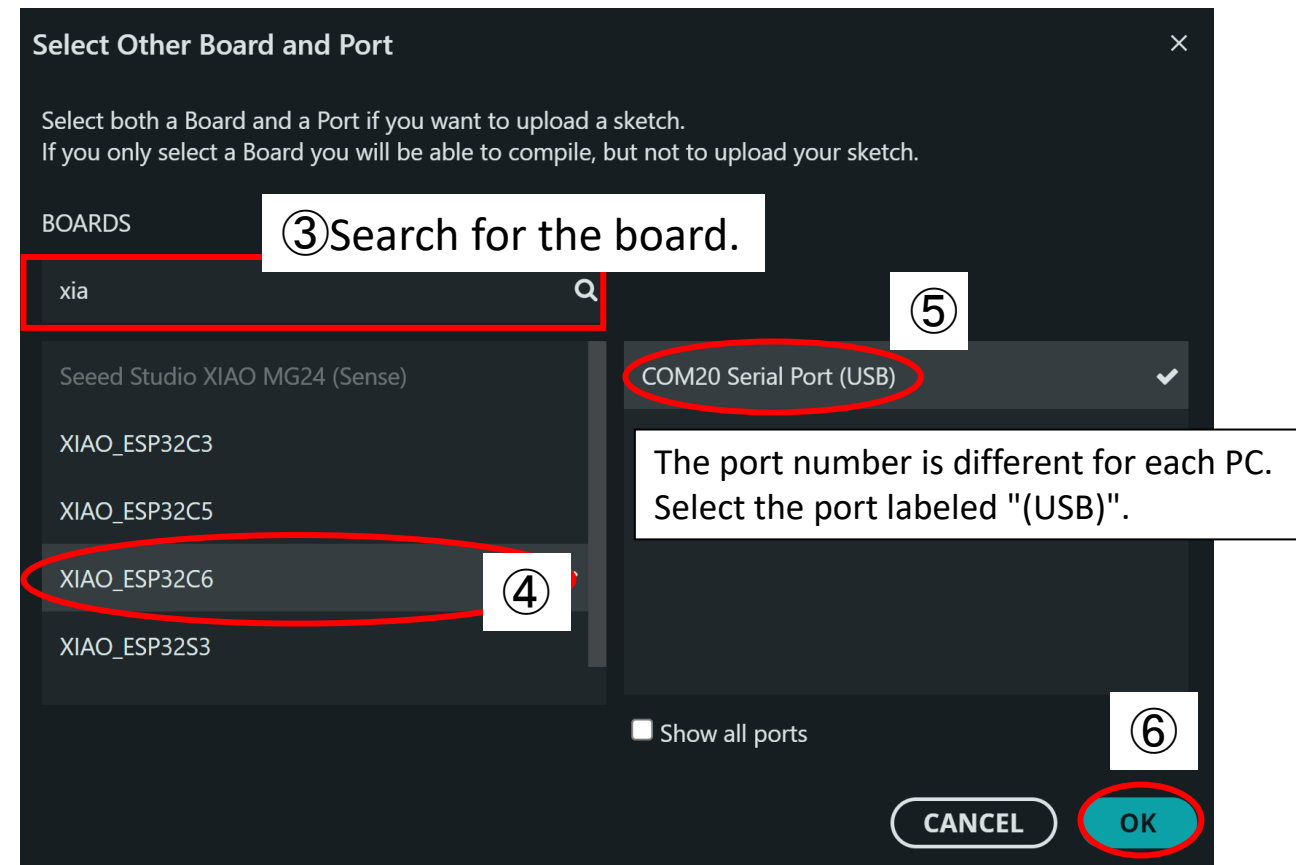
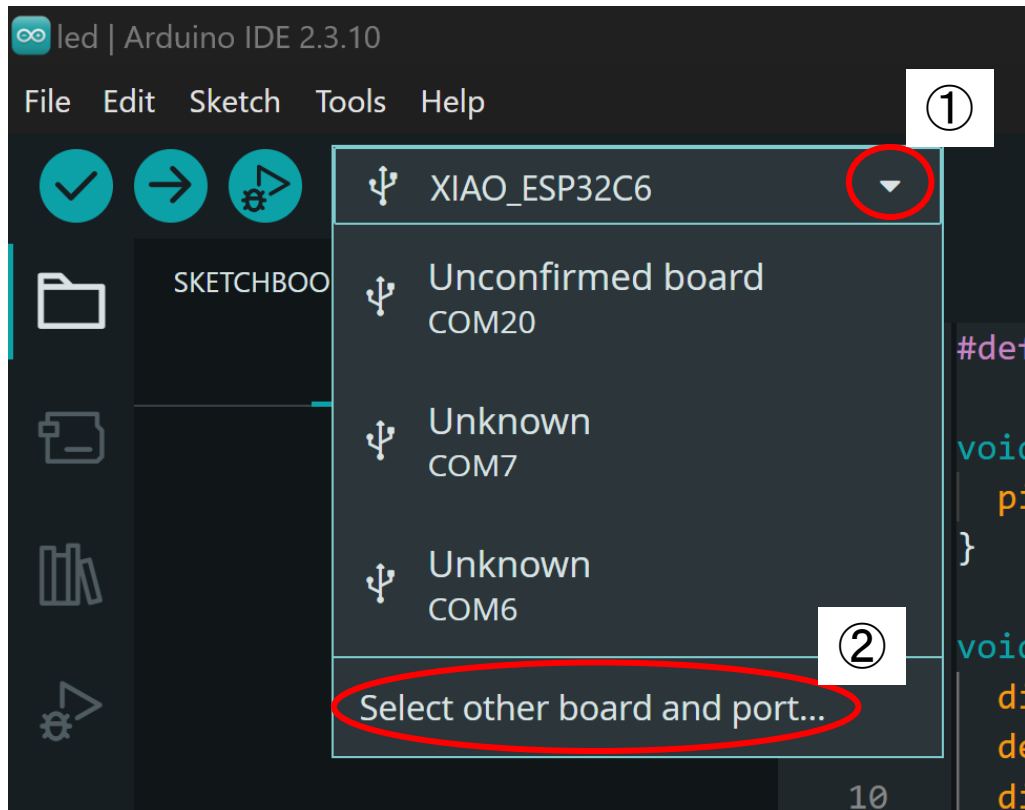


Arduino IDE Installation and ESP32 Setup Guide

Connect the ESP32

- Connect the USB Type-C cable to the PC and the microcontroller.
- Select the "XIAO_ESP32C6" board and the correct port.

Follow the steps below.



Please download the required program.

- Access the link below

<https://www.os.his.u-fukui.ac.jp/abc/>



Welcome to our workshop!

Preparation

1. Install Arduino IDE

Arduino IDE is an integrated development environment for Arduino(MCU).

[Download PDF](#)

You can get required files here!

2. Build circuit

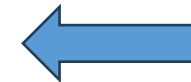
Build a circuit with MCU. Our goal is reading sensor value with ESP32!

[Download PDF](#)

Arduino Code Examples

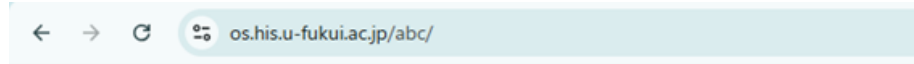
You can get code example here!

1. [Blink built in LED](#)
2. [Toggle LED with push switch](#)
3. [Sound buzzer](#)
4. [Display your name on your OLED display](#)



You should see a site like this.

Please download files



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PowerPoint about how to Arduino IED



PowerPoint about building circuits



Arduino sample code

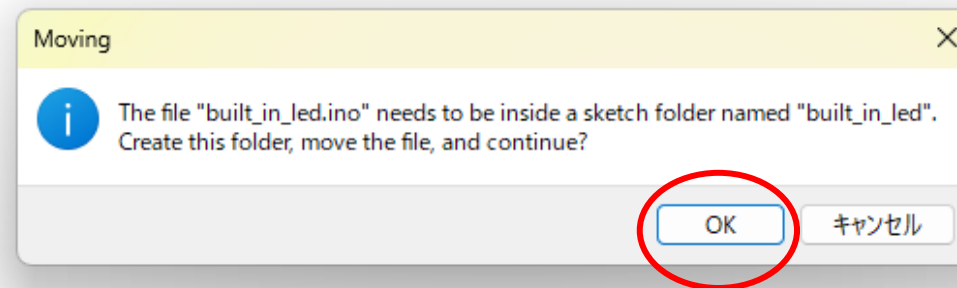
Arduino sample code

- Let's download the 4 files of code.
- When open the file, This warning message appears.

Arduino Code Examples

You can get code example here!

1. [Blink built in LED](#)
2. [Toggle LED with push switch](#)
3. [Sound buzzer](#)
4. [Display your name on your OLED display](#)



 Please click “OK”

Test the Built-in LED on the ESP32

① Compile the program.

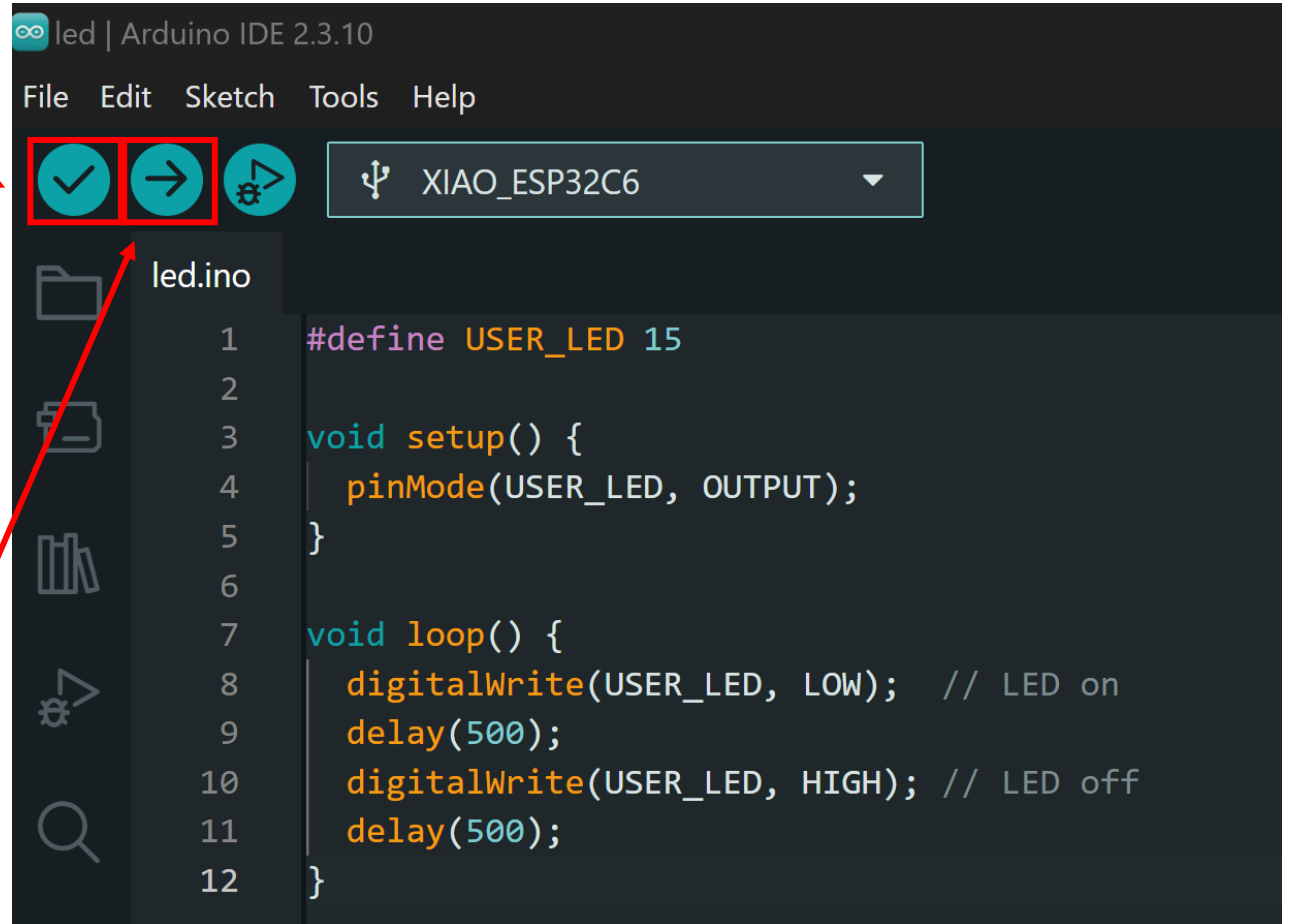


After "Done compiling." is displayed, continue to ②.

② Upload the program.



If the yellow LED on the microcontroller starts blinking, the upload was successful ! .



A circuit where an LED lights up when you press a button

Code name: led_and_switch.ino

```
18 //LED and Switch
19 static bool ledState = false;      // LED state
20 static bool lastSwitchState = HIGH; // Previous LED state
21 bool currentSwitchState = digitalRead(SWITCH1_PIN); //Read the switch pin response
22
23 if (lastSwitchState == HIGH && currentSwitchState == LOW) {
24     ledState = !ledState;          // Invert the LED state (= !)=(≠)
25     digitalWrite(LED_PIN, ledState); // Apply the LED state to the LED pin
26
27     delay(20); // Debouncing
28 }
29 lastSwitchState = currentSwitchState;
```

This code toggles the LED on and off whenever the button is pressed, including a 20ms delay for debouncing.

A circuit where a buzzer sounds when you press a button

Code name: buzzer.ino

```
32     if (digitalRead(SWITCH2_PIN) == LOW) { // if switch is pushed;
33         tone(BZ_PIN,2000);    // tone function
34         delay(100);           //Generate a tone at a specified frequency
35     } else {
36         noTone(BZ_PIN);
37     }
```

This code plays a 2000 Hz tone on the buzzer while the switch is held down and stops it when released.

A circuit with a display

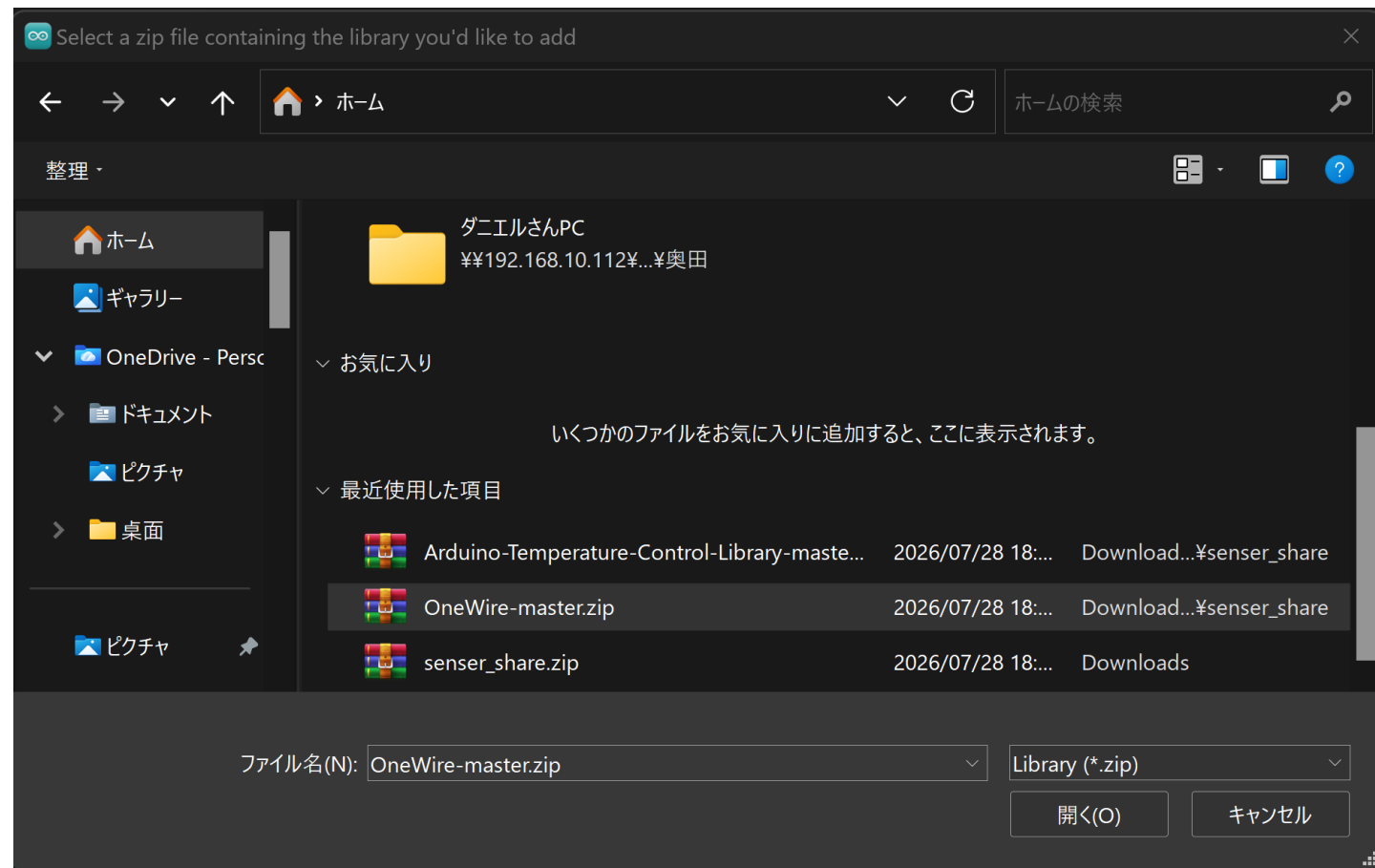
Code name: display.ino

```
27  display.begin(SSD1306_SWITCHCAPVCC, 0x3C);
28  // clean up display
29  display.clearDisplay();
30  // setting text's color and size
31  display.setTextColor(SSD1306_WHITE);
32  display.setTextSize(2); // text's size (1:small, 2:medium, 3:large)
33  //first line
34  display.setCursor(0, 0);
35  display.print("HELLO!");
36  //second line
37  display.setCursor(0, 30);
38  display.print("Myname:"); // write your neme please
39  display.display();
```

- Pin Initialization
- OLED Display Setup
 - Clears any previous screen content (clearDisplay()).
- Text Formatting & Rendering
 - Sets the text color to white and text size to medium (Size 2).
 - Positions the cursor and displays "HELLO!" on the first line and "Myname:" on the second line.

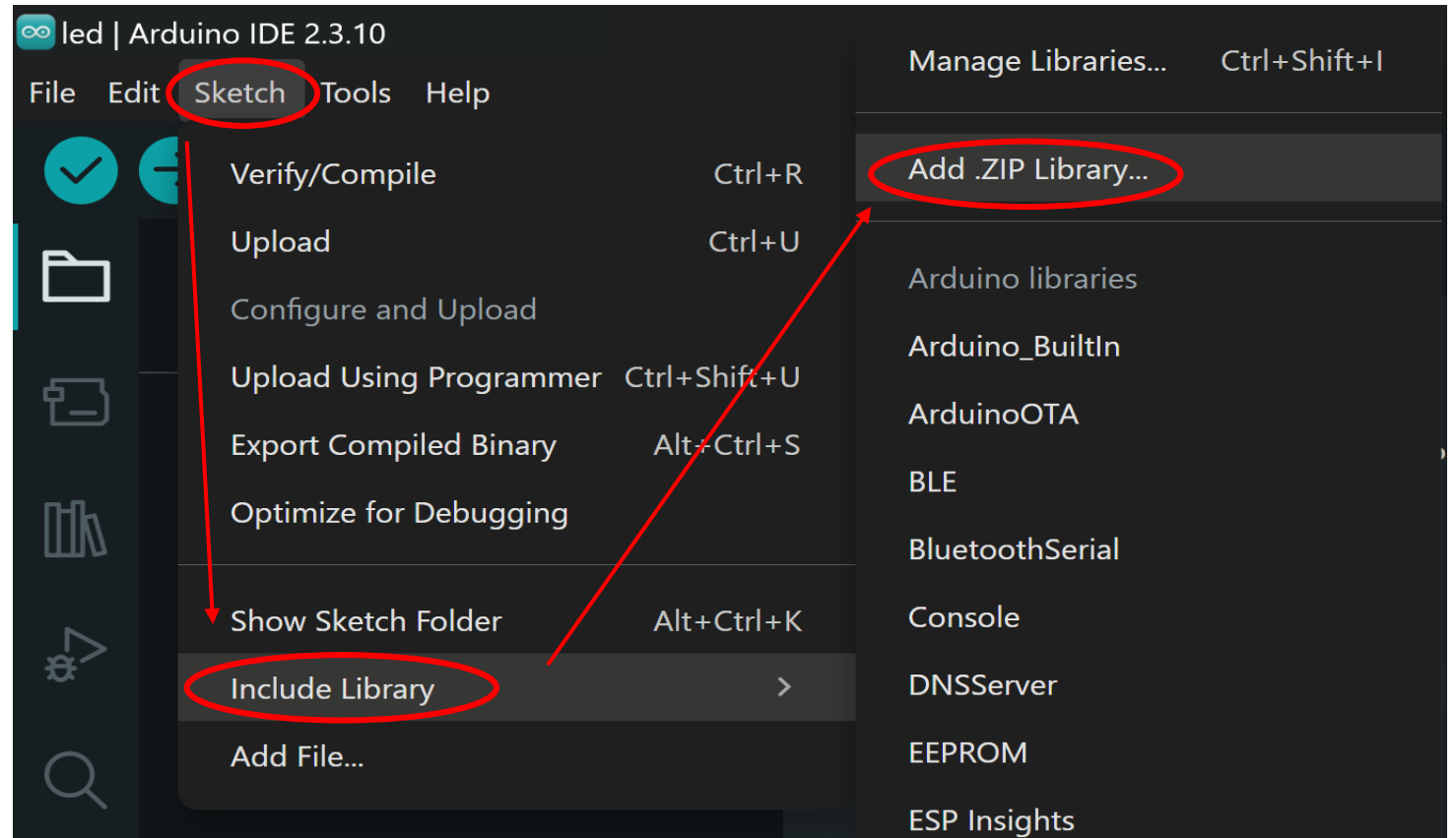
Install the Library (ZIP File)

Install the library required for the temperature sensor.
Download the ZIP file.



Install the Library (ZIP File)

- Sketch>Include Library>Add .ZIP Library...
- Select the downloaded ZIP file.

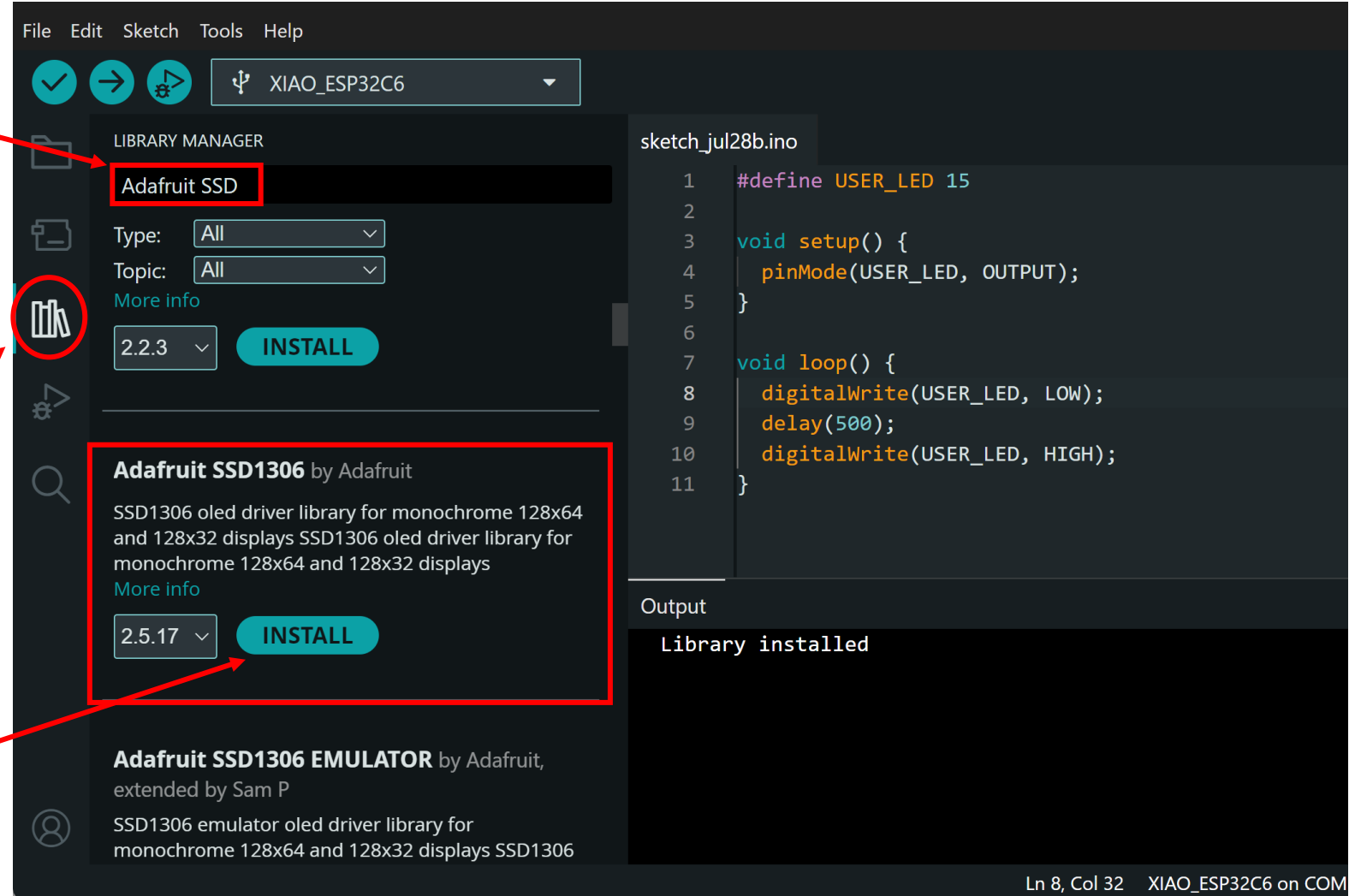


Install the Library

② Search for "Adafruit SSD1306".
Select "1306" (not "1305").

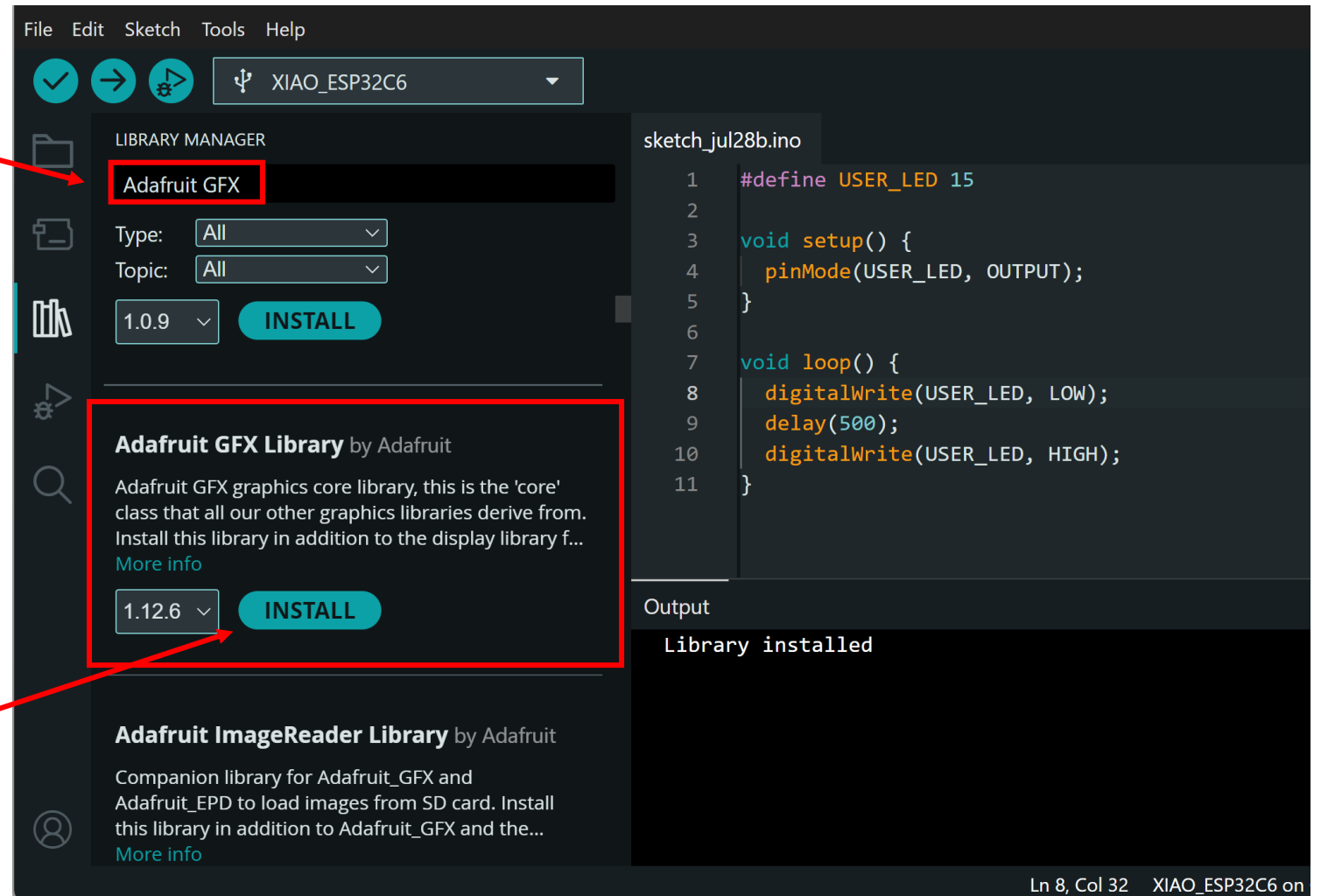
① Open the Library Manager
from the sidebar.

③ Click "Install".



Install the Library

Search for "Adafruit GFX".



Click "Install".

Checking Installed Libraries

Check that all of the following libraries are installed. If a library is already installed, the button will display "REMOVE".

Adafruit BusIO by Adafruit
1.17.4 installed
This is a library for abstracting away UART, I2C and SPI interfacing This is a library for abstracting away UART...
[More info](#)
1.17.4 ▾ REMOVE

Adafruit GFX Library by Adafruit
1.12.6 installed
Adafruit GFX graphics core library, this is the 'core' class that all our other graphics libraries derive fro...
[More info](#)
1.12.6 ▾ REMOVE

Adafruit SSD1306 by Adafruit
2.5.17 installed
SSD1306 oled driver library for monochrome 128x64 and 128x32 displays SSD1306 oled driver librar...
[More info](#)
2.5.17 ▾ REMOVE

DallasTemperature by Miles Burton...
4.0.6 installed
Arduino library for Dallas/Maxim temperature ICs Support for DS18B20 and other Dallas/Maxim ...
[More info](#)
4.0.6 ▾ REMOVE

OneWire by Jim Studt, Tom Pollard, Robin James, Glenn...
2.3.8 installed
Access 1-wire temperature sensors, memory and other chips.
[More info](#)
2.3.8 ▾ REMOVE