



# Introduction in how to use the Arduino portable version with the Bionic Flower

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This document explains how to install a portable version of the Arduino Software (IDE). This portable version contains all the files and directories necessary to work with the Bionic Flower. Thus, it allows you to start right away with programming the Bionic Flower without any extra library downloads/installations or delays.

## Download

Go to the [Bionics4Education](#) website and download the compressed (.zip) file.

### Curriculum-related and general topics

Bionics Kit (Fish, Elephant, Chameleon): [Student activities](#)

Teambuilding Template: [Teambuilding](#)

Controller Connecting: [Instructions \(EN\)](#)

Controller Trouble Shooting: [Instructions](#)

Reflash Bionics Kit (Fish, Elephant, Chameleon) [flash zip file](#) (**NOTE:** please download this file if you are experiencing issues with the microcontroller. Arduino IDE is not required for this quick update.)

Bionics Kit (Fish, Elephant, Chameleon): Source Code [code zip file](#)

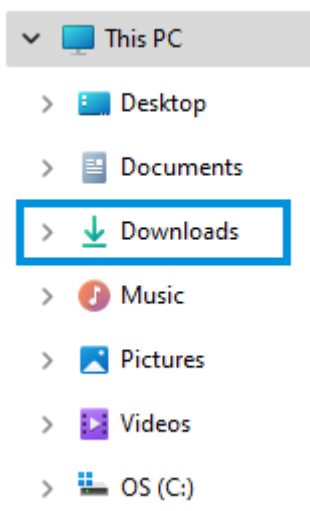
Coding with [Open Roberta](#)

Controller Connecting: [Instructions \(Arabic\)](#)

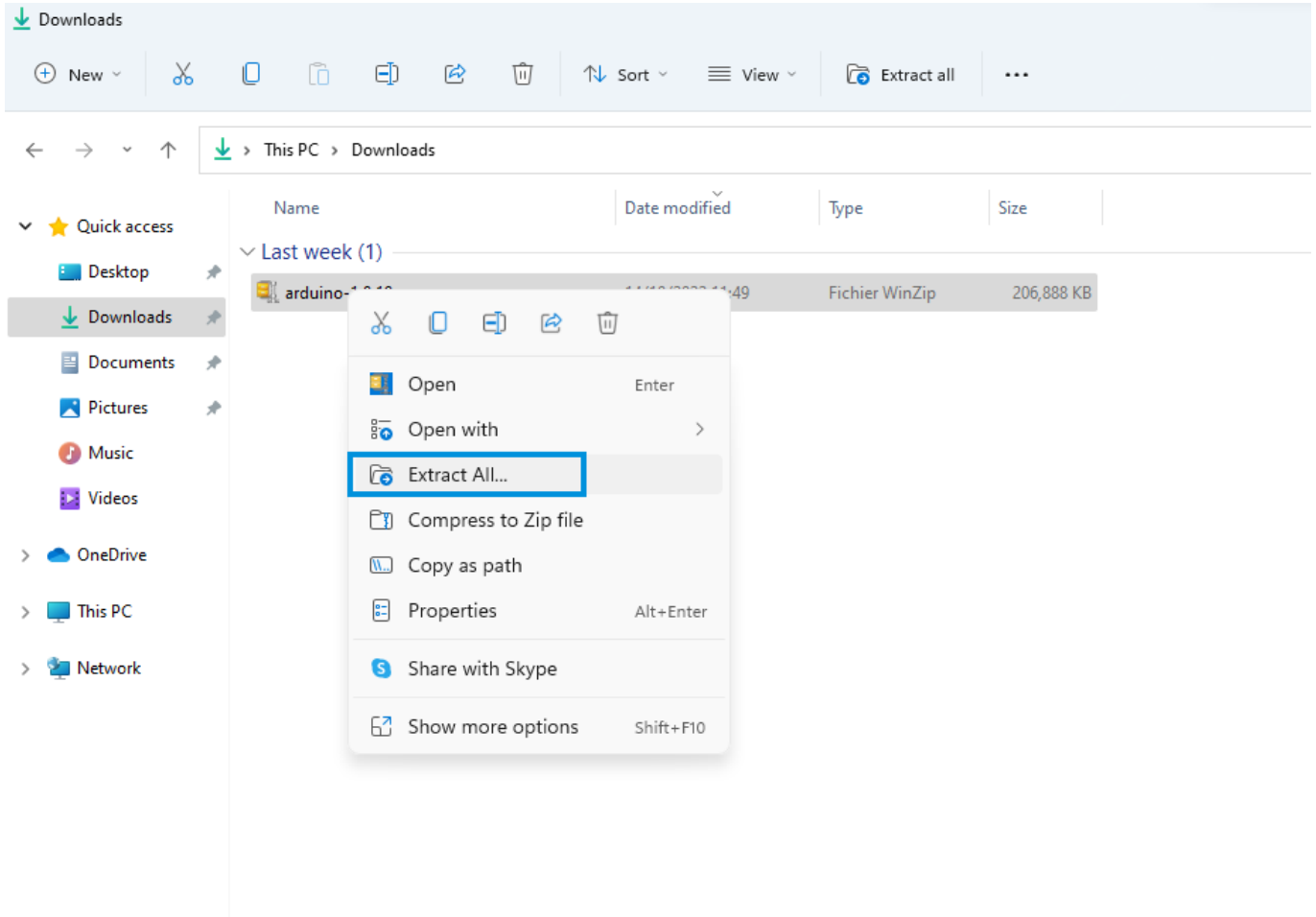
[Program the Bionic Flower with Arduino Portable \(.zip file\). Click here for instructions. You can find more info on GitHub](#)

## Unzip

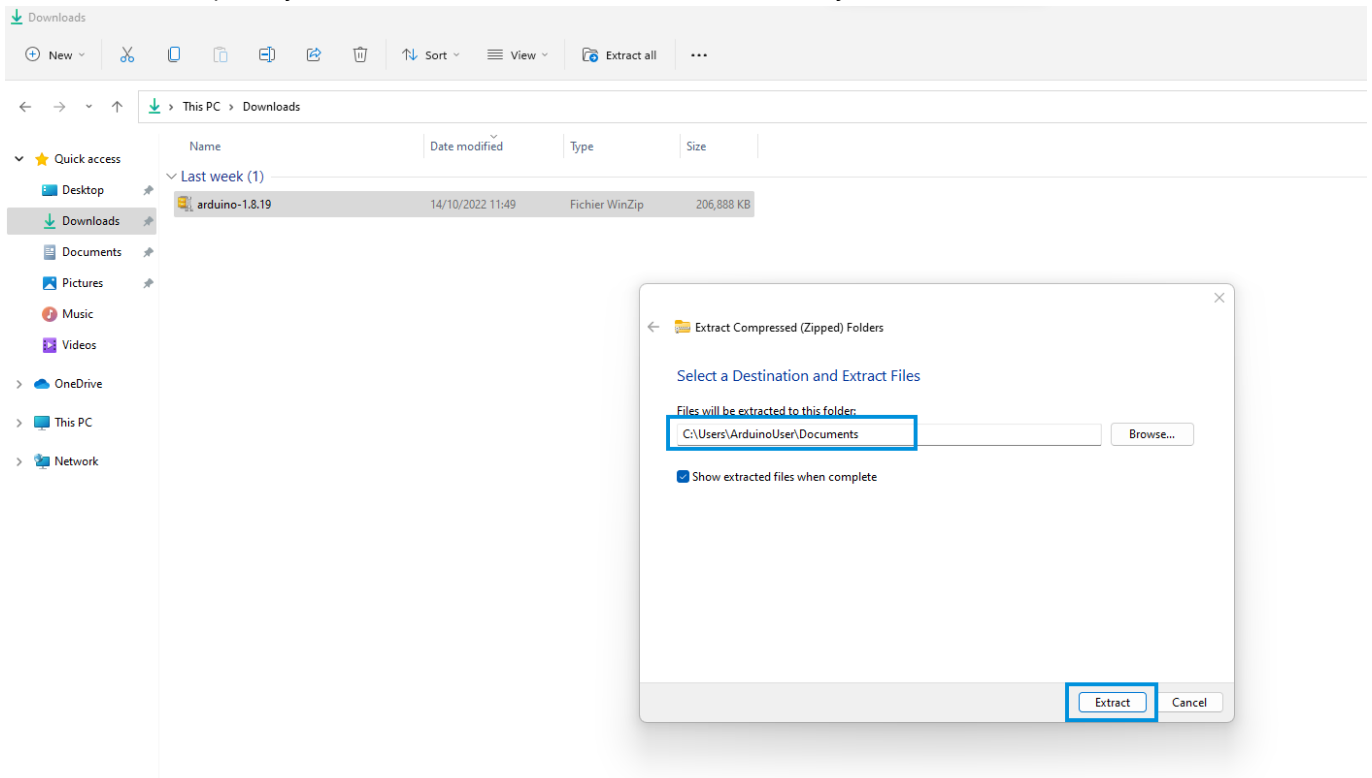
Once the download is completed, you will find the file in zip format in the download folder of your computer.



You need to unzip it to access the file, for that right click on the mouse on the computer and select "Extract All..".

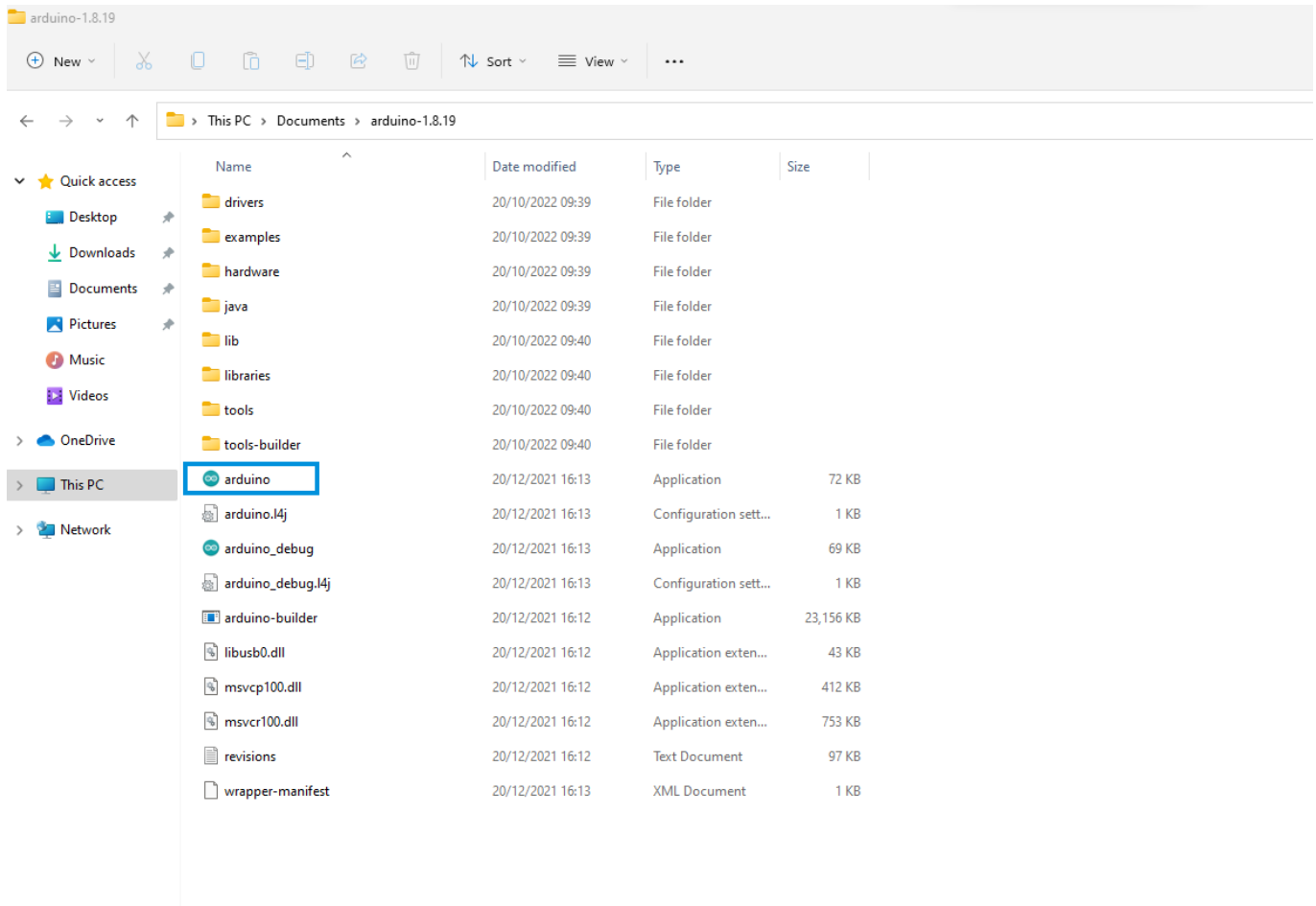


Now a window opens, you can now select the location of the file in your documents and extract.

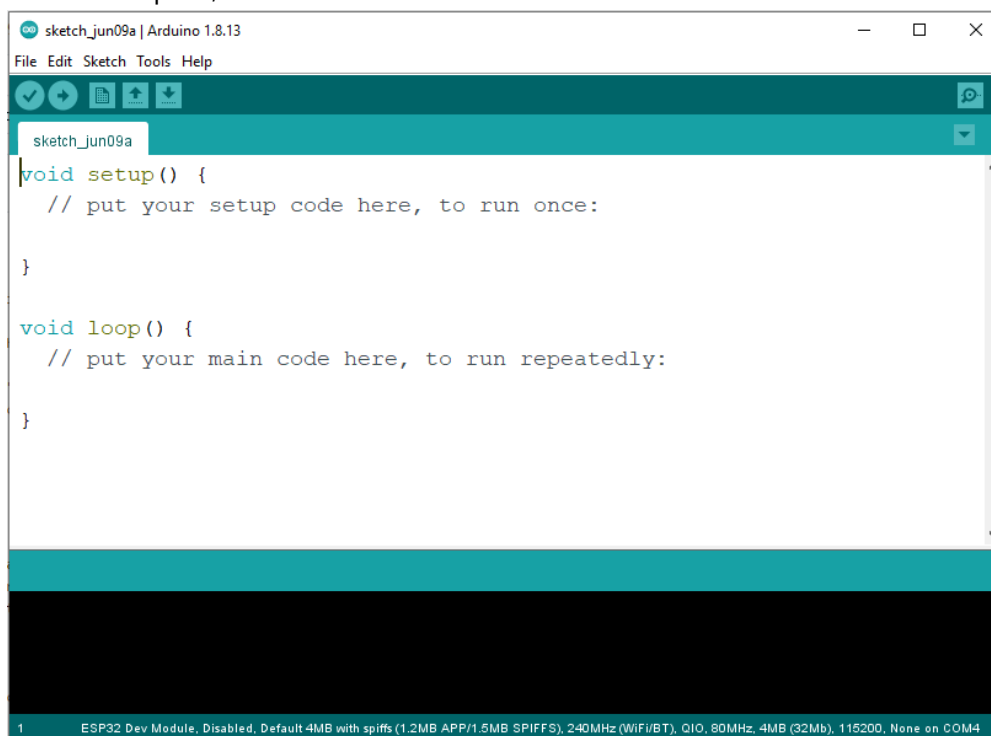


## Start with Arduino IDE

Now that everything is installed, you need to run the Arduino software. Go to the previous folder and execute the arduino.exe file.



A window opens, this is the user interface of the Arduino IDE.

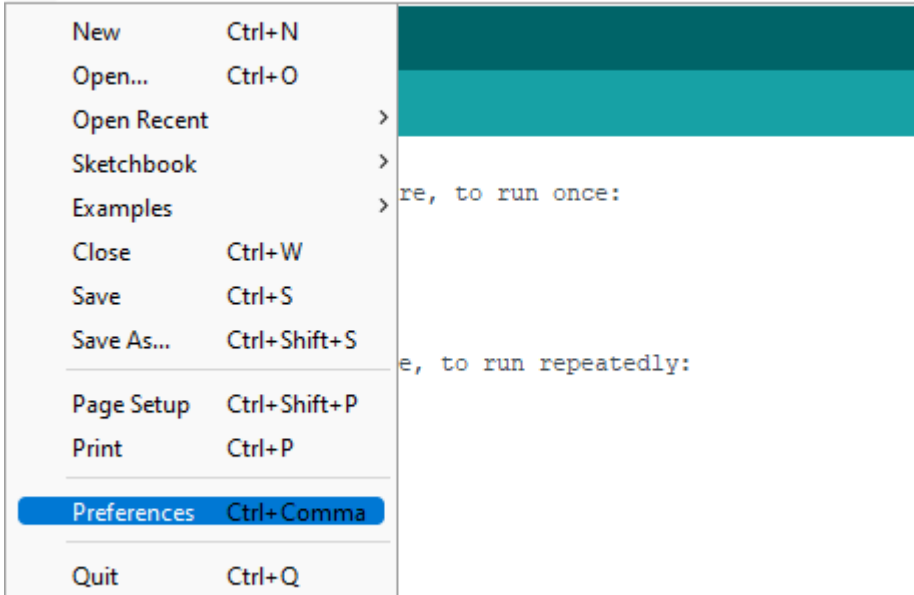


## Setup the Arduino IDE environment for the Bionic Flower

To access all the functionality of the Arduino portable version with your Bionic Flower, you need to setup your ESP32 board. For this go to *File-> Preferences*.

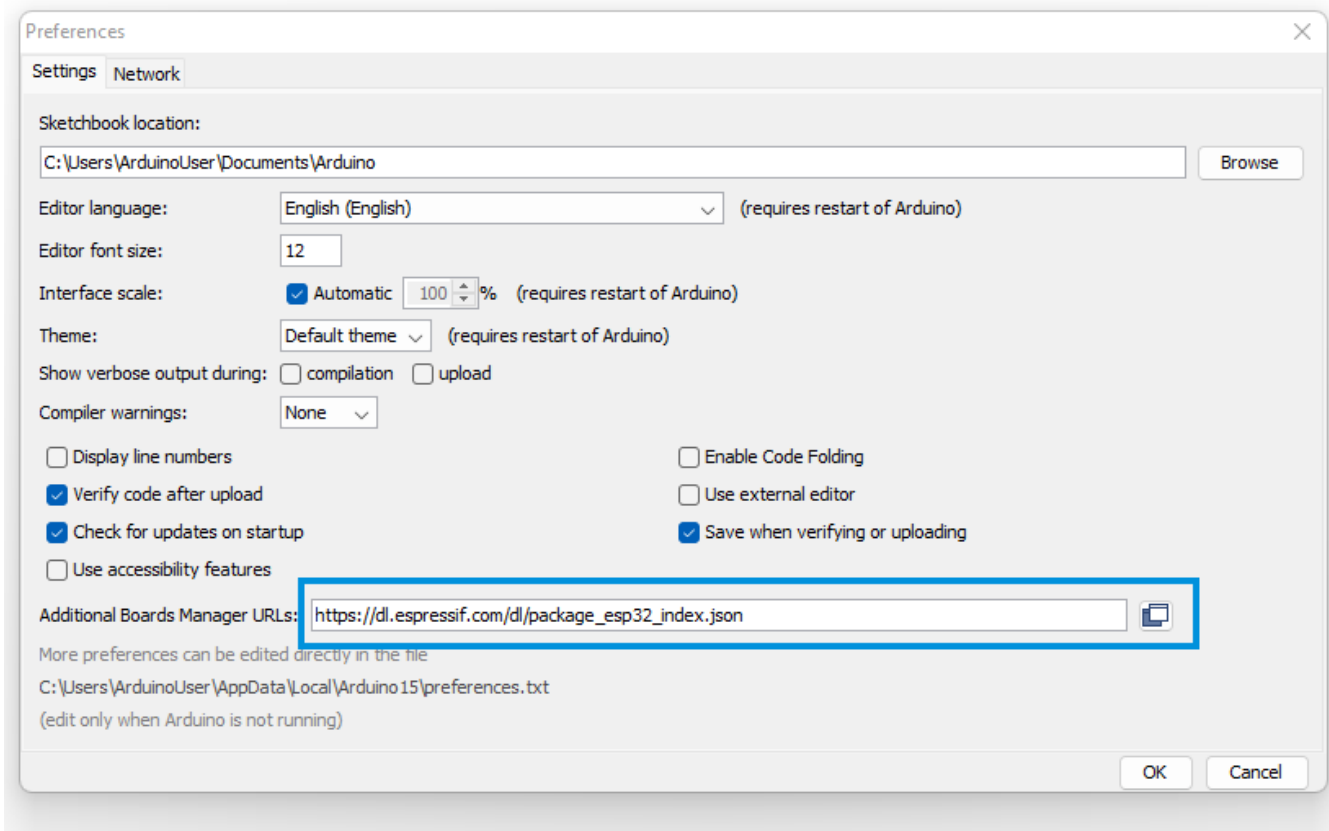
sketch\_oct20a | Arduino 1.8.19

File Edit Sketch Tools Help

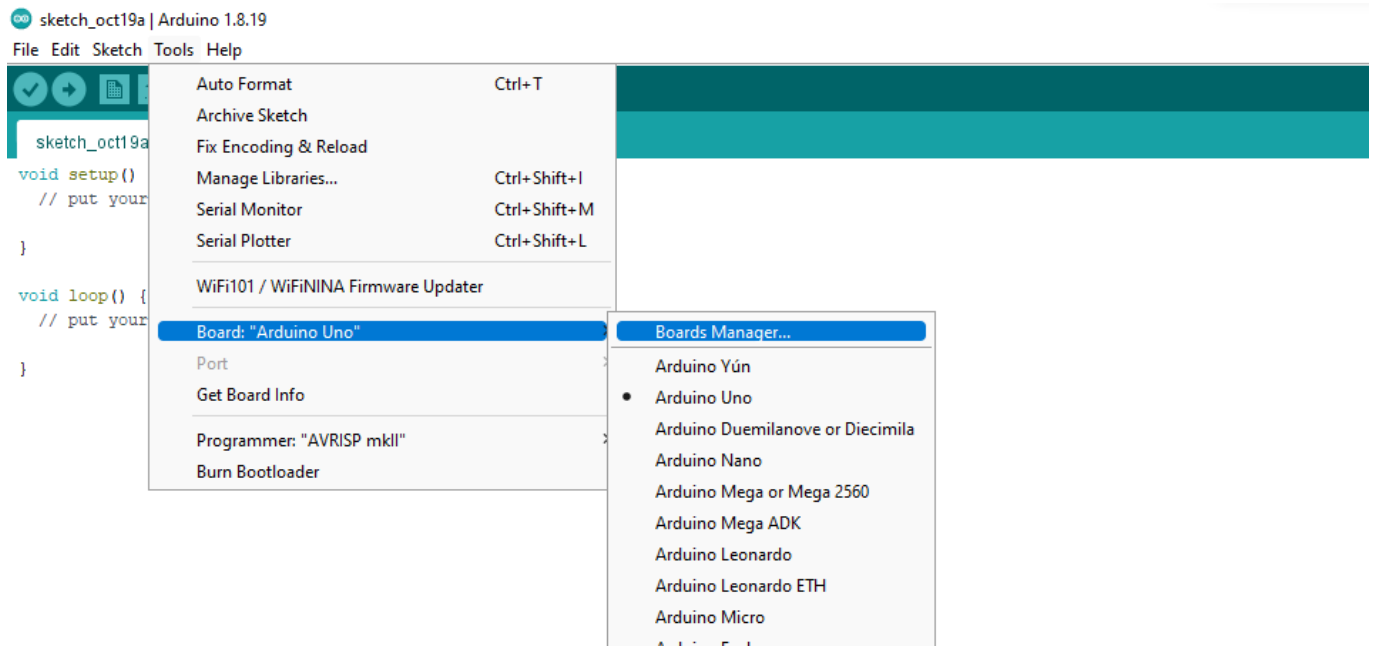


Once opened the preferences window you will check if the URL for the ESP32 board is here. If not, please add in the additional board manager URLs the following link :

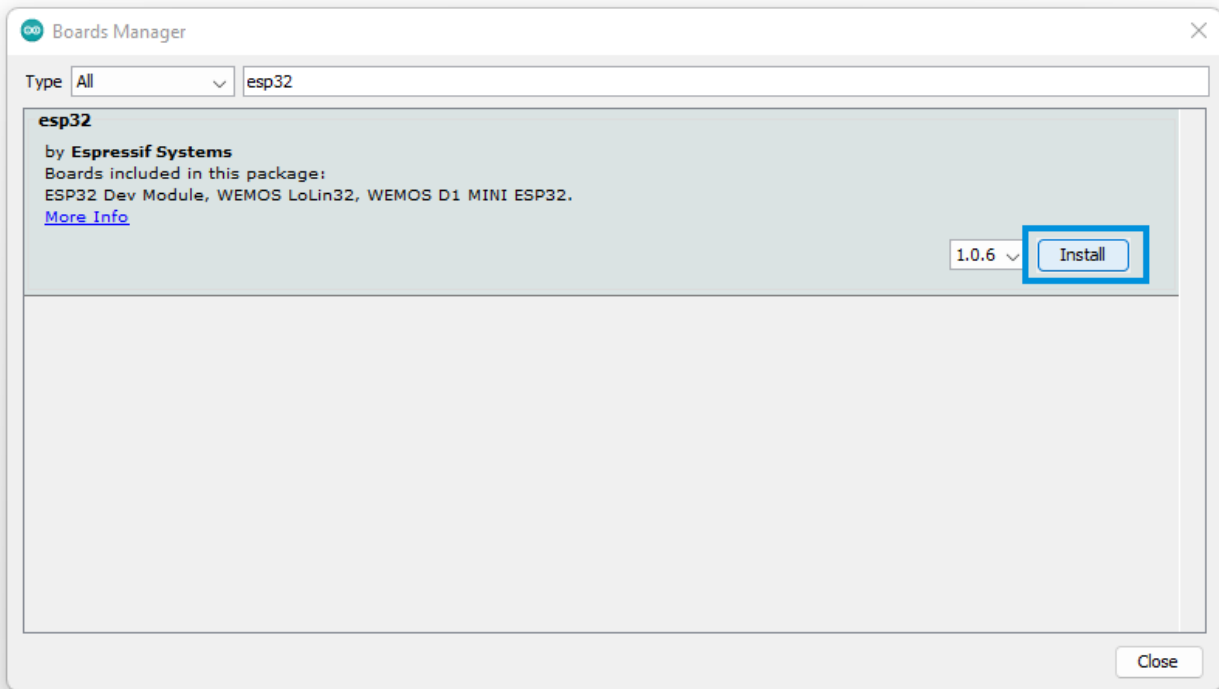
[https://dl.espressif.com/dl/package\\_esp32\\_index.json](https://dl.espressif.com/dl/package_esp32_index.json)



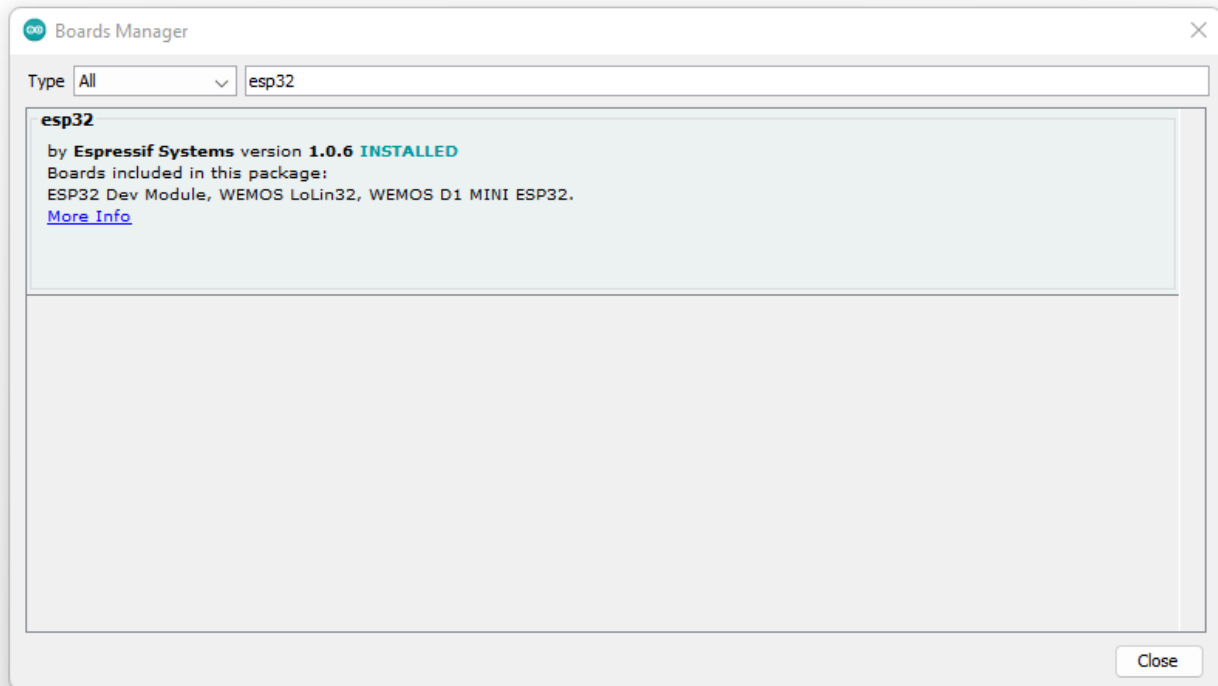
Then, you need to add the library for the ESP32 board. Go to *Tools -> Board -> Board Manager*.



Write *esp32* on the top of the windows wich is opened and click on *Install*.



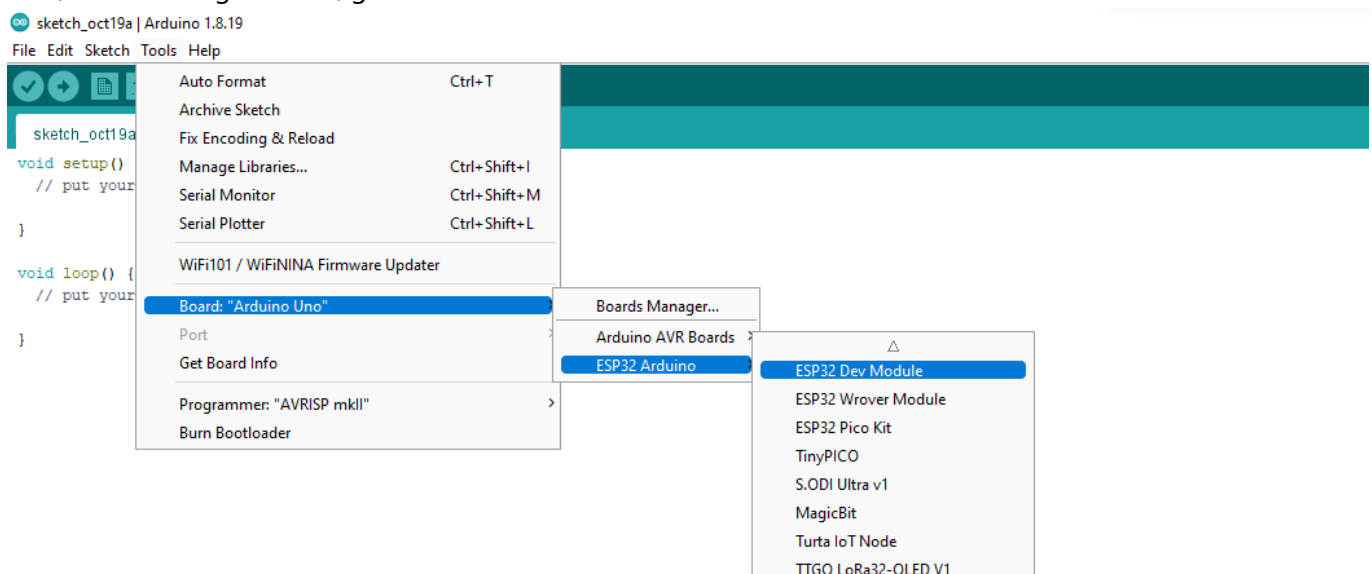
Wait some minutes. The installation is done when the *Installed* indication is displayed. You can close the window.



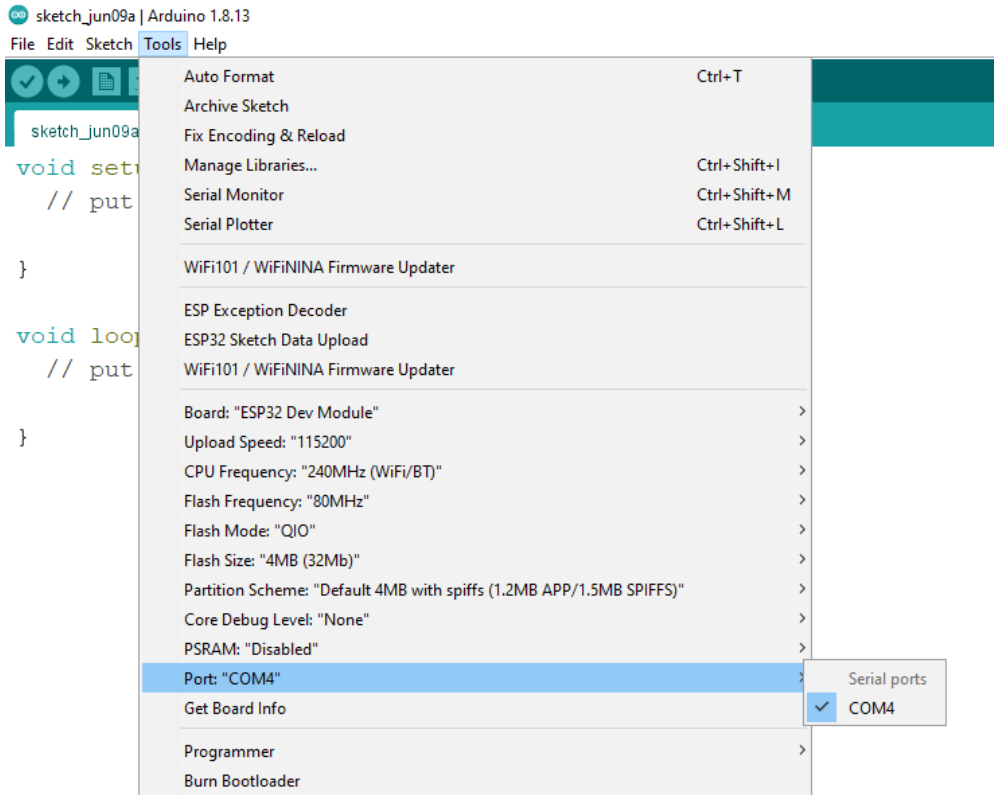
## ESP32 module connection

You have to connect the ESP32 module to your computer via a USB port. If your computer doesn't find the ESP32 module you have to install the driver manually. Therefore go to [SiliconLabs](#), navigate to *Downloads* and download *CP210x Universal Windows Driver*.

First, select the right board, go to *Tools -> Board -> ESP32 Arduino -> ESP32 Dev Module*.



After that, you have to make sure that the right port is selected. For that select *Tools -> Port*.

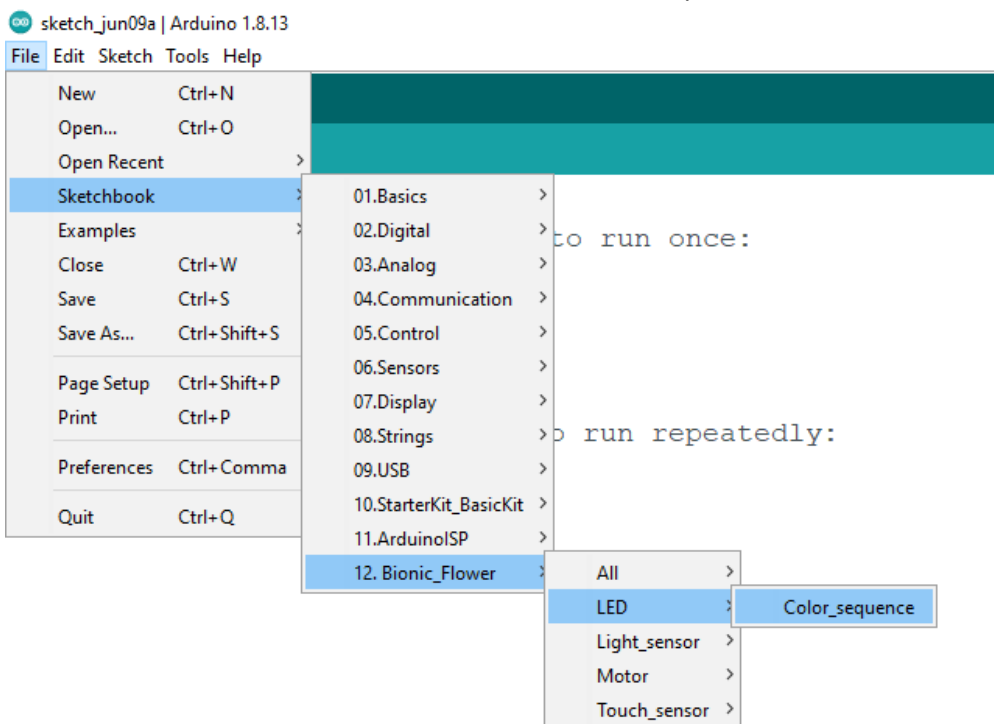


Now, you are ready to start your first code with the Bionic Flower !

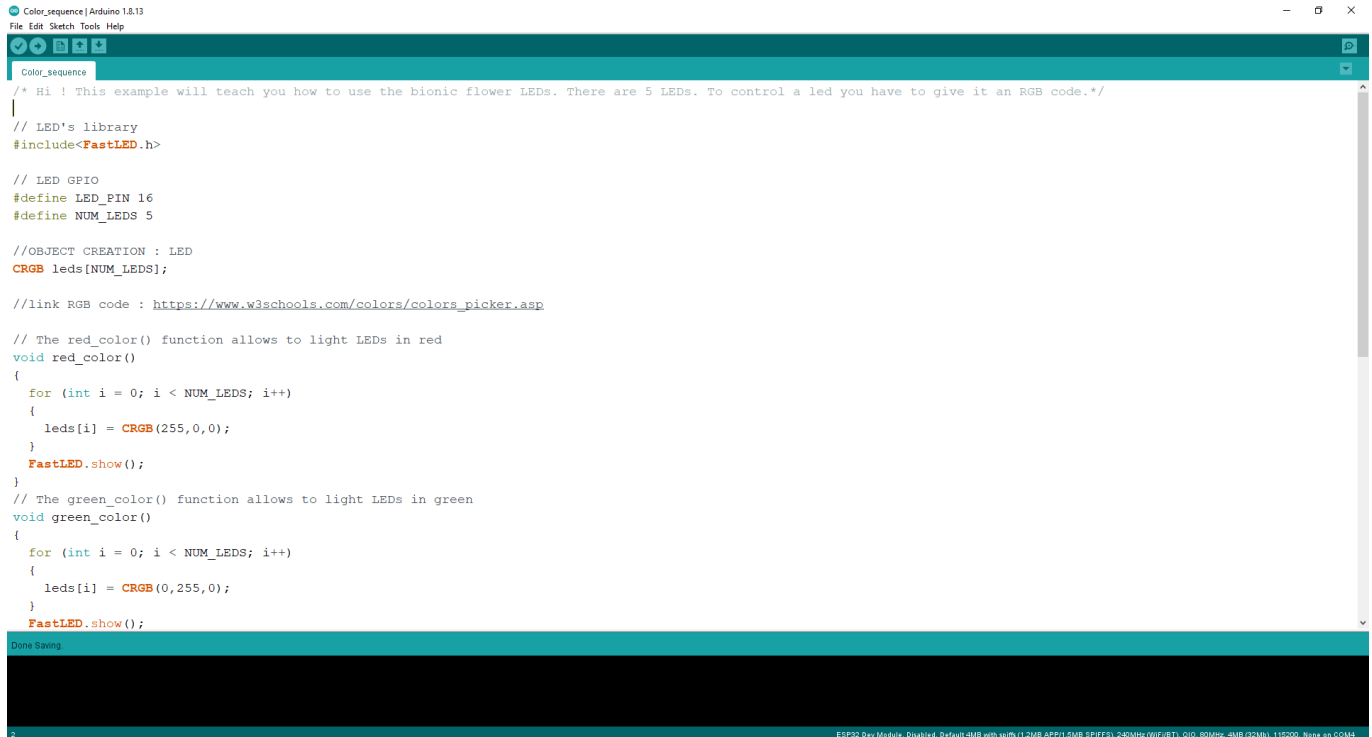
## First test with the Bionic Flower

Some code have been created specifically for you to learn about the Bionic Flower. You can find them by selecting *File -> Sketchbook -> 12.Bionic\_Flower*.

Let's start with the code to work with led LED : *color\_sequence.ino*.



A new window opens with the code for the LED.



```

Color_sequence | Arduino 1.8.19
File Edit Sketch Tools Help

Color_sequence
/* Hi ! This example will teach you how to use the bionic flower LEDs. There are 5 LEDs. To control a led you have to give it an RGB code.*/
|
// LED's library
#include<FastLED.h>

// LED GPIO
#define LED_PIN 16
#define NUM_LEDS 5

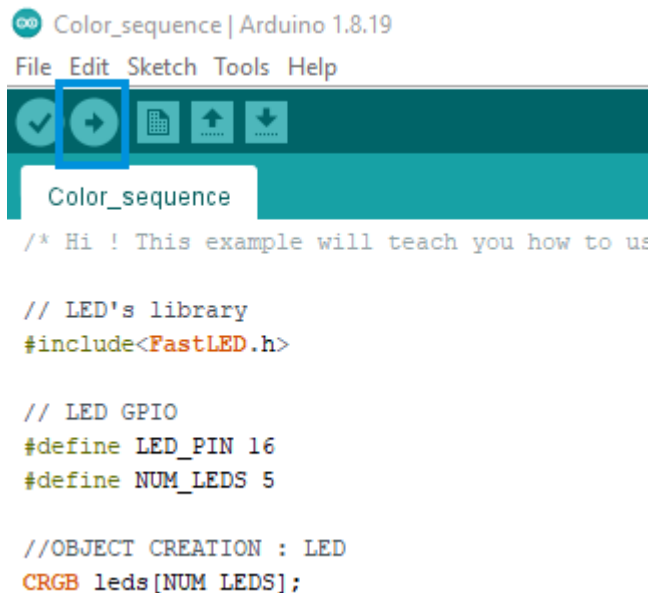
//OBJECT CREATION : LED
CRGB leds[NUM_LEDS];

//link RGB code : https://www.w3schools.com/colors/colors_picker.asp

// The red_color() function allows to light LEDs in red
void red_color()
{
  for (int i = 0; i < NUM_LEDS; i++)
  {
    leds[i] = CRGB(255,0,0);
  }
  FastLED.show();
}
// The green_color() function allows to light LEDs in green
void green_color()
{
  for (int i = 0; i < NUM_LEDS; i++)
  {
    leds[i] = CRGB(0,255,0);
  }
  FastLED.show();
}
Done Saving
ESP32 Dev Module, Disabled, Default, 4MB with SPIFFS (1.2MB APP+1.5MB SPIFFS), 240MHz (WiFi/BT), QIO, 80MHz, 4MB (25M), 115200, None via COM4

```

After reading the code, you can implement the code, i.e. downloaded the code on the ESP32 module. For this you click on right arrow button.



```

Color_sequence | Arduino 1.8.19
File Edit Sketch Tools Help

Color_sequence
/* Hi ! This example will teach you how to use

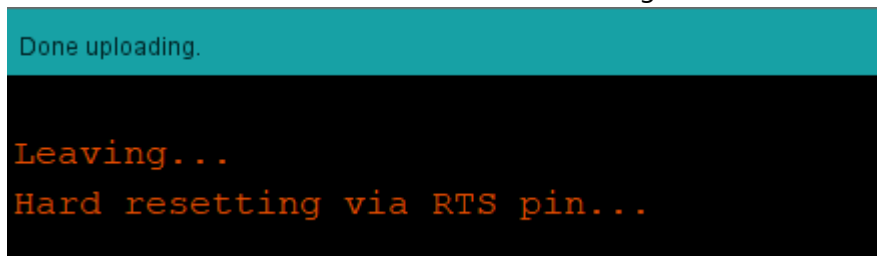
// LED's library
#include<FastLED.h>

// LED GPIO
#define LED_PIN 16
#define NUM_LEDS 5

//OBJECT CREATION : LED
CRGB leds[NUM_LEDS];

```

Make sure the download is finished with this message.



```

Done uploading.
Leaving...
Hard resetting via RTS pin...

```

If everything went well the Bionic Flower changes color !



You can use the same procedure to work with the other sample code of the Bionic Flower.

- **LEDs**

- > *Color\_sequence.ino* : This example teach you how to change the color of the LEDs and create a color sequence (red,blue,green).

- **Motor**

- > *Motor\_Open\_Close.ino* : This example will teach you how to use the Bionic Flower motor. The motor allows to open and close the flower.

- **Touch sensor**

- > *Right\_Left.ino* : This example will teach you how to use the touche sensor and display a message if a touch is detected.

- > *Open\_close\_flower.ino* : This example will teach you how to use the touch sensor to open or close the flower. For this you need to know how use the motor and the touch sensor.

- > *Change\_color.ino* : This example will teach you how to use the touch sennsor to change the color of the flower. For this you need to know how use the LEDs and the touch sensor.

- **Light sensor**

- > *Light\_value.ino* : This example will teach you how to use the light sensor and display the luminosity value on the serial monitor.

- > *Day\_Night\_Color.ino* : This example will teach you how to use light sensor to change the flower's color. If it is the day, the flower lights yellow. If it is the night, the flower lights blue.

- **All components**

- > *Light\_Touch\_LED\_Motor.ino*: This example will teach you how to use 2 sensors with the I2C communication. If a right touch is detected the flower is opening. If a left touch is detected the flower is closing. In addition, if the luminosity is enough the flower is yellow, otherwise the flower is blue.