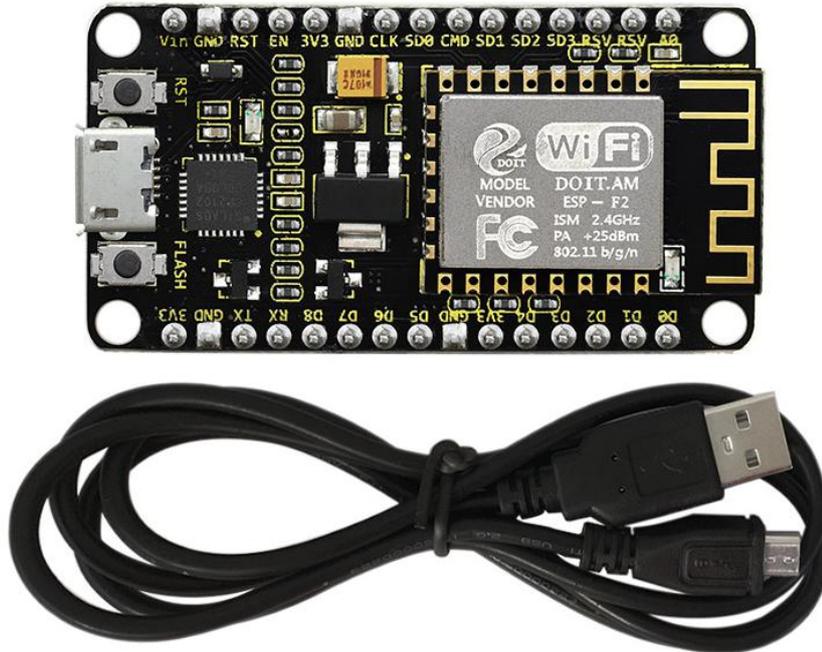




Keyestudio ESP8266 WI-FI Module (Black and Eco-friendly)





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Description:

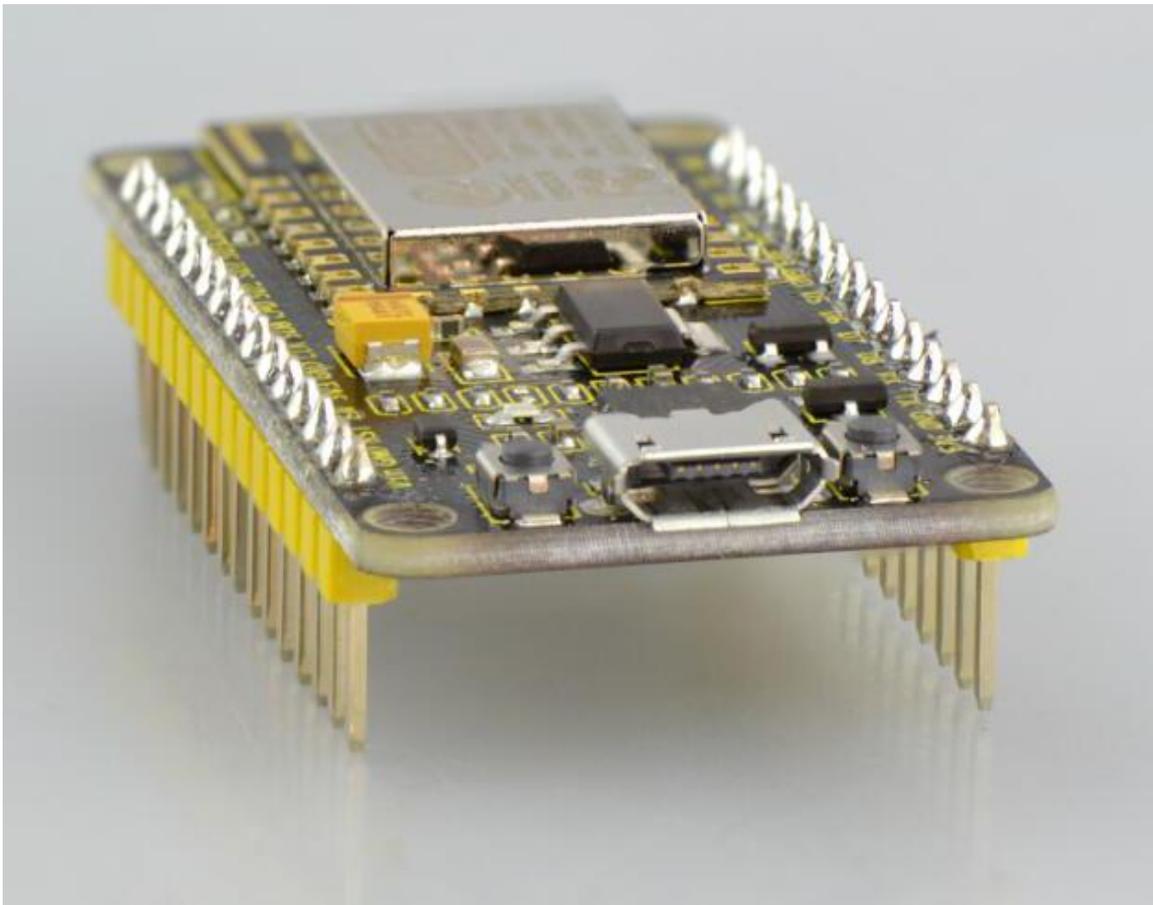
This keyestudio ESP8266 WI-FI development board is based on the ESP8266-12FWIFI module developed by Ai-Thinker.

The processor ESP8266 integrates the industry-leading Tensilica L106 ultra-low-power 32-bit micro MCU in a smaller package, with 16-bit Lite mode. The main frequency supports 80MHz and 160 MHz.

It supports RTOS, integrated with Wi-Fi MAC/BB/RF/PA/LNA. Onboard comes with curved antenna.

This development board is a standalone network controller, which can add networking function to those existing devices.

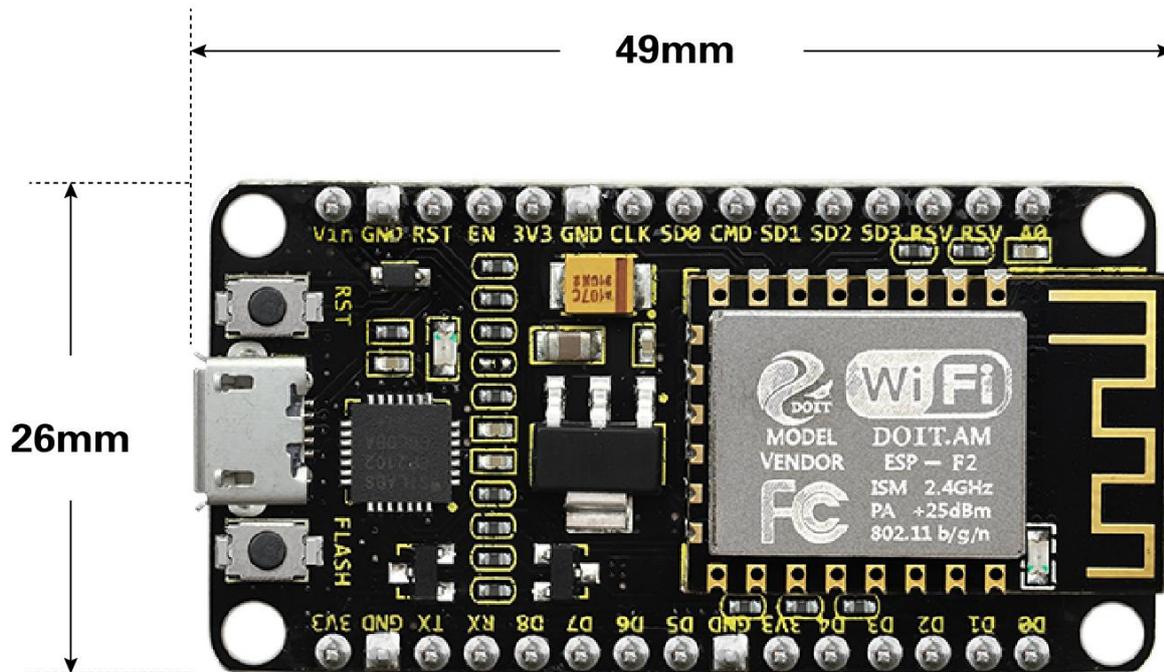
When using, power the board and upload the program via a Micro USB port, and the current supply should be 2A.





Technical Details:

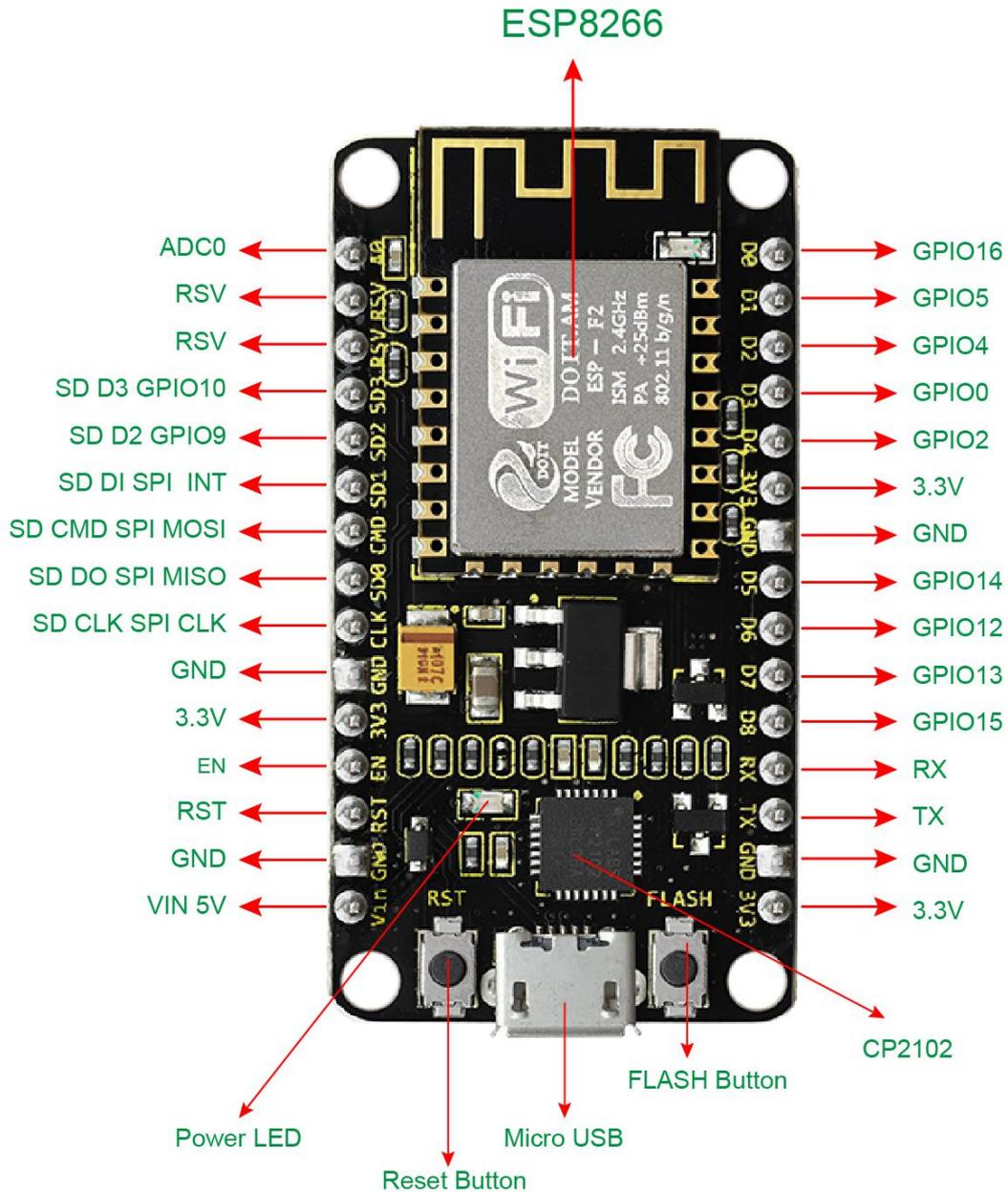
- Microcontroller: ESP8266-12F WIFI Module
- USB to Serial Chip: CP2102-GMR
- Operating Voltage: DC5V
- Input Current: 2A
- Main frequency supports 80 MHz and 160 MHz
- Analog Input Pins: 1(A0)
- Micro USB cable: 1m
- Dimensions: 49mm*26mm*12mm





Element and Interfaces:

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





Specialized Functions of Some Pins:

- Serial communication pins: RX and TX
- SPI communication pins: CLK(CLK); SD0(MISO); CMD(MOSI); SD1(INT).
- SD Card communication pins: D3(SD3); D2(SD2); D1(SD1); CMD(CMD); D0(SD0); CLK(CLK).
- Analog output pin: A0
- GPIO pins: D0(GPIO16); D1(GPIO5); D2(GPIO4); D3(GPIO0); D4(GPIO2); D5(GPIO14); D6(GPIO12); D7(GPIO13); D8(GPIO15); RX(GPIO3); TX(GPIO1); SD3(GPIO10); SD2(GPIO9)



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>

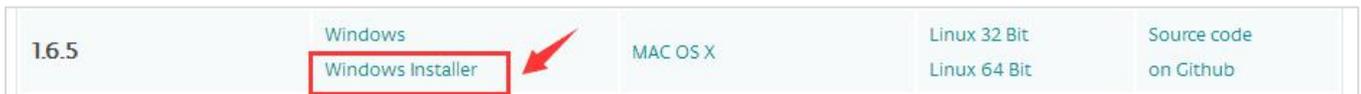
NOTE: this control board is only compatible with Arduino 1.6.5 version or latest. In the following, we will download the Arduino 1.6.5 version.

HOME	BUY	SOFTWARE	PRODUCTS	EDU	RESOURCES	COMMUNITY	HELP
		Windows Installer				Linux ARM	on Github
1.6.10		Windows Windows Installer		MAC OS X		Linux 32 Bit Linux 64 Bit Linux ARM	Source code on Github
1.6.9		Windows Windows Installer		MAC OS X		Linux 32 Bit Linux 64 Bit Linux ARM	Source code on Github
1.6.8		Windows Windows Installer		MAC OS X		Linux 32 Bit Linux 64 Bit	Source code on Github
1.6.7		Windows Windows Installer		MAC OS X		Linux 32 Bit Linux 64 Bit	Source code on Github
1.6.6		Windows Windows Installer		MAC OS X		Linux 32 Bit Linux 64 Bit	Source code on Github
1.6.5		Windows Windows Installer		MAC OS X		Linux 32 Bit Linux 64 Bit	Source code on Github
1.6.4		Windows Windows Installer		MAC OS X		Linux 32 Bit Linux 64 Bit	Source code on Github
1.6.3		Windows Windows Installer		MAC OS X		Linux 32 Bit Linux 64 Bit	Source code on Github

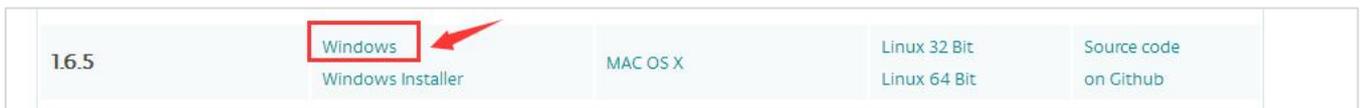


In this Windows system page, there are two options. One is Windows version, the other is Windows Installer.

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



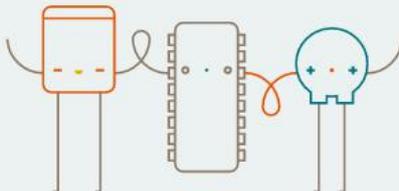
For simple Windows version, you can download the software directly, do not need to install, just directly use the software after unzip the file.



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

Contribute to the Arduino Software

Consider supporting the Arduino Software by contributing to its development. (US tax payers, please note this contribution is not tax deductible). [Learn more on how your contribution will be used.](#)



SINCE MARCH 2015, THE ARDUINO IDE HAS BEEN DOWNLOADED **24,353,248** TIMES. (IMPRESSIVE!) NO LONGER JUST FOR ARDUINO AND GENUINO BOARDS, HUNDREDS OF COMPANIES AROUND THE WORLD ARE USING THE IDE TO PROGRAM THEIR DEVICES, INCLUDING COMPATIBLES, CLONES, AND EVEN COUNTERFEITS. HELP ACCELERATE ITS DEVELOPMENT WITH A SMALL CONTRIBUTION! REMEMBER: OPEN SOURCE IS LOVE!

\$3 \$5 \$10 \$25 \$50 OTHER

JUST DOWNLOAD **CONTRIBUTE & DOWNLOAD**



Click **JUST DOWNLOAD**.

When the ZIP file is downloaded well to your computer, you can directly unzip the file. Open the Arduino-1.6.5-r5 folder, you should get it as follows.



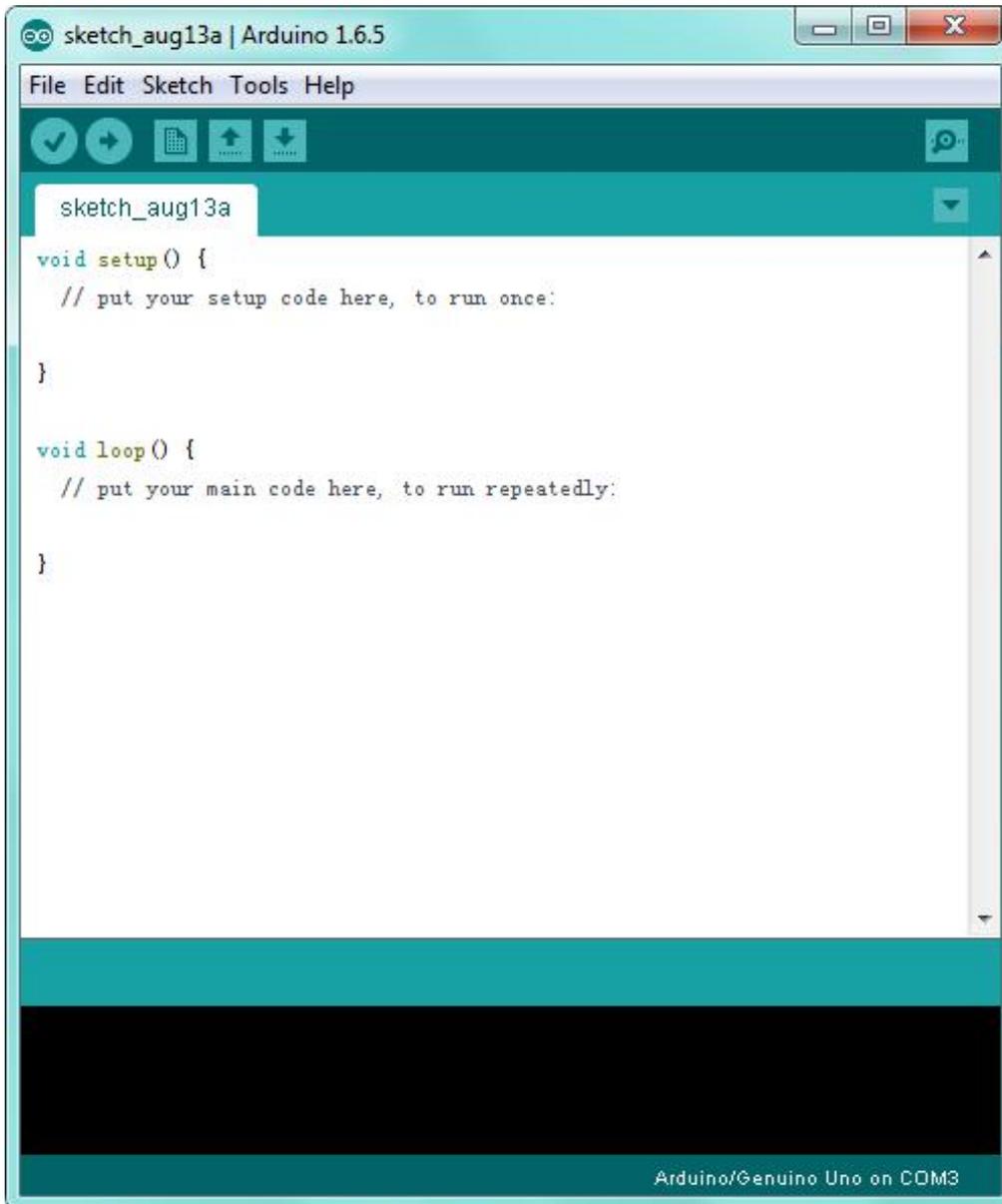
Local Disk (F:) > arduino-1.6.5-r5-windows > arduino-1.6.5-r5 >

ry ▾ Share with ▾ New folder

Name	Date modified	Type	Size
dist	2015/8/28 9:32	File folder	
drivers	2015/8/28 9:32	File folder	
examples	2015/8/28 9:32	File folder	
hardware	2015/8/28 9:32	File folder	
java	2015/8/28 9:32	File folder	
lib	2015/8/28 9:32	File folder	
libraries	2015/8/28 9:32	File folder	
reference	2015/8/28 9:32	File folder	
tools	2015/8/28 9:32	File folder	
 arduino	2015/8/28 9:32	Application	393 KB
 arduino.l4j	2015/8/28 9:32	Configuration settings	1 KB
 arduino_debug	2015/8/28 9:32	Application	390 KB
 arduino_debug.l4j	2015/8/28 9:32	Configuration settings	1 KB
 libusb0.dll	2015/8/28 9:32	Application extension	43 KB
 msvcp100.dll	2015/8/28 9:32	Application extension	412 KB
 msvcr100.dll	2015/8/28 9:32	Application extension	753 KB
 revisions	2015/8/28 9:32	Text Document	67 KB



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





Step2| Install 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 package download link here.

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

You can download the driver software for different systems.

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 (v10.1.4)

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)

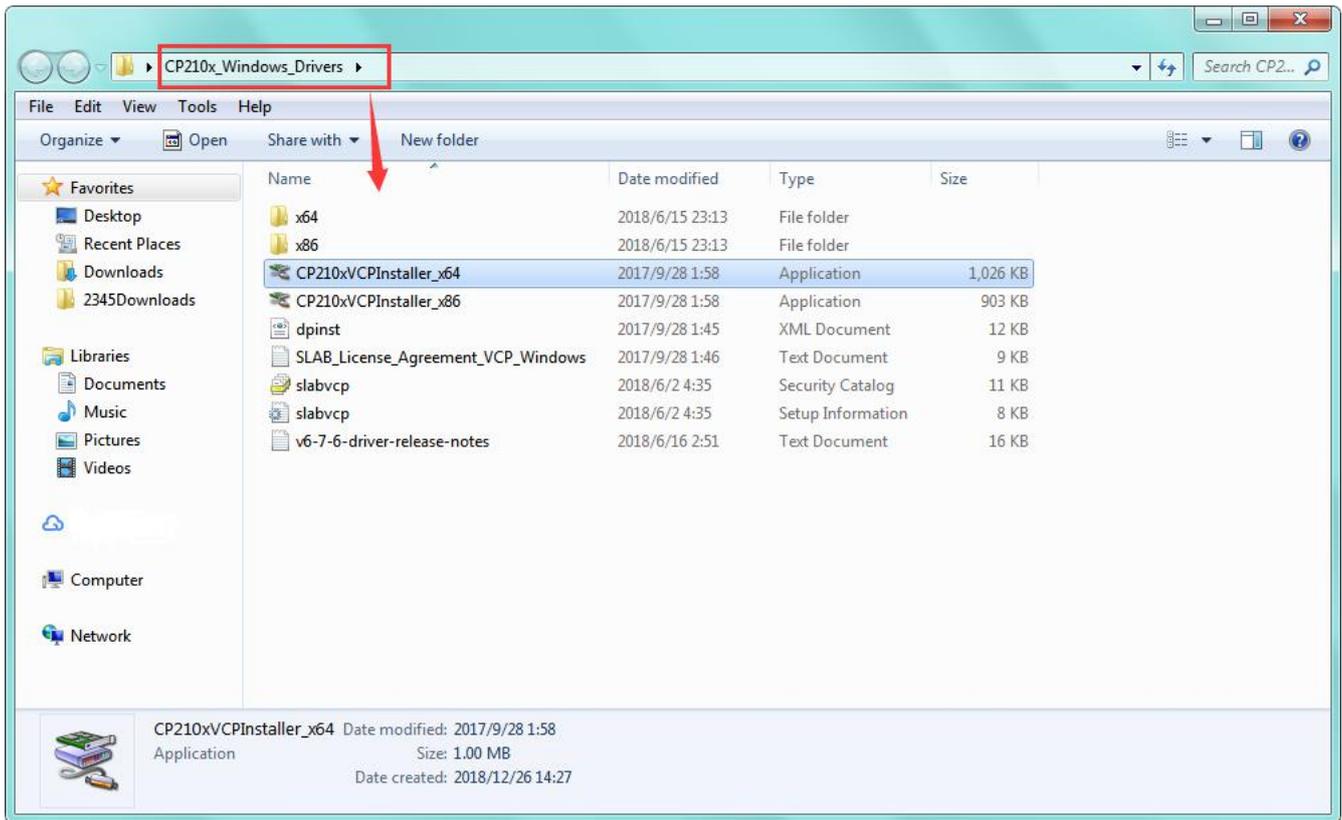
Platform	Software	Release Notes
Windows 7/8/8.1	Download VCP[®] (5.3 MB) (Default)	Download VCP[®] Revision History
Windows 7/8/8.1	Download VCP[®] with Serial Enumeration (5.3 MB) Learn More >	Download VCP[®] Revision History

For example, download for Windows 7, you can get the driver package **CP210x_Windows_Drivers**.



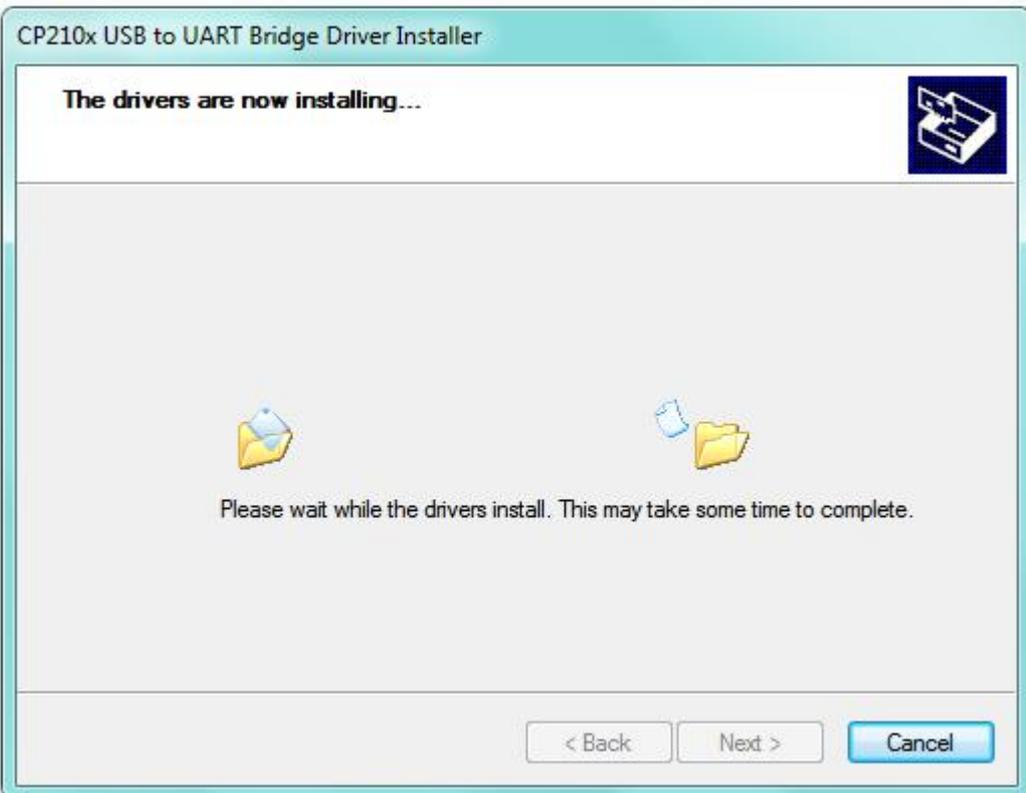
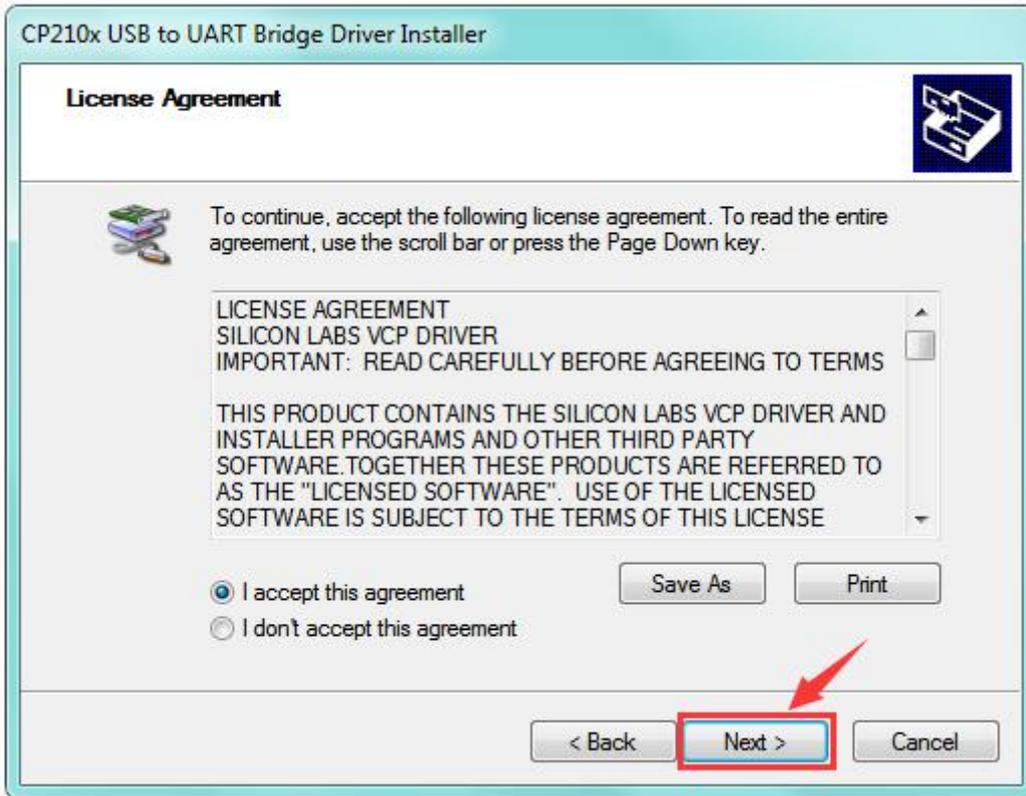
CP210x_Windows_Drivers

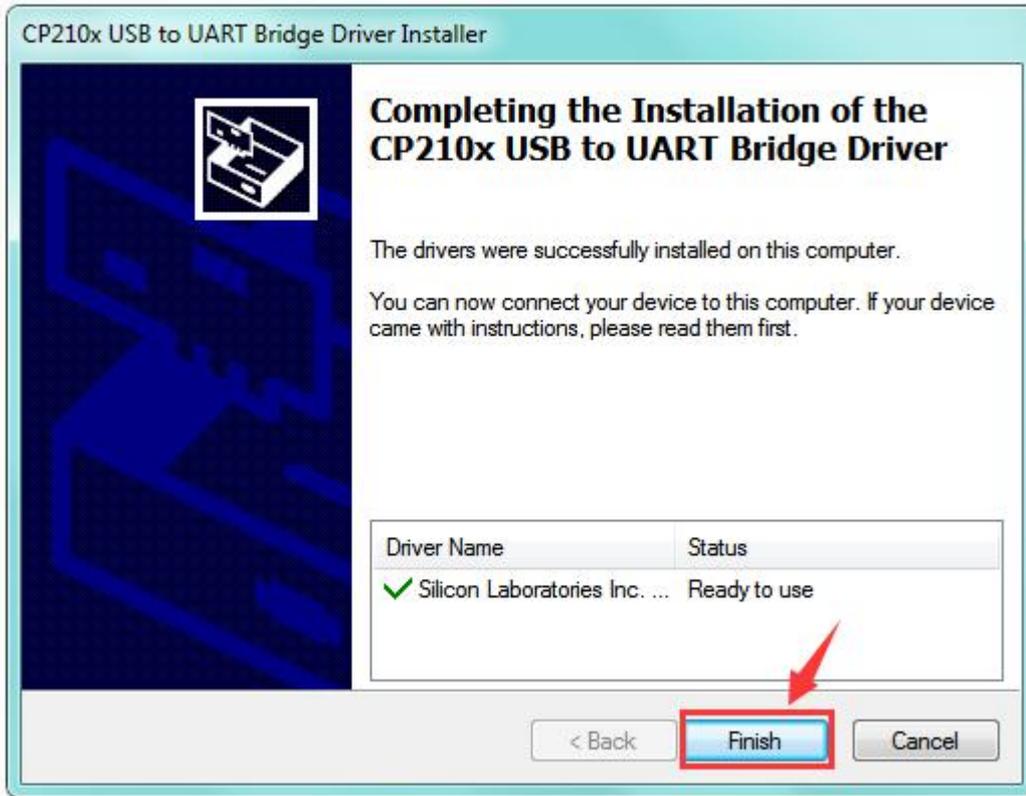
Unzip the package to install the driver.



Then double click **CP210xVCPInstaller_x64** to install the driver. Shown below.







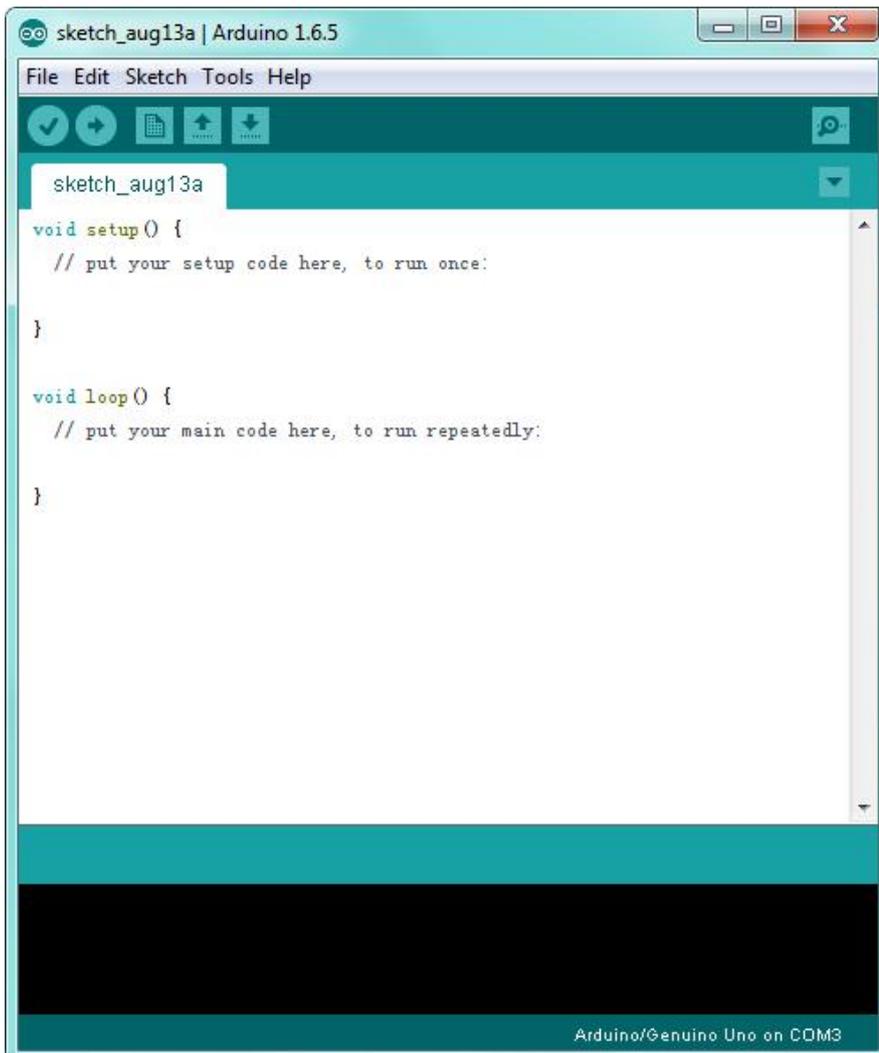


Step3 | Install the ESP8266 with Arduino

Double-click the icon of Arduino 1.6.5 downloaded well, you will get the interface shown below.

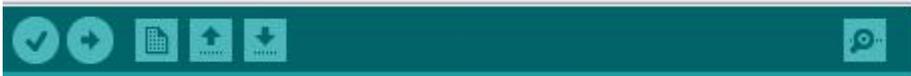


(**Note:** if the Arduino software loads in the wrong language, you can change it in the preferences dialog. See [the environment page](#) for details.)





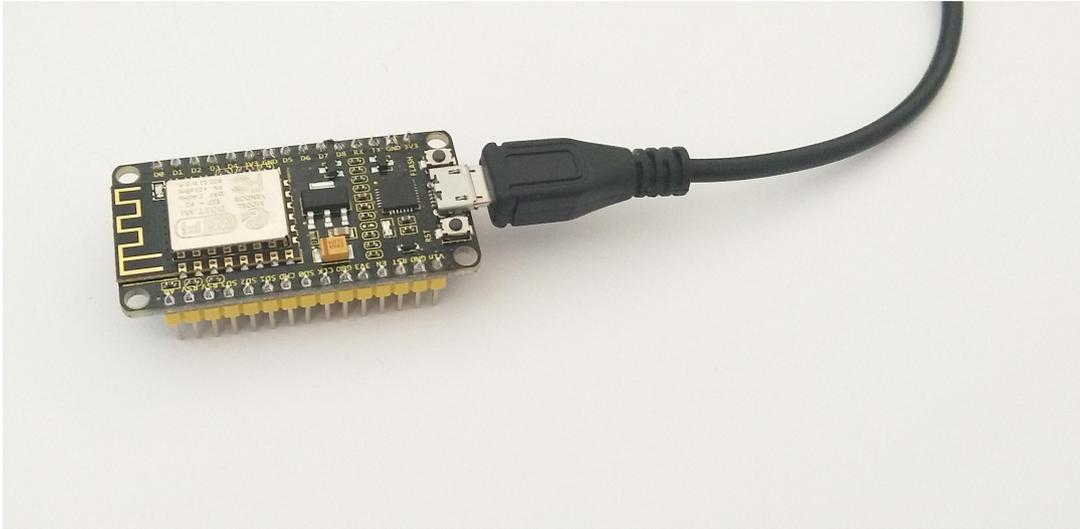
The functions of each button on the Toolbar are listed below:



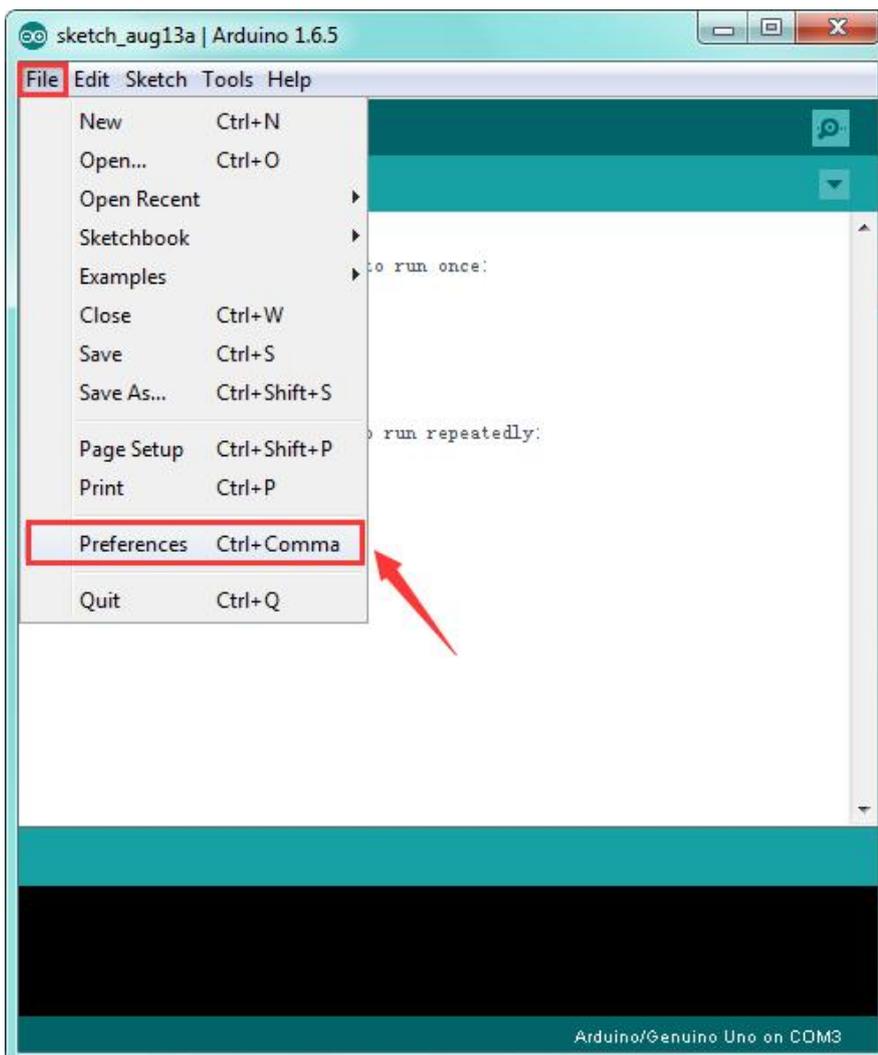
 Verify/Compile	Check the code for errors
 Upload	Upload the current Sketch to the Arduino
 New	Create a new blank Sketch
 Open	Show a list of Sketches
 Save	Save the current Sketch
 Serial Monitor	Display the serial data being sent from the Arduino



Firstly, plug one end of your USB cable into the Keyestudio ESP8266 WI-FI module and the other into a USB socket on your computer.



Then open the Arduino IDE, click the "File" to select the "Preferences".



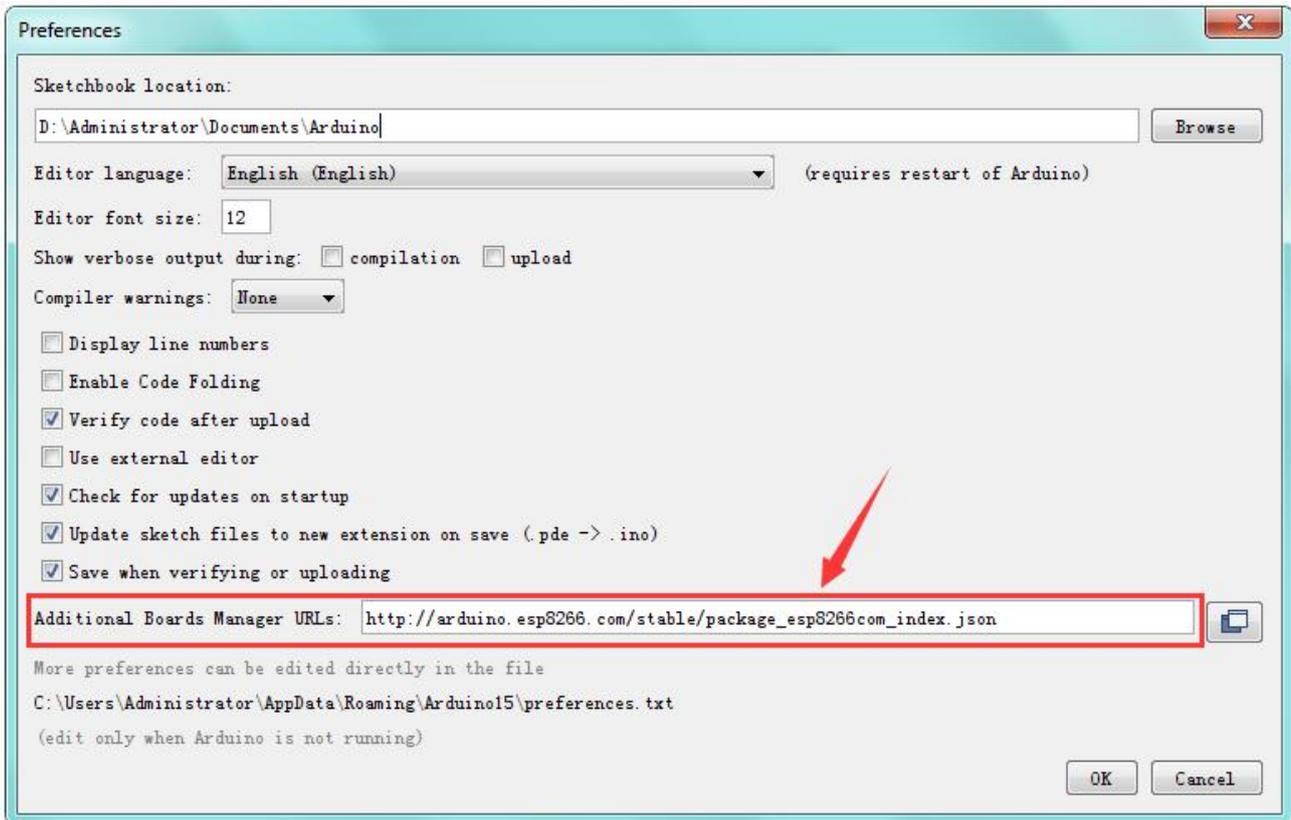


The pop-up interface is shown below.

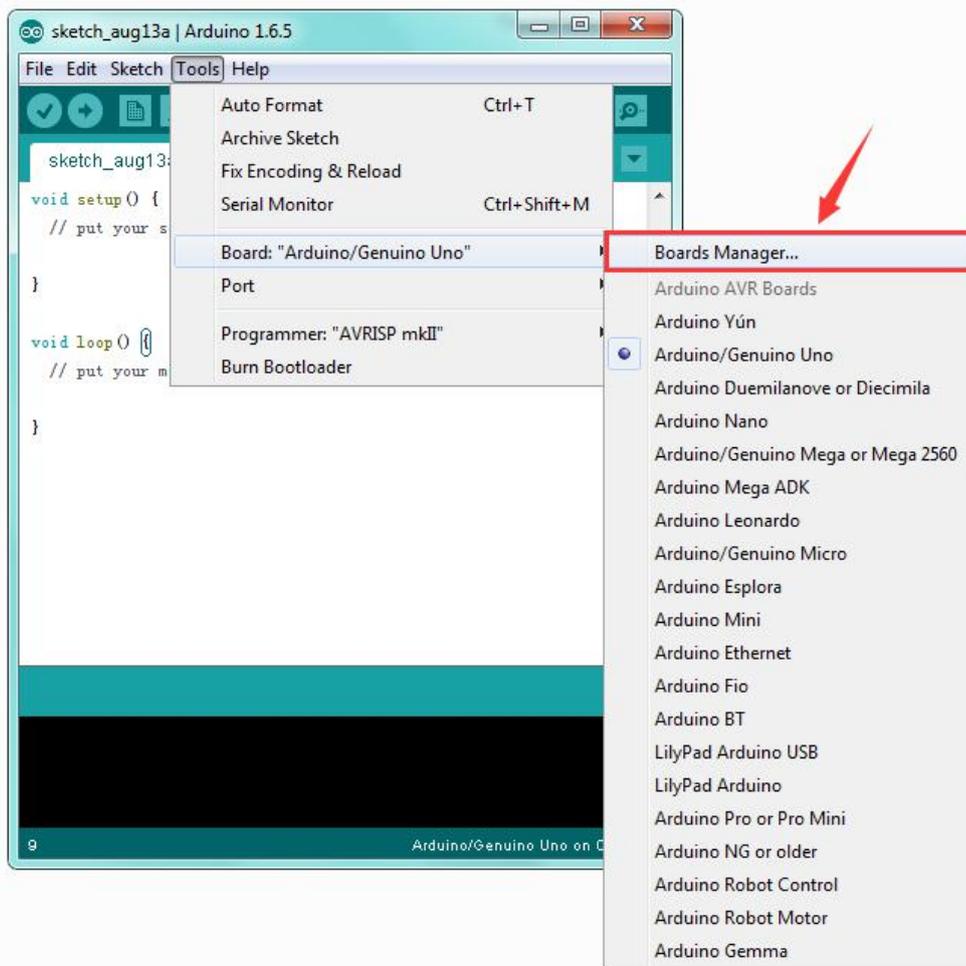
See the "Additional Boards Manager URLs", copy and paste the link below:

http://arduino.esp8266.com/stable/package_esp8266com_index.json

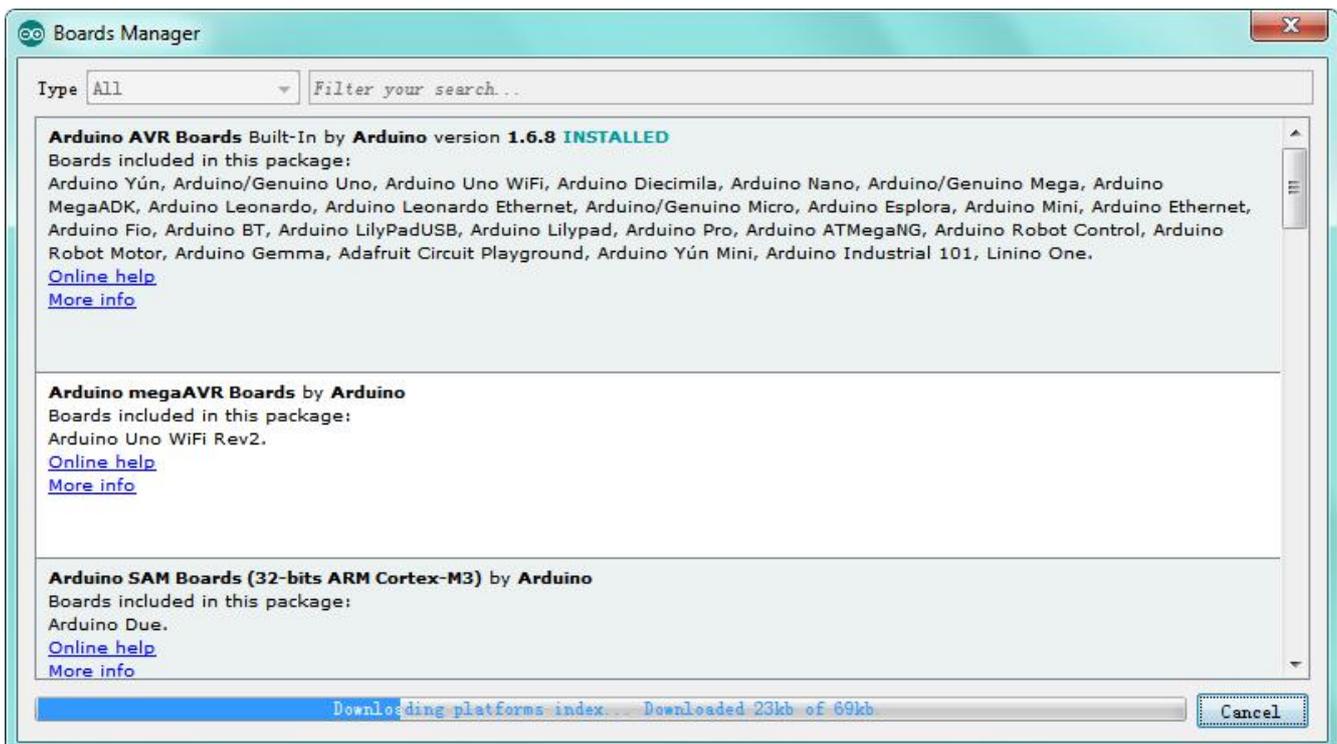
and then click OK.



After that, click "Tools", for "Board", enter the Boards Manager, it will automatically download the relevant file. Shown below.

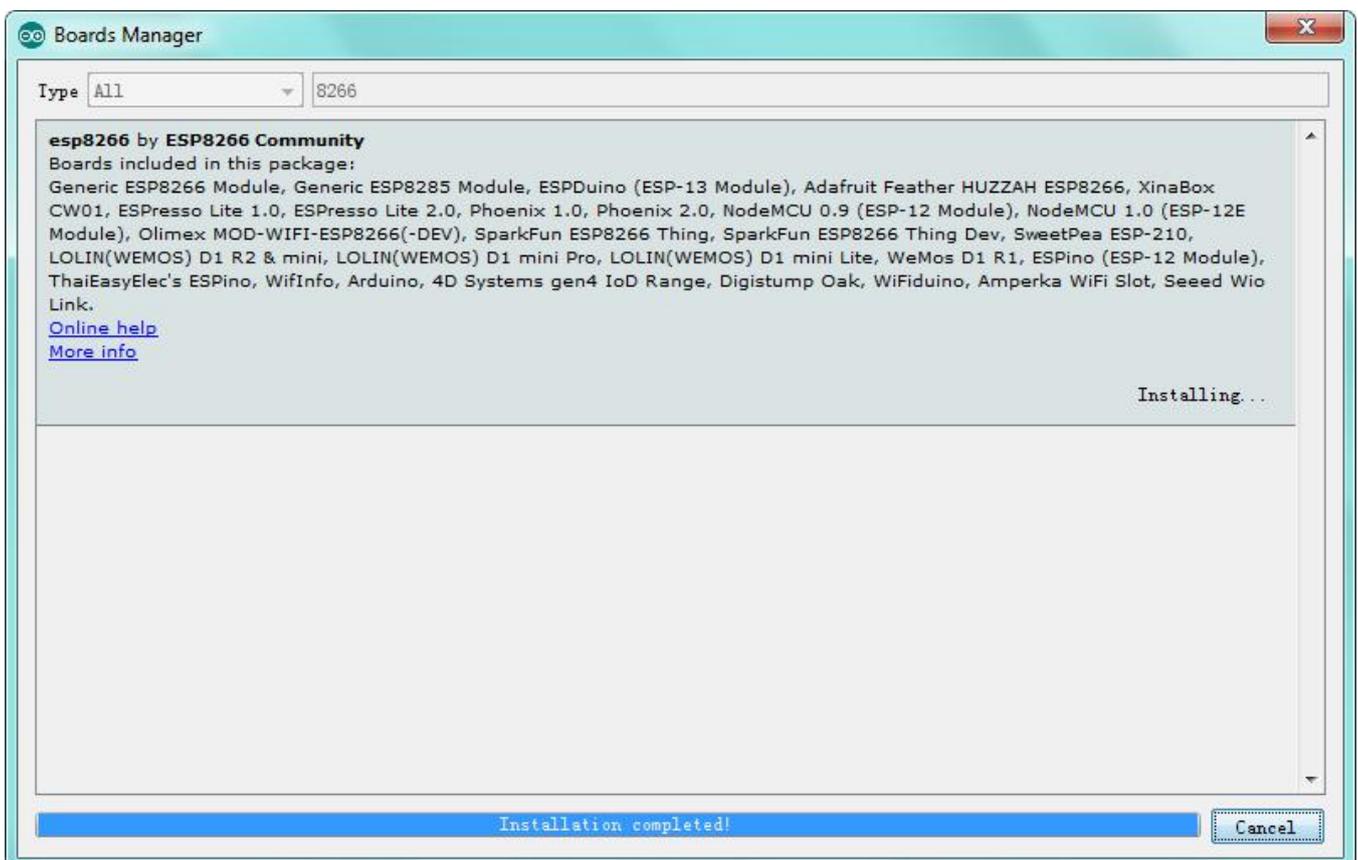
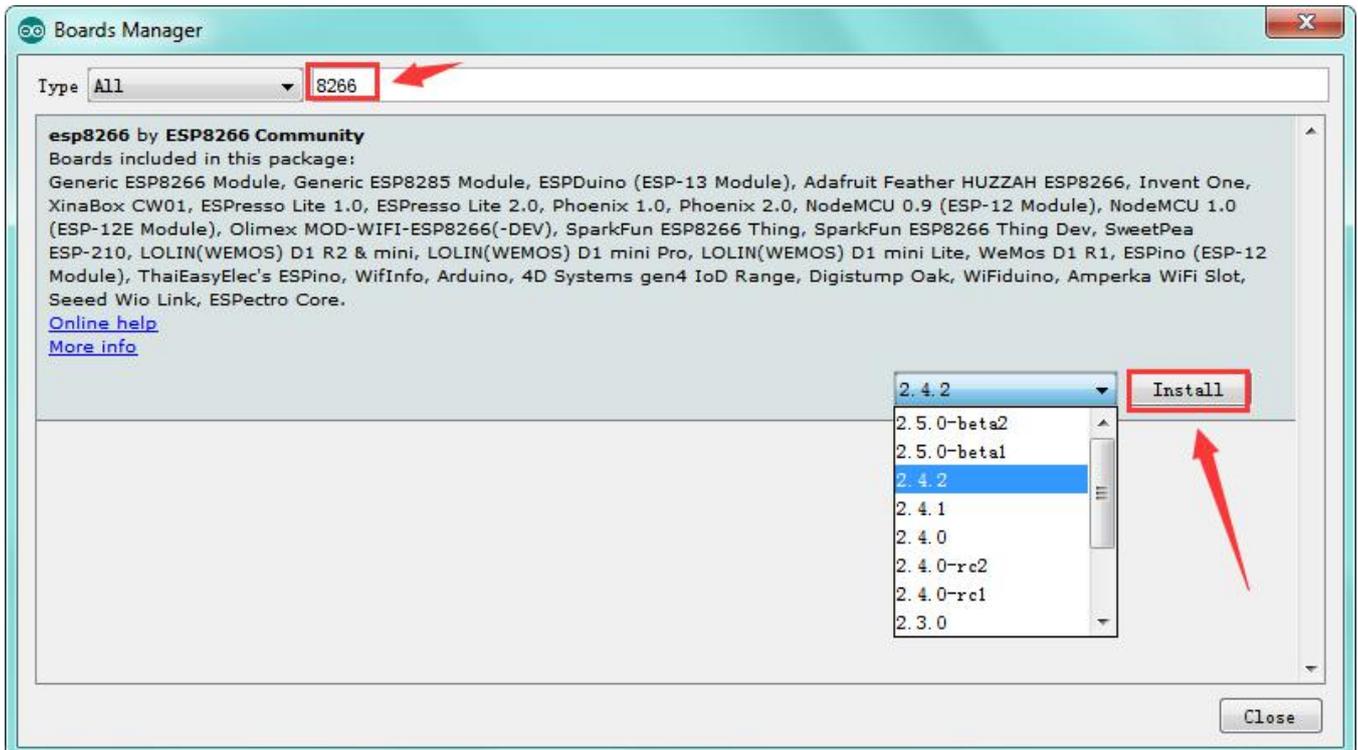


Pop up the following window:



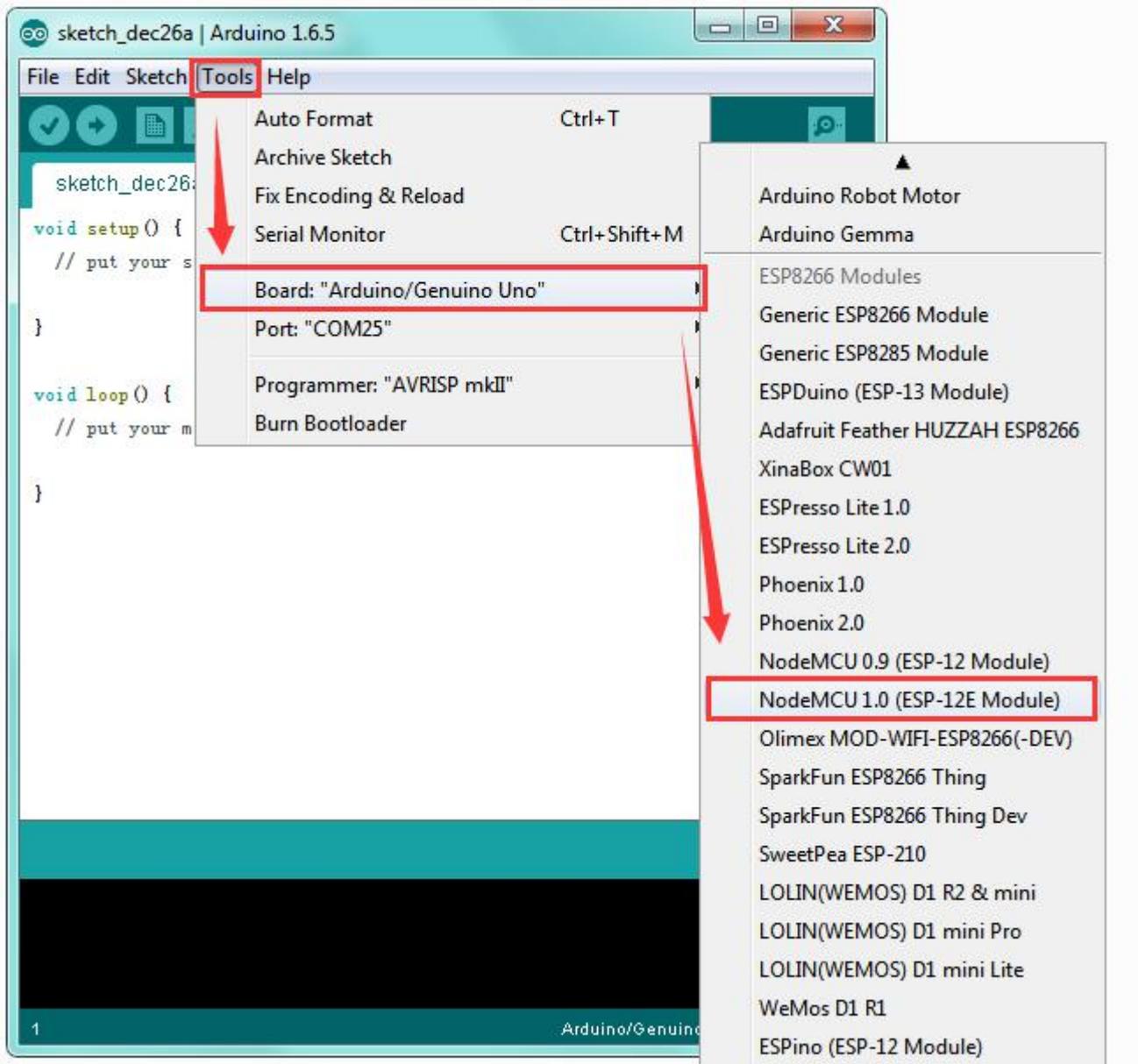


Done downloading the relevant file, it will pop up the window below.
Then enter the 8266 on the blank bar and click Install.





Installation completed, click Close, then click "Tools", for "Board", you should see the **NodeMCU 1.0 (ESP-12E Module)**. Shown below.



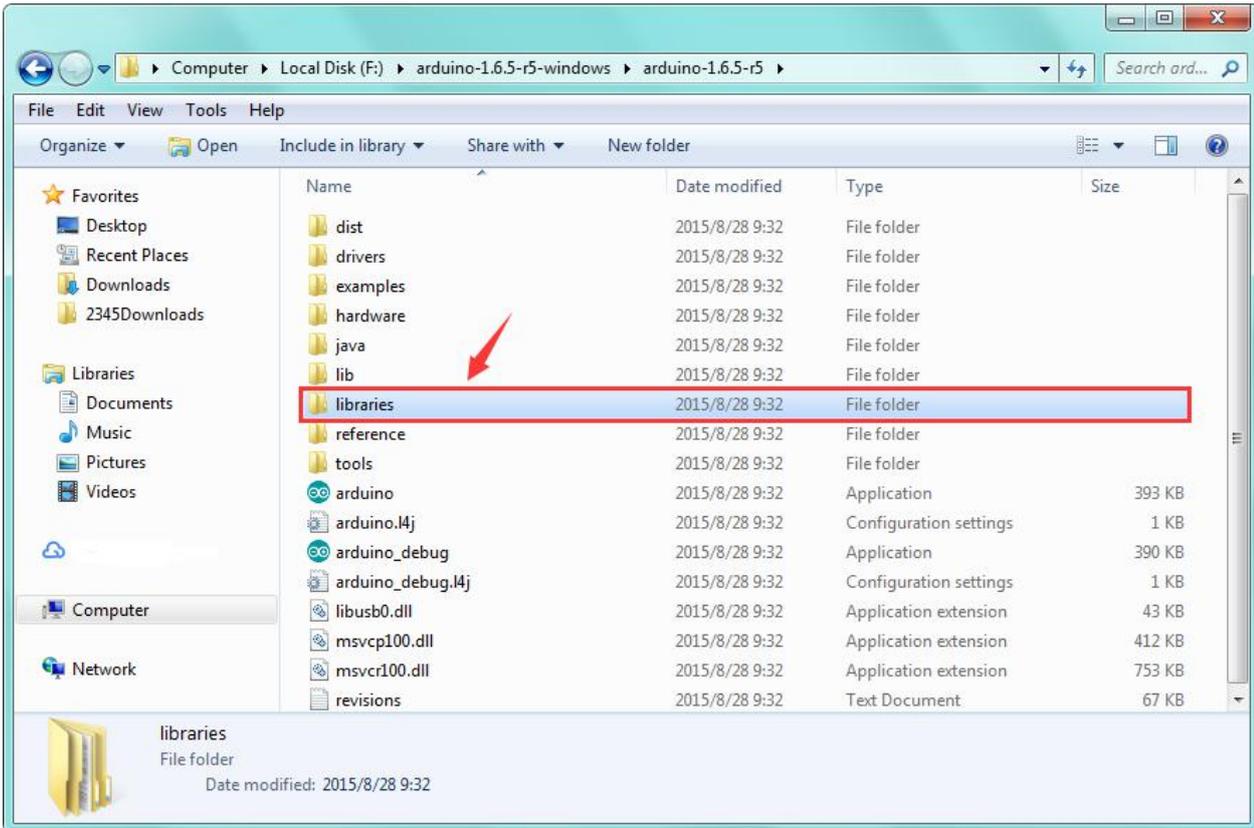


Step4 | Add the Libraries

Before upload the code to test your board, you should first add the library ESP8266WiFi into the libraries folder of Arduino-1.6.5-r5.

You can click the link to download the library needed.

https://drive.google.com/open?id=1_Y5IKCrDgY3AeovXZKorQ8FVv2oIUOOL



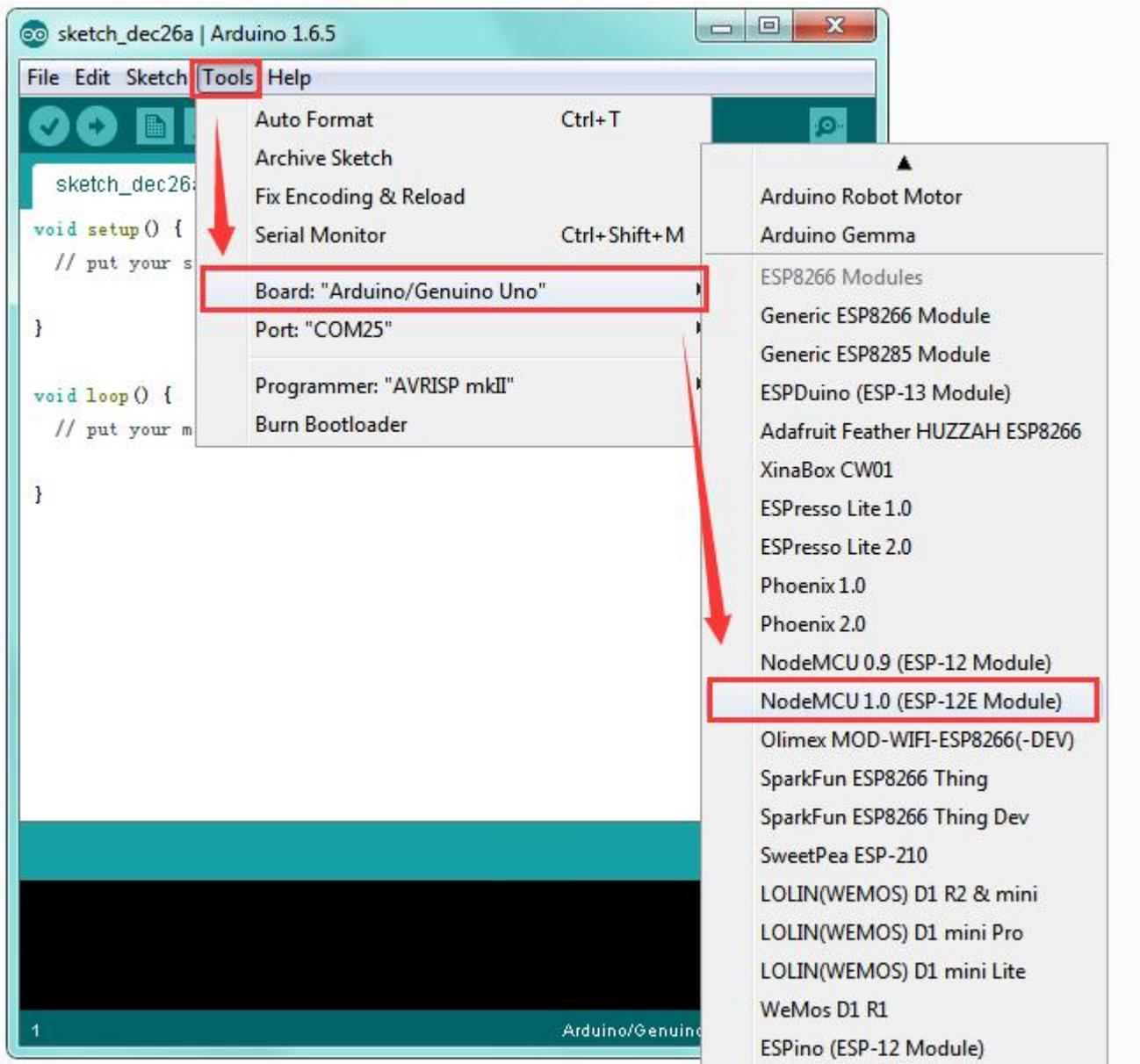
Note:

Before adding the library, you have opened the Arduino IDE. After add the library successfully, must restart the IDE, so the library can work.

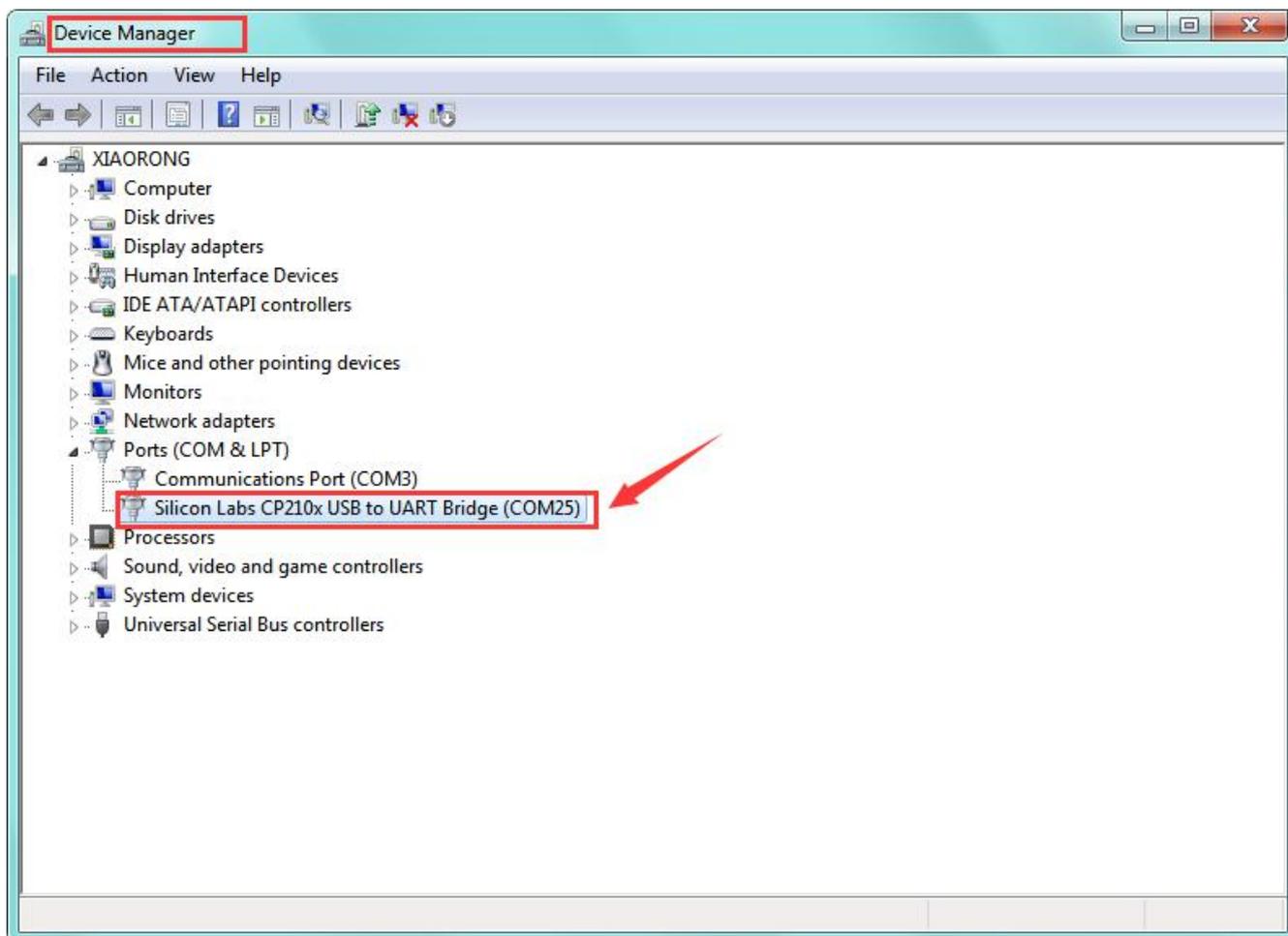


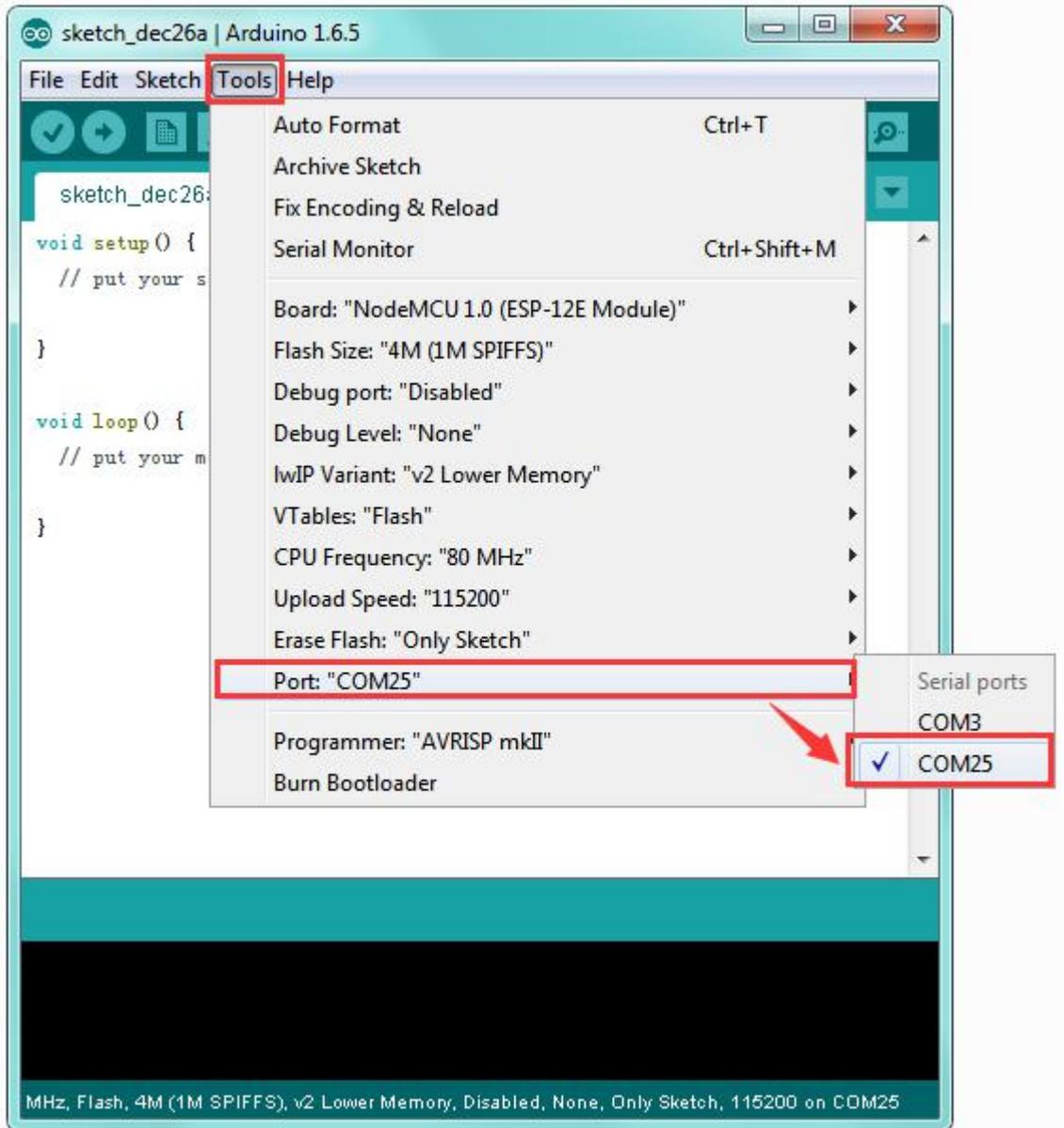
Step5| Select the Board and Serial Port

Open the Arduino IDE, you'll need to click the "Tools", then select the Board and the Serial Port.



You can check out the Serial Port on your computer's Device Manager. Select your proper COM Port.







Step6 | Upload the Code

Add well the libraries mentioned above, and select the proper Board and Port, you should upload the code to test the module.

Below is an example code, you can copy and paste it on Arduino IDE.

```
*****  
/*  
 * 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 "ESP8266WiFi.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) == ENC_TYPE_NONE)?" ":"*");
    delay(10);
  }
}

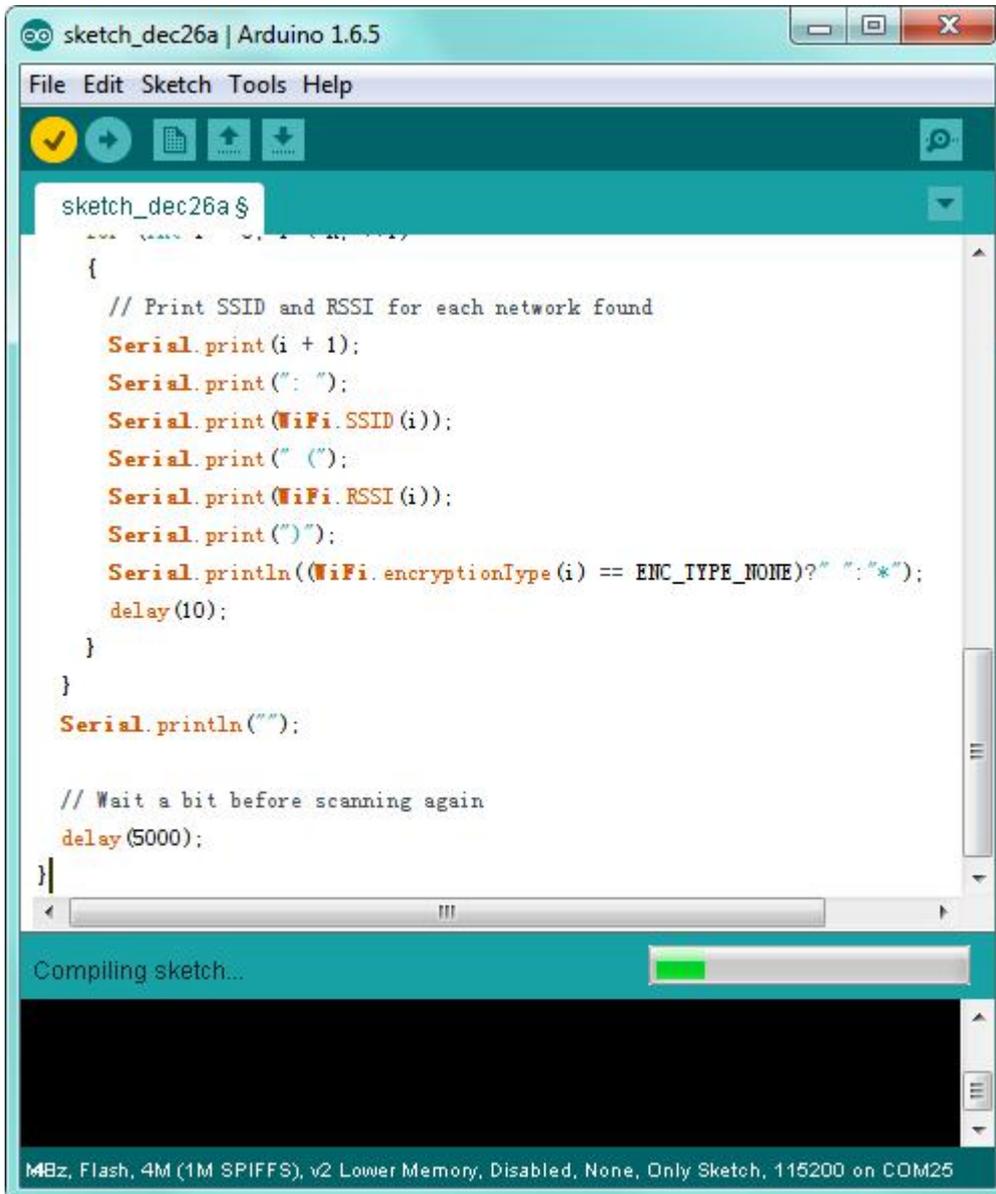
Serial.println("");

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

*****
```



After copy and paste the code on IDE, click the compile button, if compiling successfully, the message "Done compiling." will appear in the status bar.





The screenshot shows the Arduino IDE interface. The main editor window displays the following code:

```
sketch_dec26a $
{
  // 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) == ENC_TYPE_NONE)? " ":"*");
  delay(10);
}
}
Serial.println("");

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

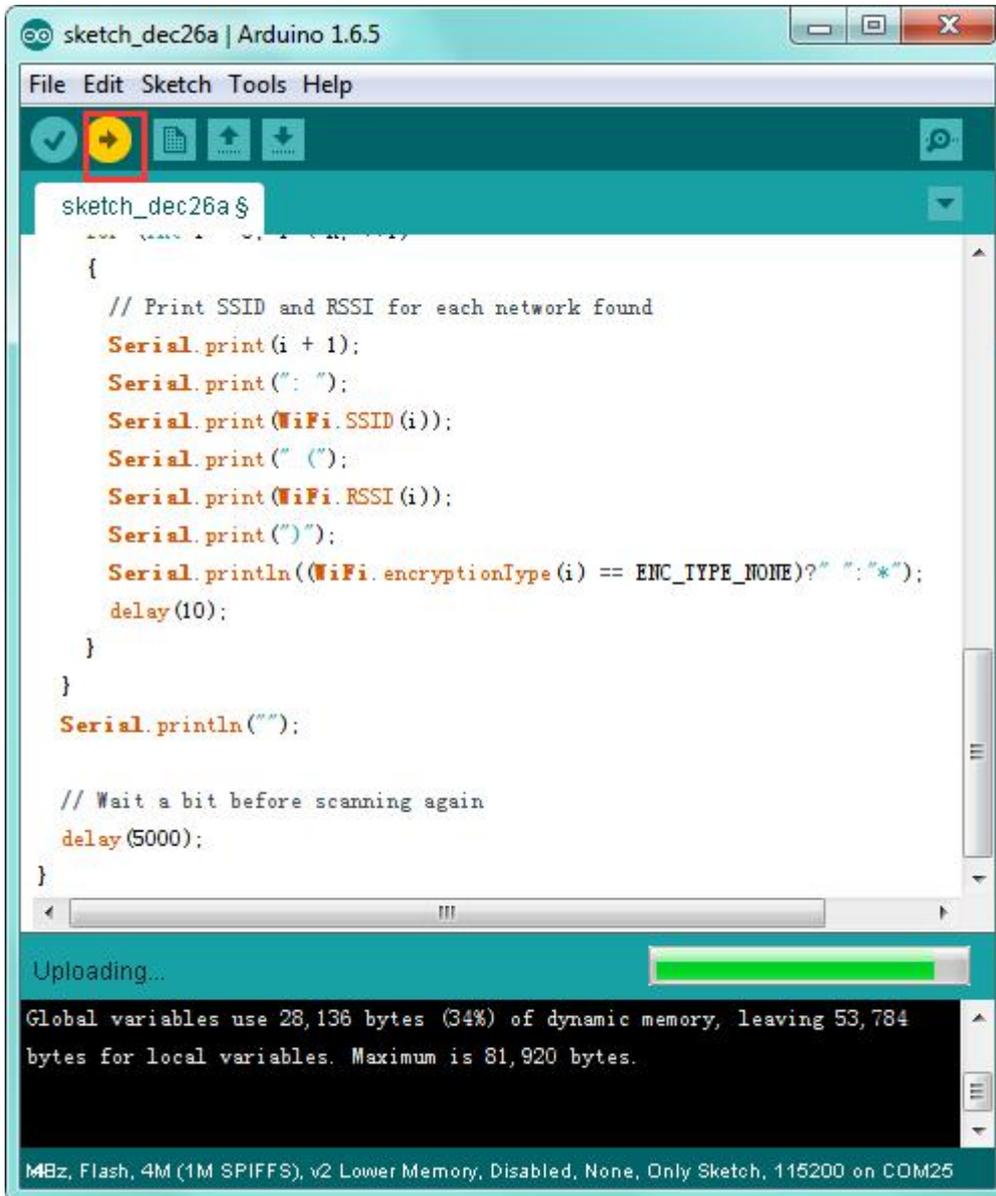
Below the code editor, a status bar indicates "Done compiling." with a red arrow pointing to it. Below the status bar, a message box displays the following text:

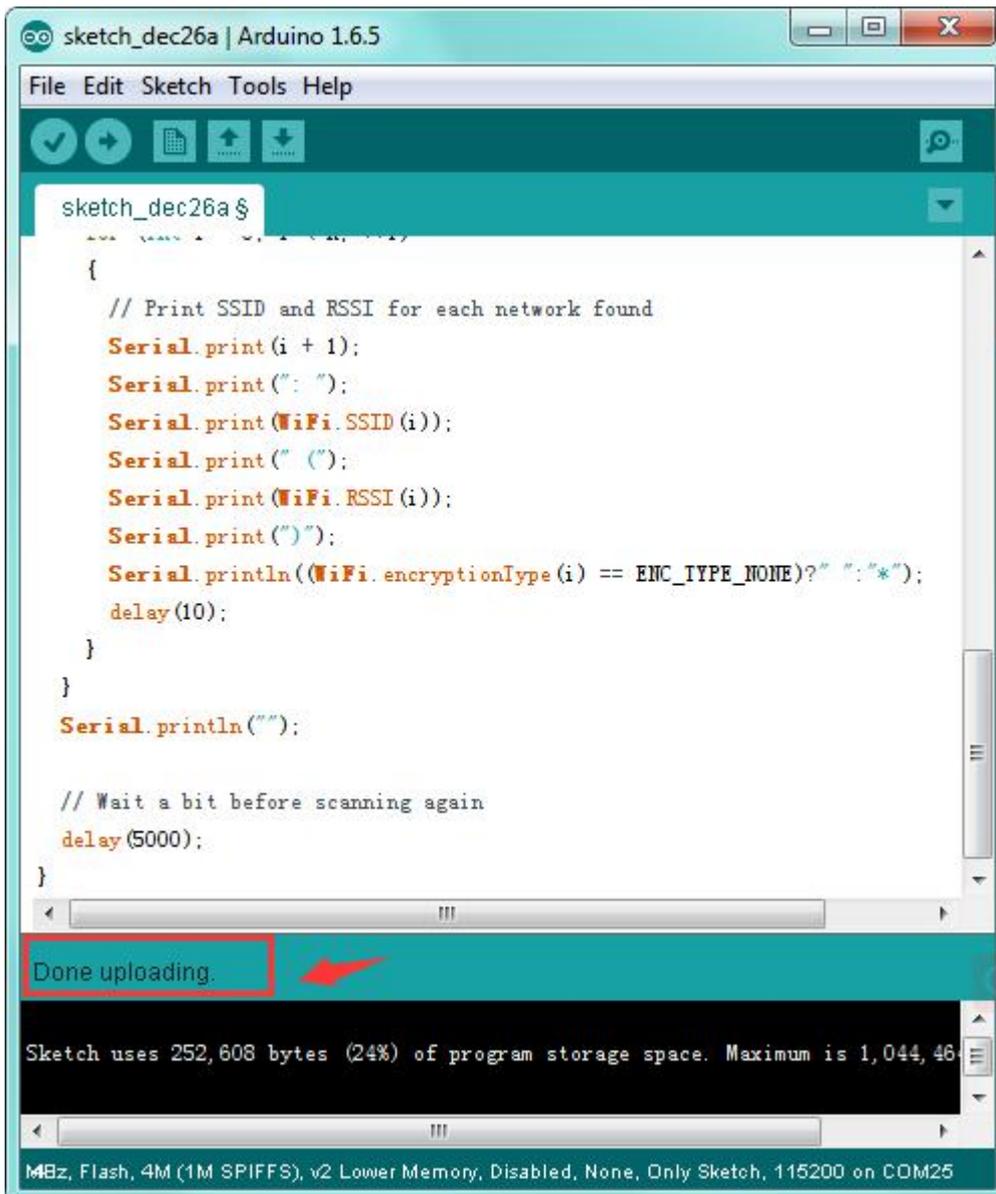
```
Global variables use 28,136 bytes (34%) of dynamic memory, leaving 53,784
bytes for local variables. Maximum is 81,920 bytes.
```

At the bottom of the IDE, the hardware configuration is shown: "1MBz, Flash, 4M (1M SPIFFS), v2 Lower Memory, Disabled, None, Only Sketch, 115200 on COM25".



Then click the "Upload" button, if the upload is successful, the message "Done uploading." will appear in the status bar.

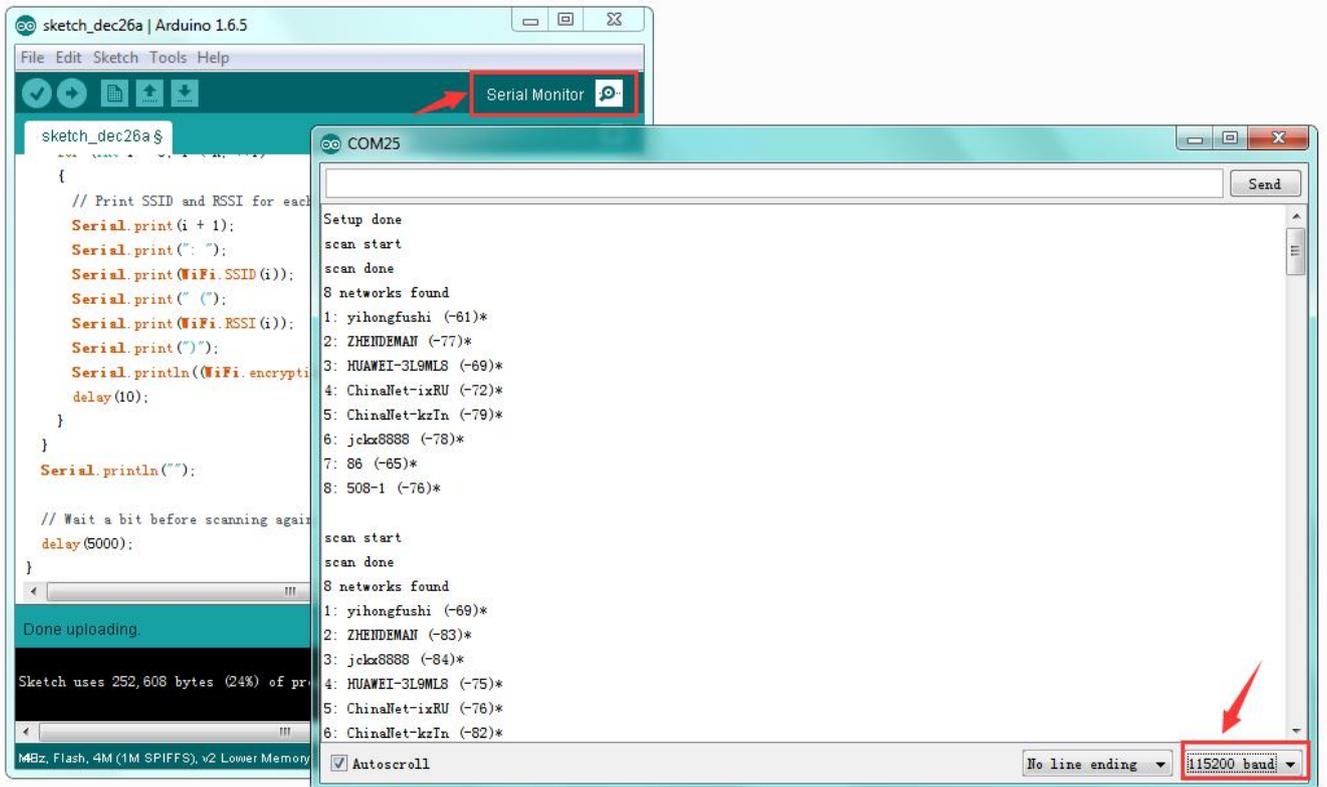






Step7| What Should You See

Done uploading the code, open the serial monitor and set the baud rate to 115200, you should see all the WIFI information.





Package Includes:

- Keyestudio ESP8266 WI-FI module* 1
- USB cable * 1





More Resources:

You can download the PDF file from the link:

<https://drive.google.com/open?id=1Wfgqrcm-TgBC5frC303jiErqVrZ678J8>

Driver Software Download:

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

Download the Libraries:

https://drive.google.com/open?id=1_Y5IKCrDgY3AeovXZKorQ8FVv2oIUOOL

Download the Code:

<https://drive.google.com/open?id=1O1IQF4so7e2buAN3GT9OhJaw7BvE6zvG>

ARDUINO Software:

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