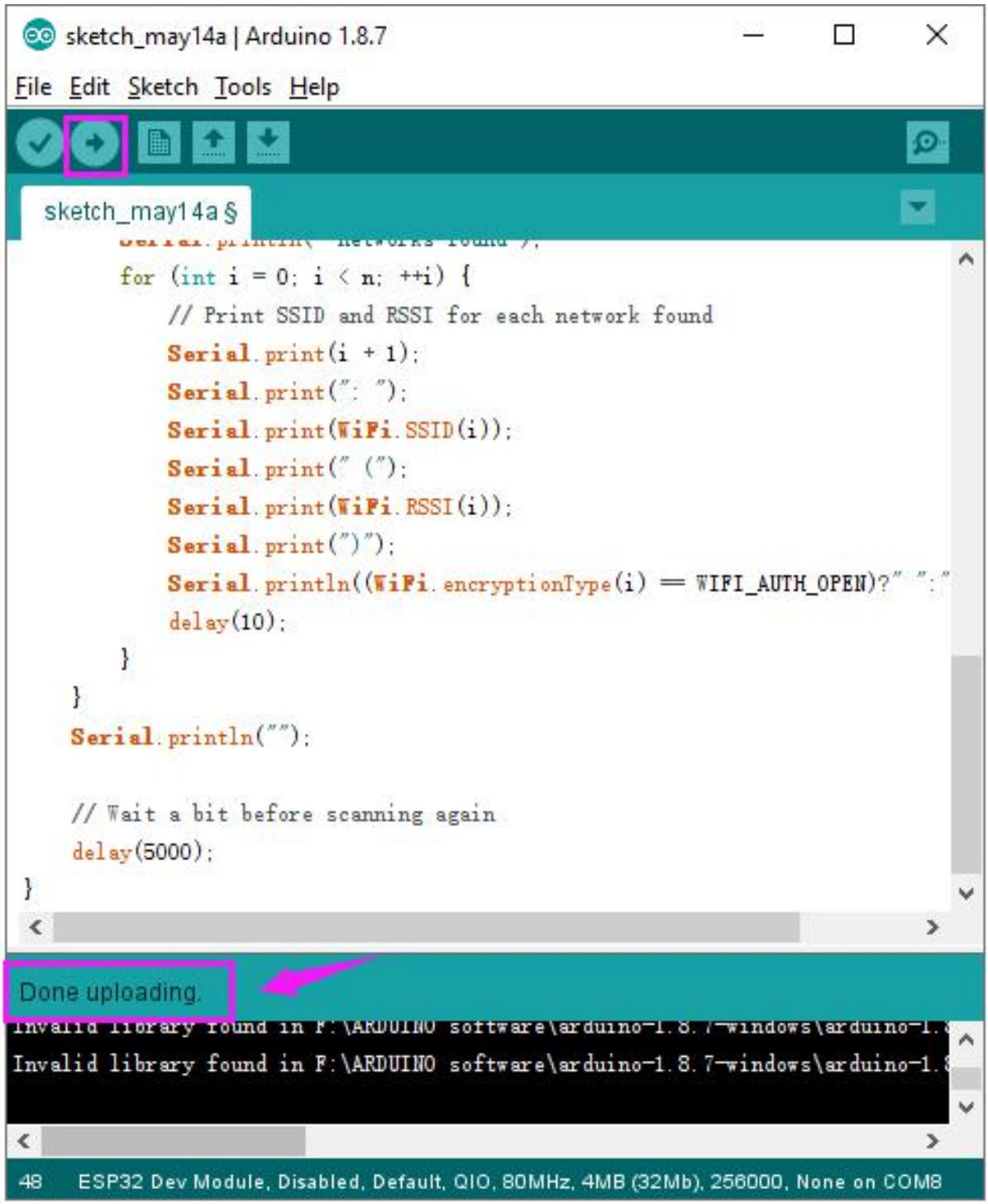
Click verify button to check the errors. If compiling successfully, the message

"Done compiling." will appear in the status bar.



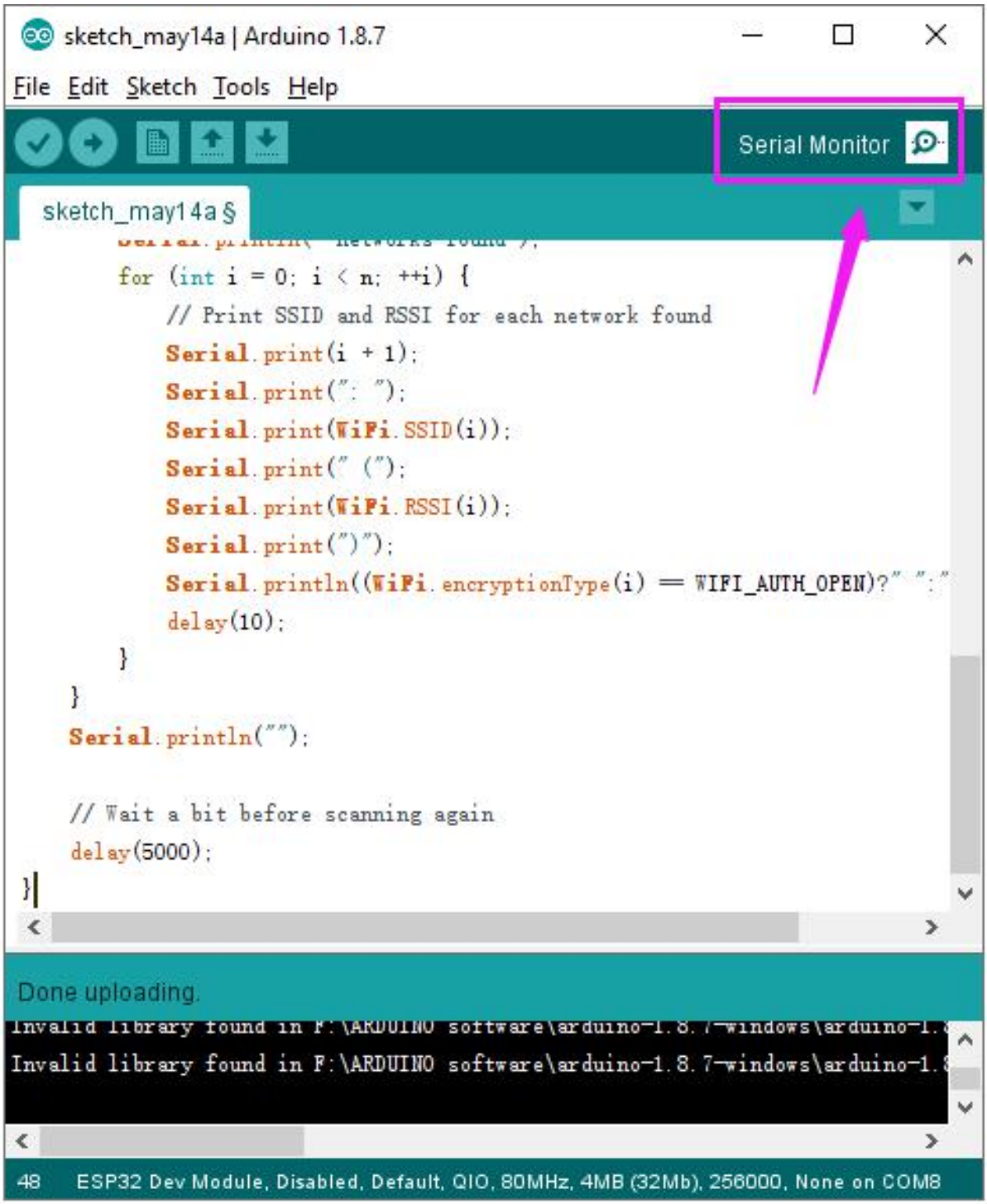
After that, click the "Upload" button to upload the code. If the upload is successful, the message "Done uploading." will appear in the status bar.

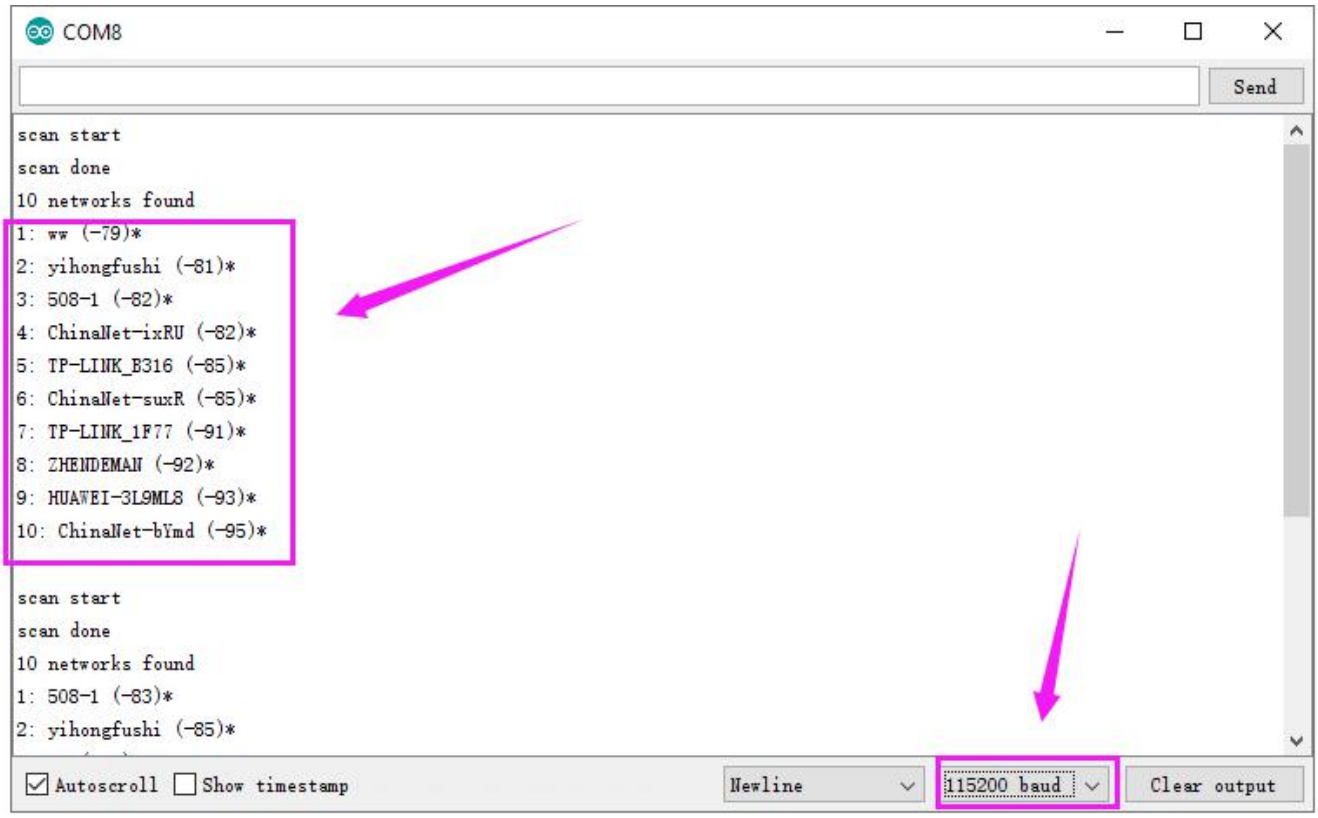
Special Note: if fail to upload, when upload the source code, hold the BOOT button on the ESP32 board until upload well the code.



Done uploading the code to your board, open the serial monitor and set the baud

rate to 115200. You should be able to see the WIFI information on the pop-up window.




COM8
Send
scan start
scan done
10 networks found
1: ww (-79)*
2: yihongfushi (-81)*
3: 508-1 (-82)*
4: ChinaNet-ixRU (-82)*
5: TP-LINK_B316 (-85)*
6: ChinaNet-suxR (-85)*
7: TP-LINK_1F77 (-91)*
8: ZHENDEMAN (-92)*
9: HUAWEI-3L9ML8 (-93)*
10: ChinaNet-bYmd (-95)*
scan start
scan done
10 networks found
1: 508-1 (-83)*
2: yihongfushi (-85)*
Autoscroll
Show timestamp
Newline
115200 baud
Clear output

Resource Download:

https://fs.keyestudio.com/KS0413

Download the ARDUINO Software:

https://www.arduino.cc/en/Main/OldSoftwareReleases#1.5.x