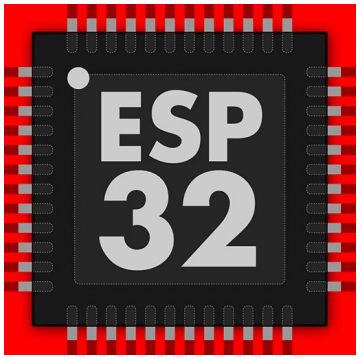
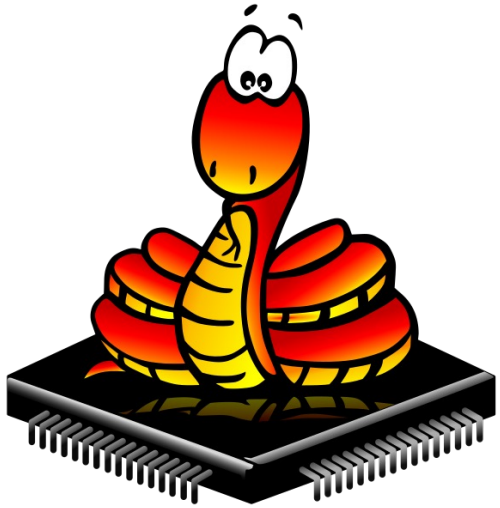
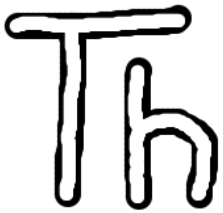
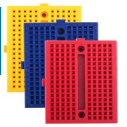




Module 1. MicroPython Basic

safyzan salim
019 622 0575





Theoretically:

√ To run Python code on an ESP32 microcontroller, you need to flash ESP32's MicroPython firmware.

√ MicroPyton ports Python 3.x, designed to run on microcontrollers, small embedded systems and is tailored for resource-constrained environments like the ESP32.

√ Link to download ESP32's MicroPython firmware:
https://micropython.org/download/ESP32_GENERIC/

√ Python IDE: Thonny IDE
https://thonny.org/

Listed are Arduino families that can be used for MicroPython:

Arduino Nano 33 BLE Sense
Arduino

Arduino Giga
Arduino

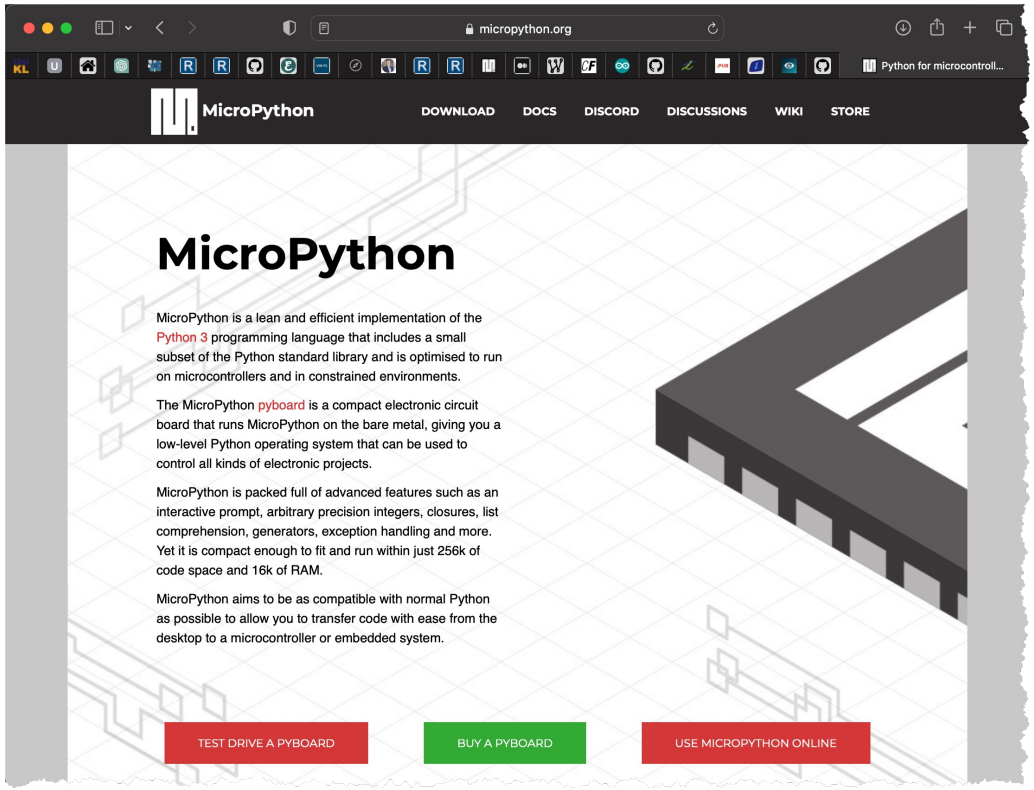
Arduino Nano ESP32
Arduino

ESP32 / WROOM
Espressif

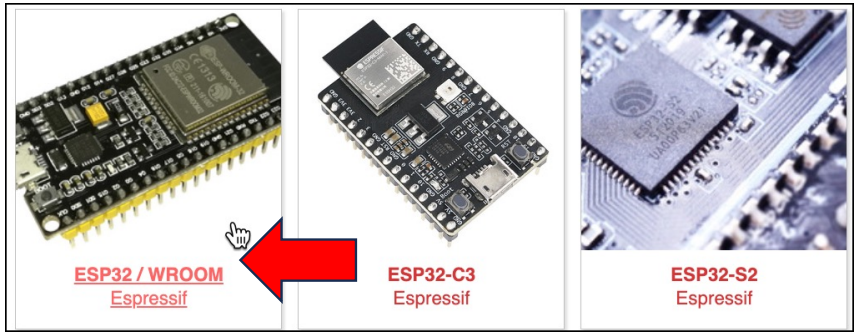
ESP8266
Espressif

>> Do refer at this link for further details:
https://micropython.org/download/

1. Downloading MicroPython Firmware.



- Download from https://micropython.org/download
- Select the appropriate board.



1. Downloading MicroPython Firmware.

Firmware

Releases

v1.20.0 (2023-04-26) .bin [.elf] [.map] [Release notes] (latest)
v1.19.1 (2022-06-18) .bin [.elf] [.map] [Release notes]
v1.18 (2022-01-17) .bin [.elf] [.map] [Release notes]
v1.17 (2021-09-02) .bin [.elf] [.map] [Release notes]
v1.16 (2021-06-23) .bin [.elf] [.map] [Release notes]
v1.15 (2021-04-18) .bin [.elf] [.map] [Release notes]
v1.14 (2021-02-02) .bin [.elf] [.map] [Release notes]
v1.13 (2020-09-02) .bin [.elf] [.map] [Release notes]
v1.12 (2019-12-20) .bin [.elf] [.map] [Release notes]

Nightly builds

v1.20.0-448-g5e5059373 (2023-09-05) .bin [.app-bin] [.elf] [.map]
v1.20.0-445-g8bd2494c9 (2023-09-04) .bin [.app-bin] [.elf] [.map]
v1.20.0-442-gd00105494 (2023-09-04) .bin [.app-bin] [.elf] [.map]
v1.20.0-441-gbf35eefc6 (2023-09-04) .bin [.app-bin] [.elf] [.map]

Firmware (ESP32 Unicore)

Releases

v1.20.0 (2023-04-26) .bin [.elf] [.map] [Release notes] (latest)

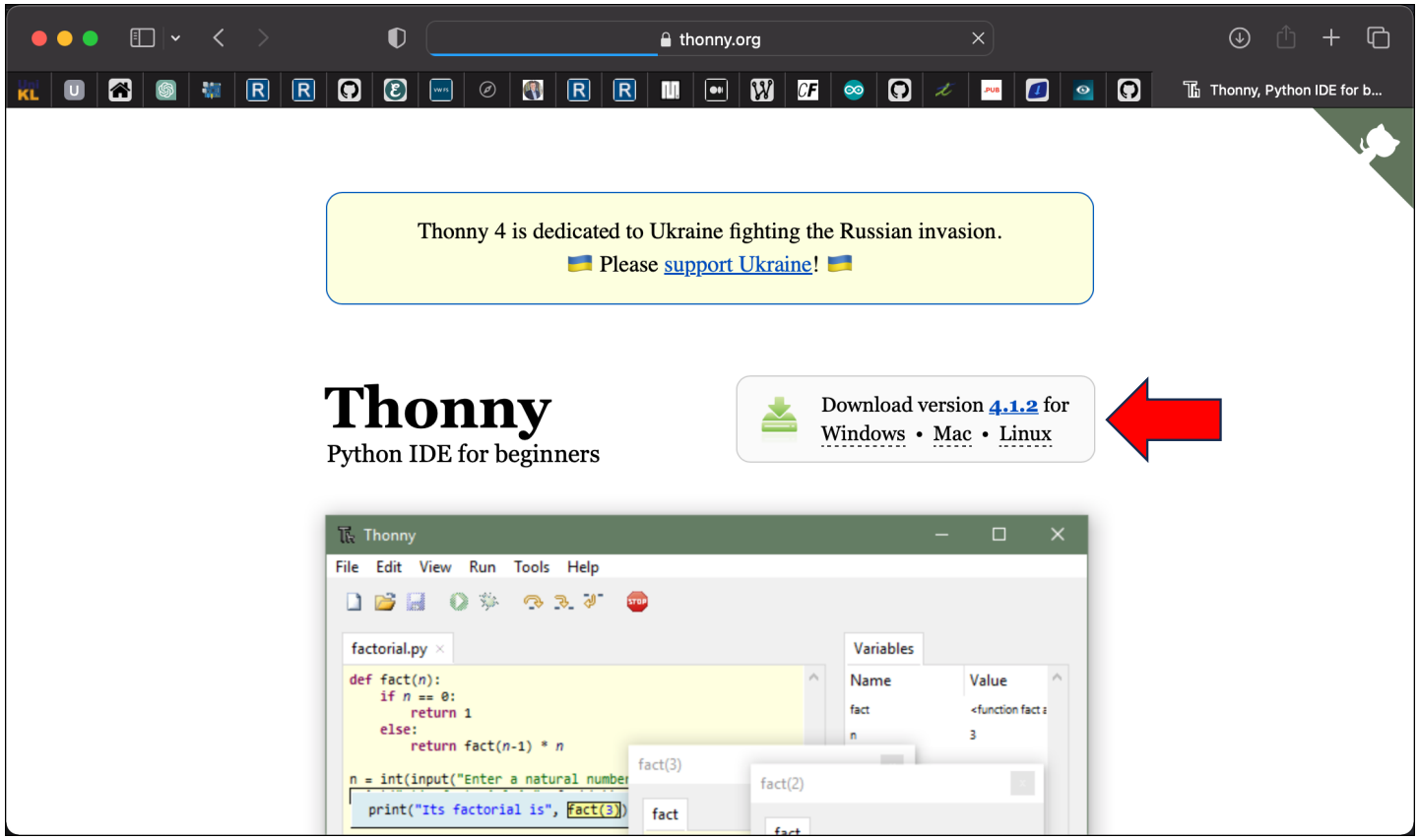
Nightly builds

v1.20.0-448-g5e5059373 (2023-09-05) .bin [.app-bin] [.elf] [.map]
v1.20.0-445-g8bd2494c9 (2023-09-04) .bin [.app-bin] [.elf] [.map]
v1.20.0-442-gd00105494 (2023-09-04) .bin [.app-bin] [.elf] [.map]
v1.20.0-441-gbf35eefc6 (2023-09-04) .bin [.app-bin] [.elf] [.map]

ESP32 / WROOM
Espressif

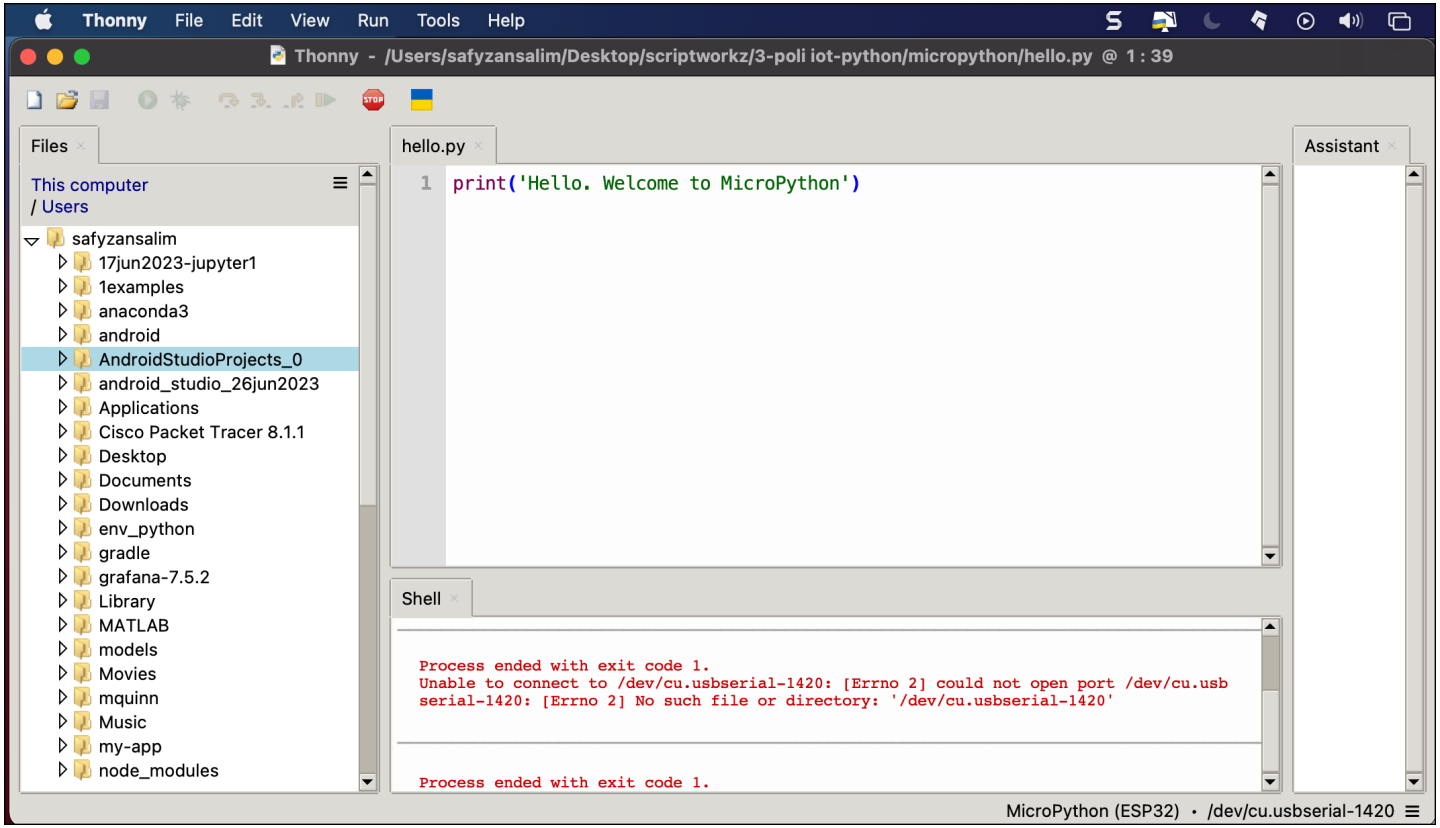
- Choose any dot bin version **releases** firmware.**e.g.: v1.19.1(2022-06-18).bin**
- Nightly builds are unstable with fresh features and bugs not thoroughly tested.
- Normally, select **one** or **two** version lower from the recent version.

2. Thonny Python IDE: Download & Install

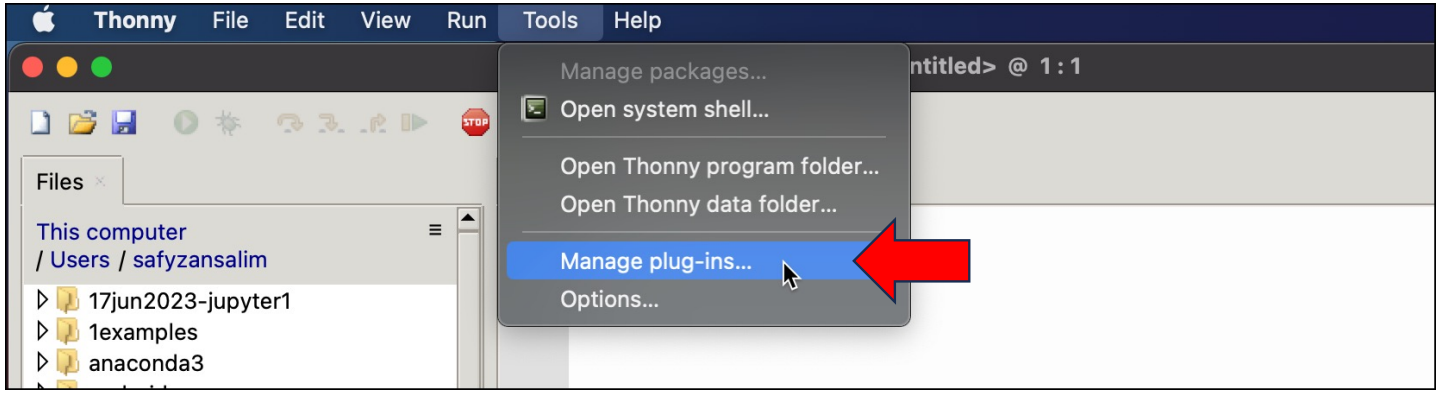


- Download from https://thonny.org/
- Thonny is a beginner friendly Python IDE.
- To erase & flush new firmware to ESP32S with the help of ESP tool.
- Act as Python editor.

2. Thonny Python IDE: Run Thonny

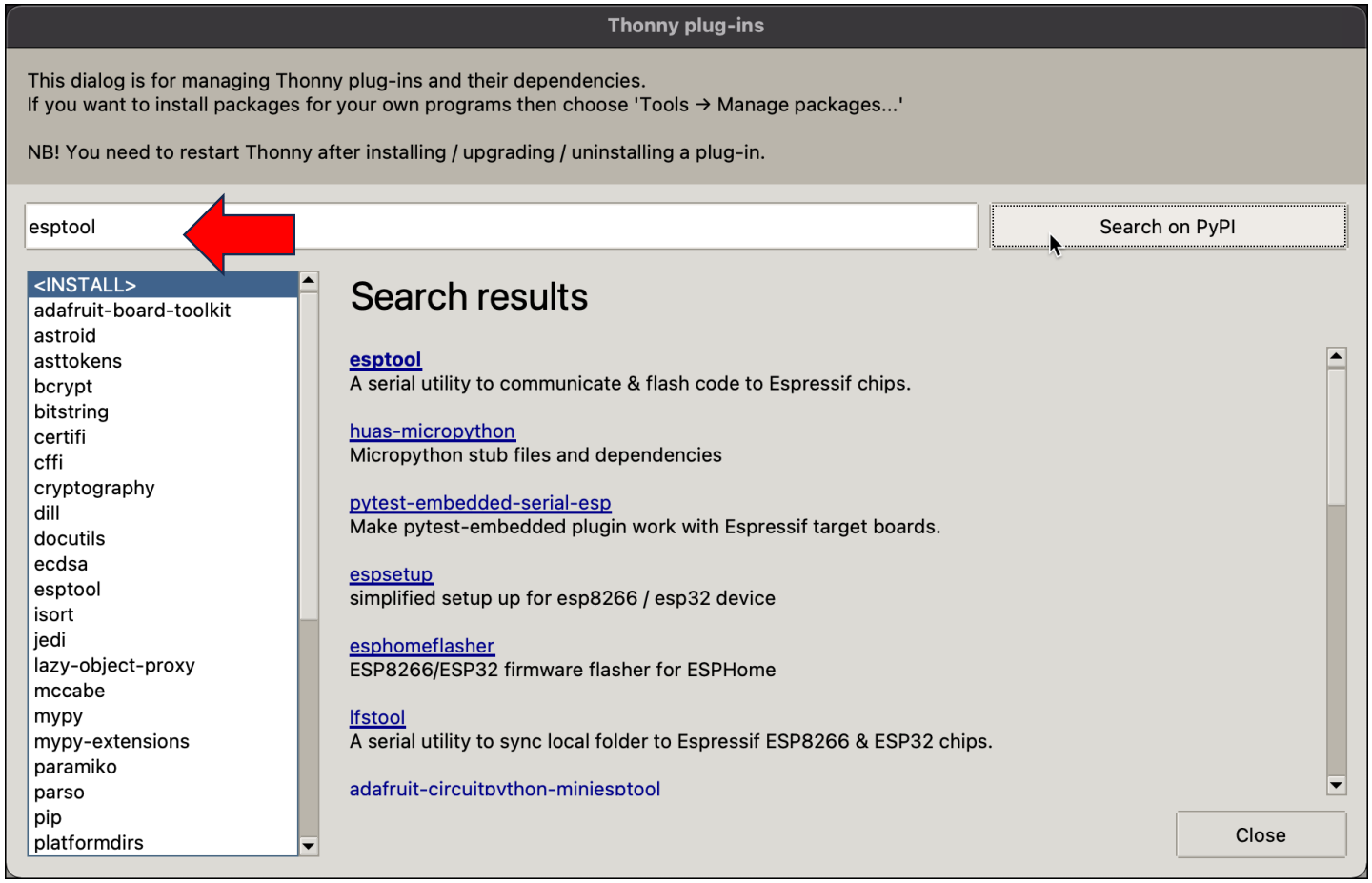


2. Thonny Python IDE: Flushing New ESP32 Firmware.

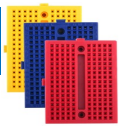


- Install plug-ins first.
- **Tools > Manage plug-ins.**
- **Connect the ESP32S to your system.**

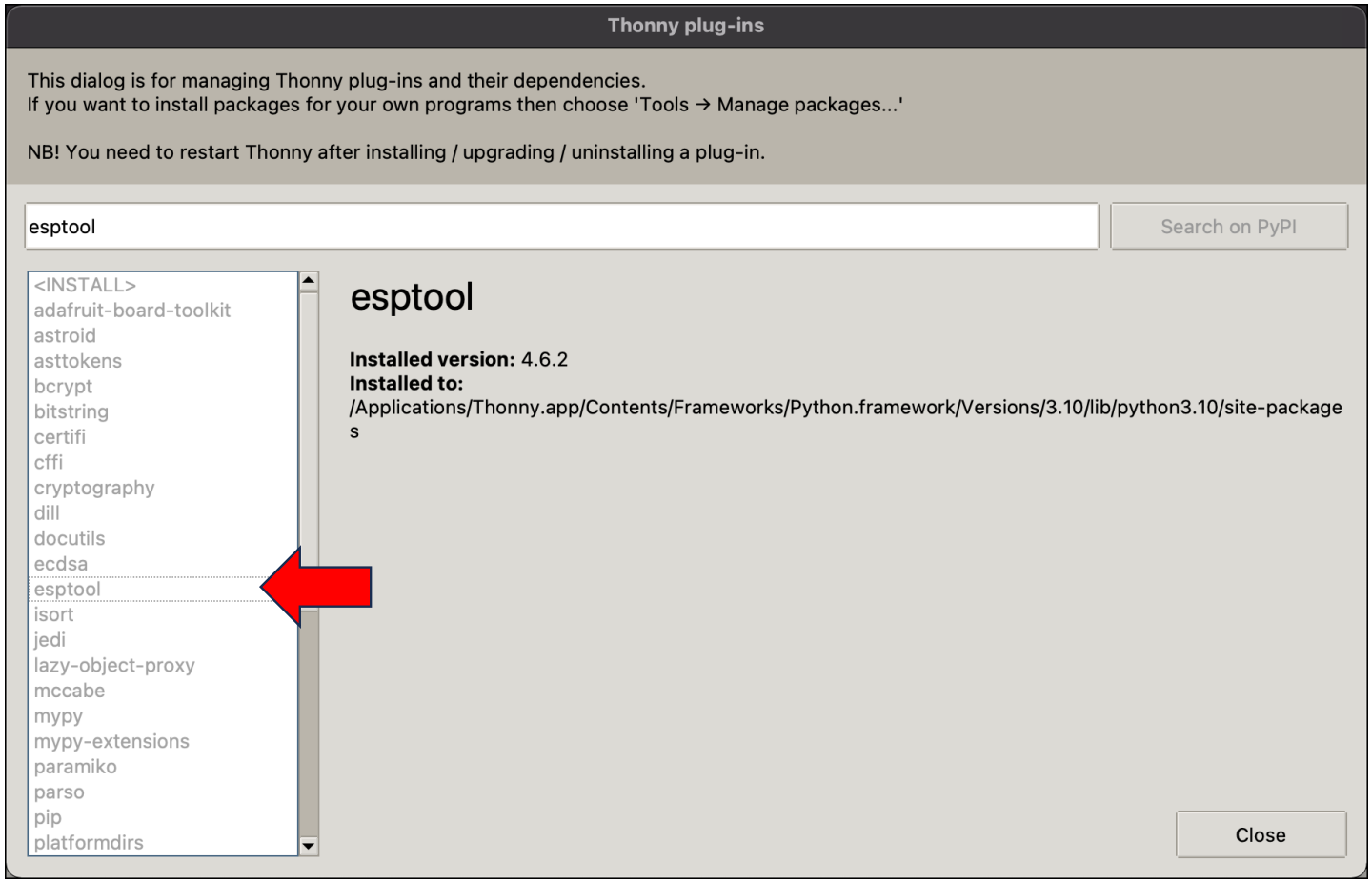
2. Thonny Python IDE: Flushing New ESP32 Firmware.



- Type **esptool** & click Search on PyPi button.
- Click **esptool** to install.

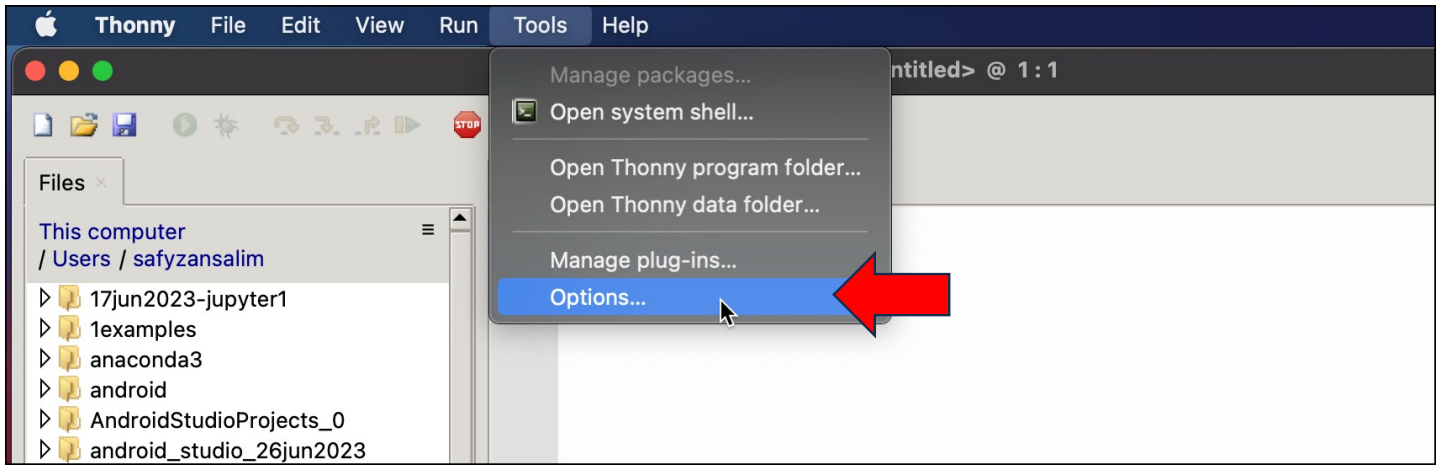


2. Thonny Python IDE: Flushing New ESP32 Firmware.



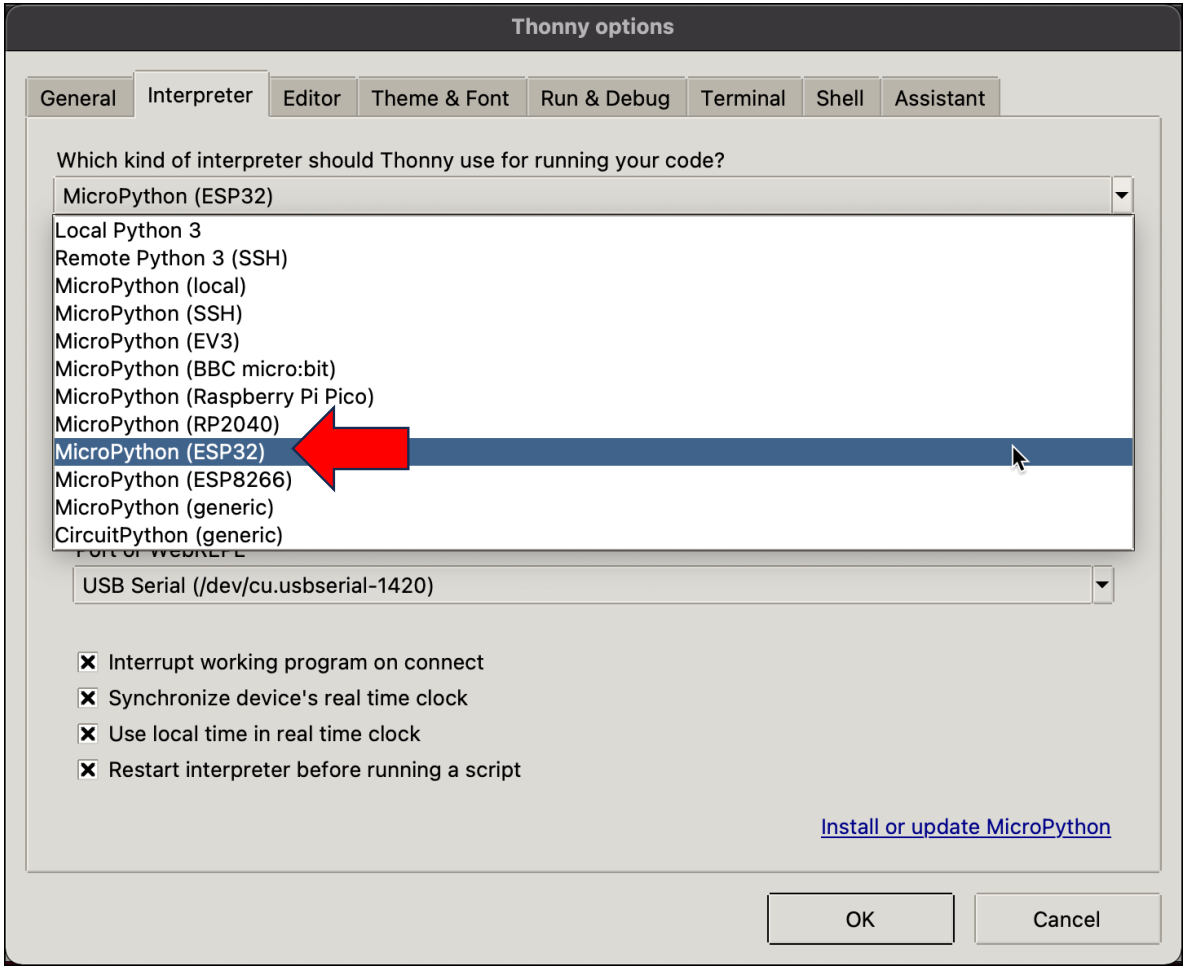
- **esptool** installed.

2. Thonny Python IDE: Flushing New ESP32 Firmware.



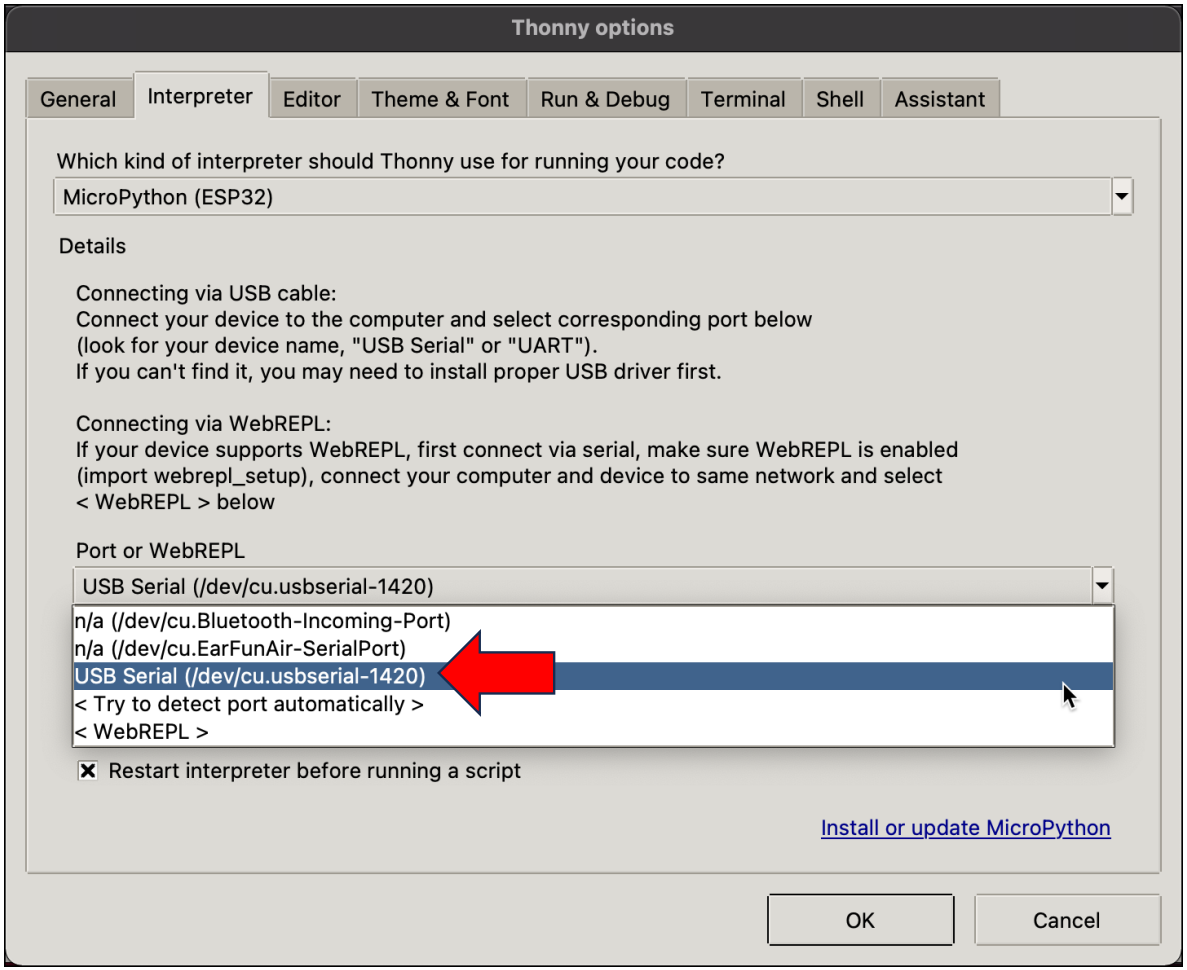
- To install Firmware.
- **Tools > Options**

2. Thonny Python IDE: Flushing New ESP32 Firmware.



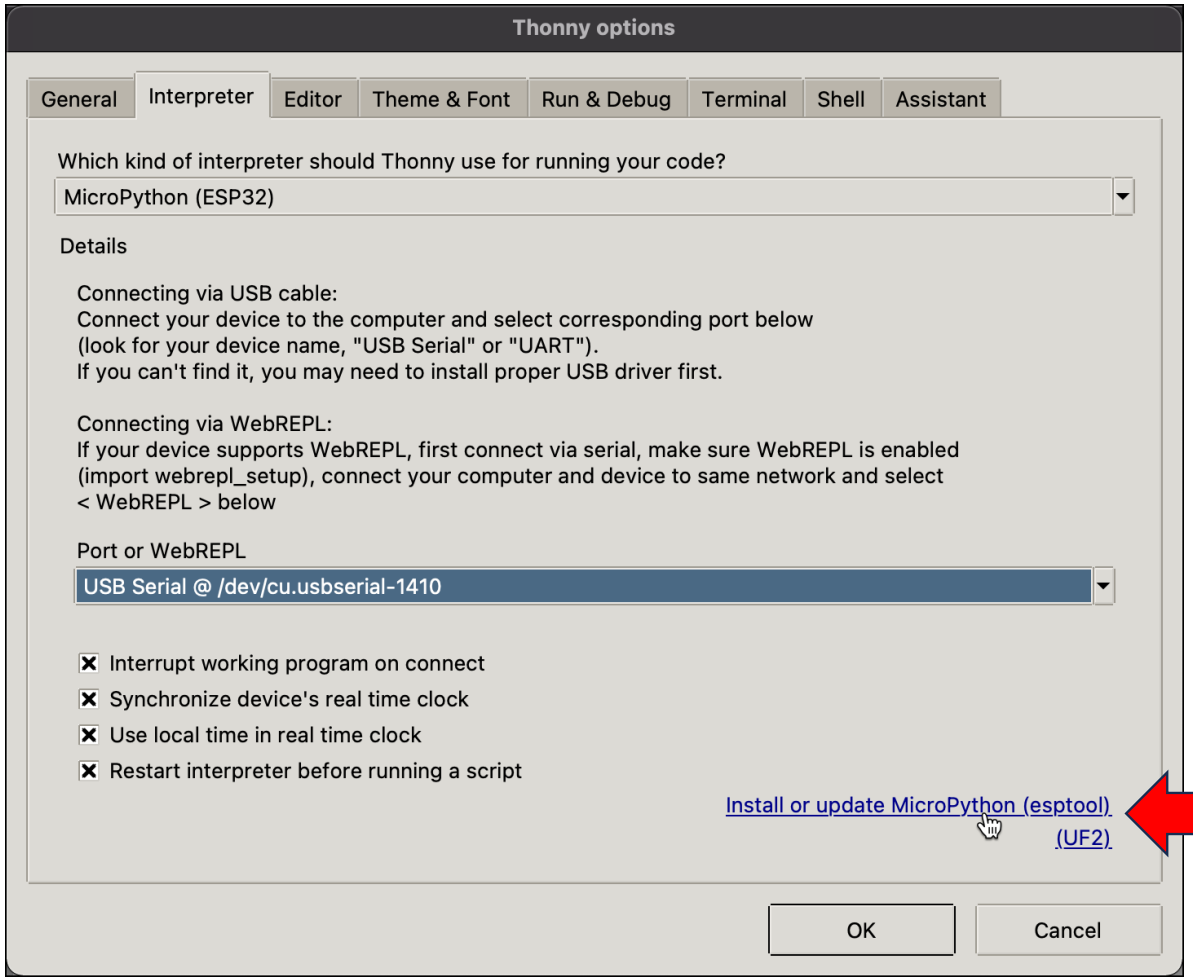
- Go to **Interpreter** tab.
- Select **MicroPython (ESP32)**.

2. Thonny Python IDE: Flushing New ESP32S Firmware.

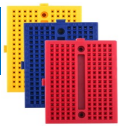


- **Port**: Choose the appropriate comm port of your ESP32S.
- **If port not detected, check your ESP32S connection to your laptop/PC.**

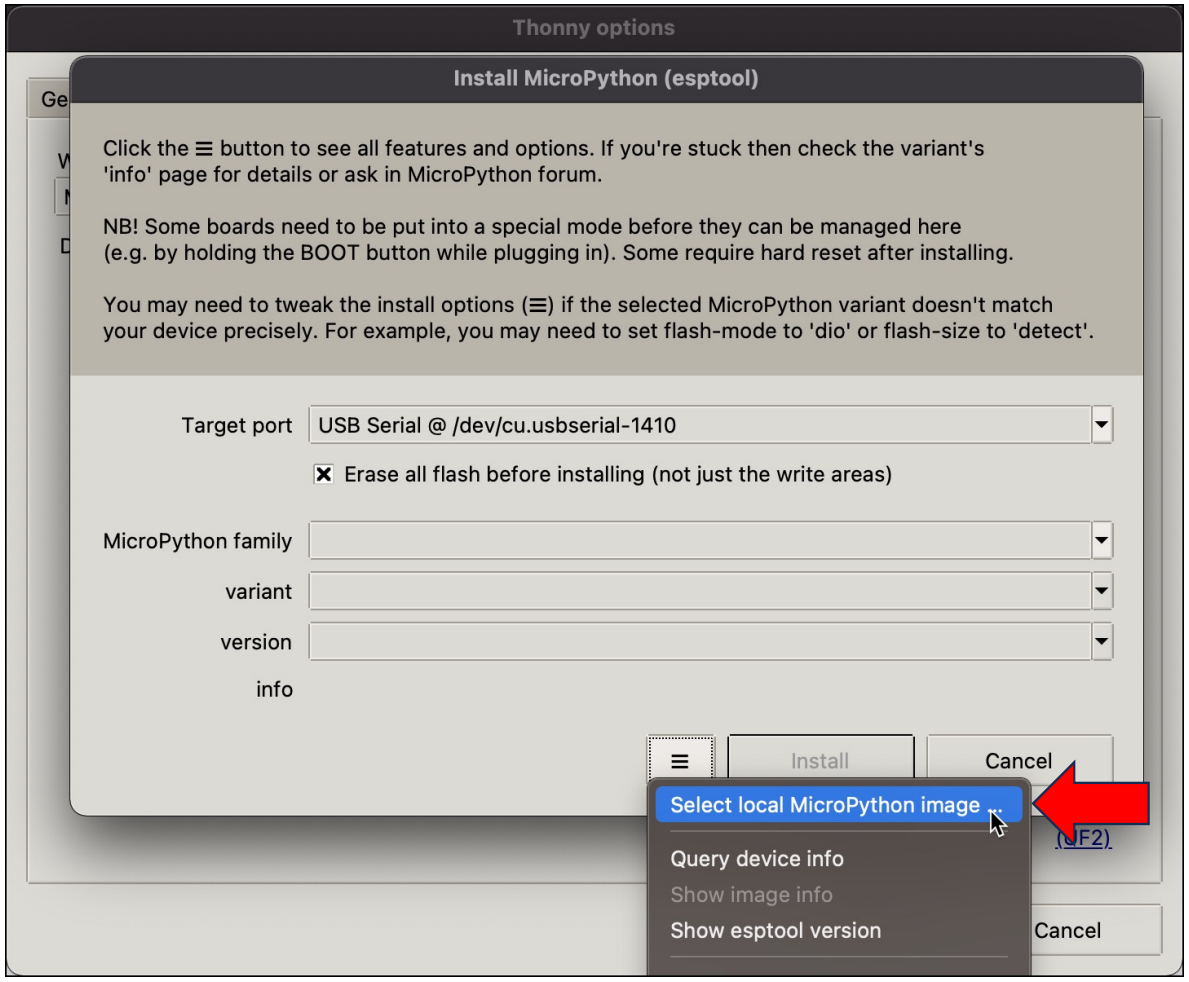
2. Thonny Python IDE: Flushing New ESP32 Firmware.



- **Click Install or Update Micropython** link.

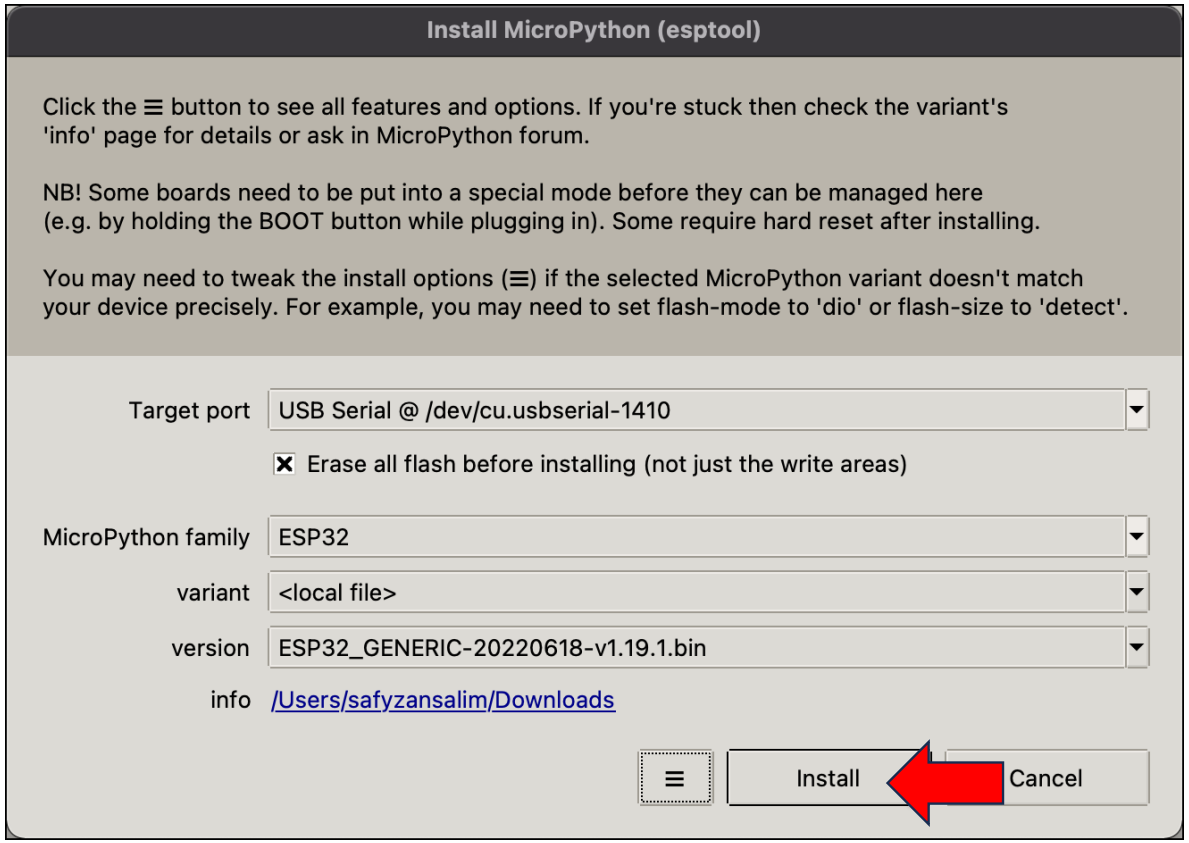


2. Thonny Python IDE: Flushing New ESP32S Firmware.



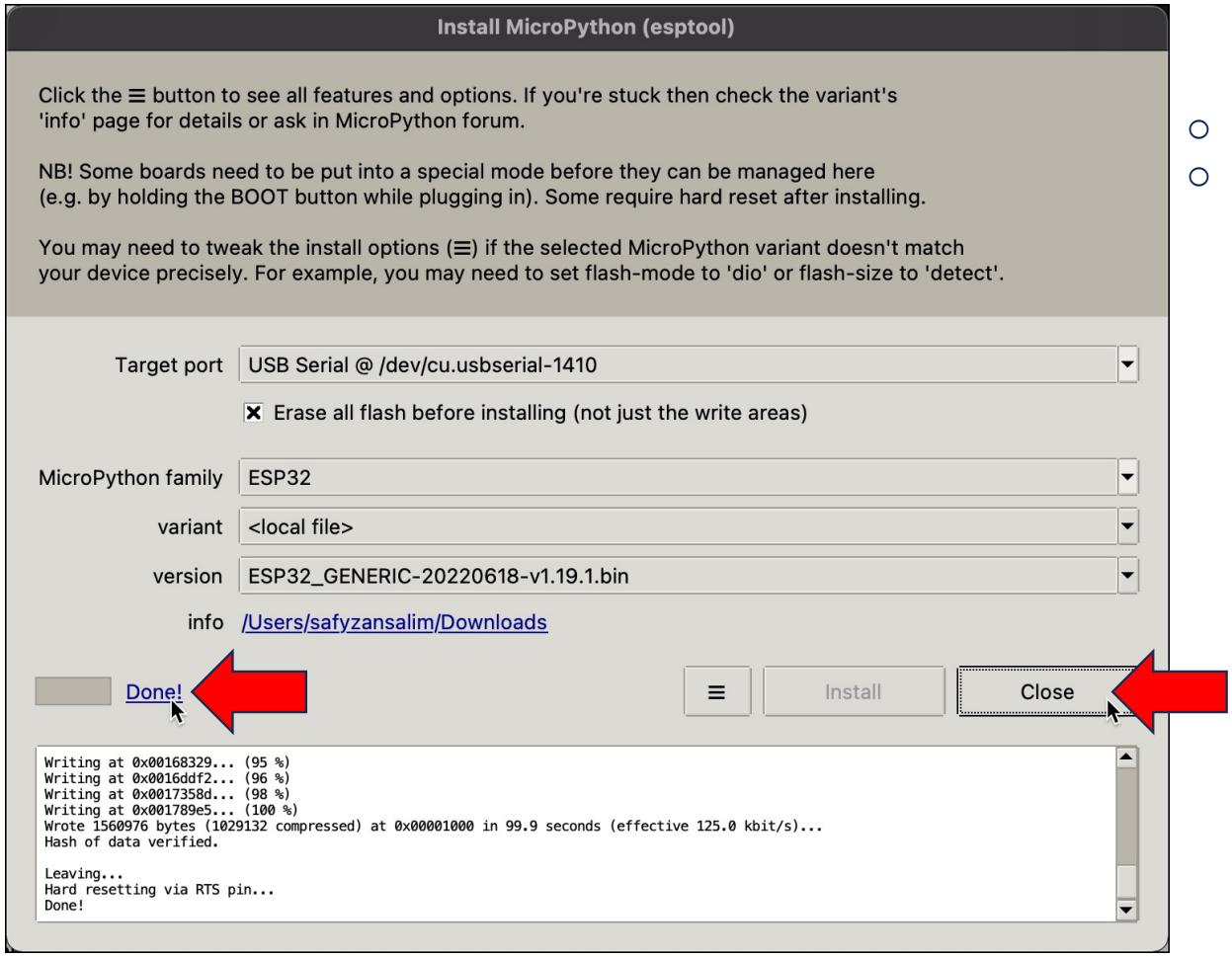
- **Target Port**: Which port the EPS32S is connected.
- ≡ : browse the downloaded **dot bin** file from micropython.org.
- **Ensure that the Erase flash before installing is checked.**

2. Thonny Python IDE: Flushing New ESP32S Firmware.



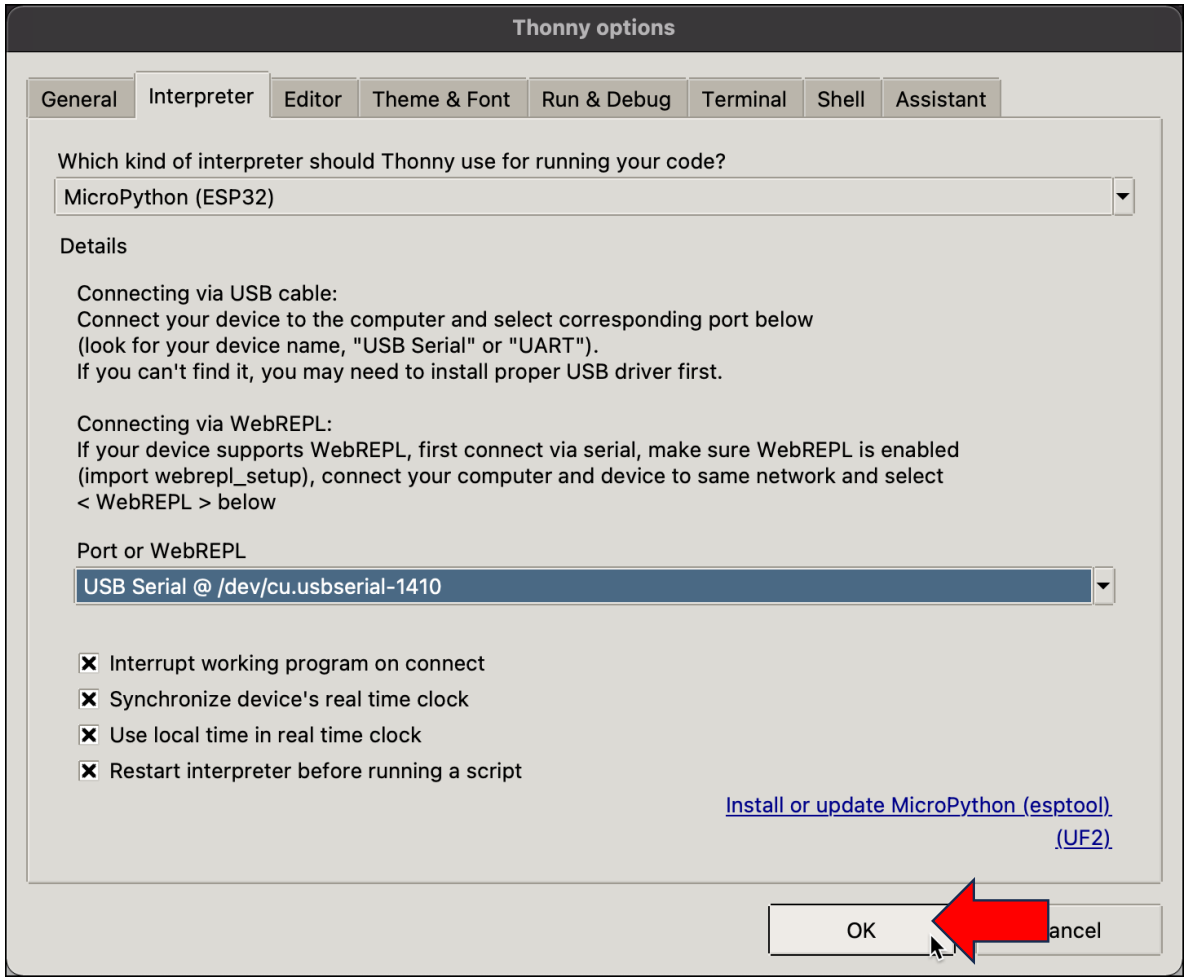
- Proceed with clicking **Install** button.

2. Thonny Python IDE: Flushing New ESP32S Firmware.



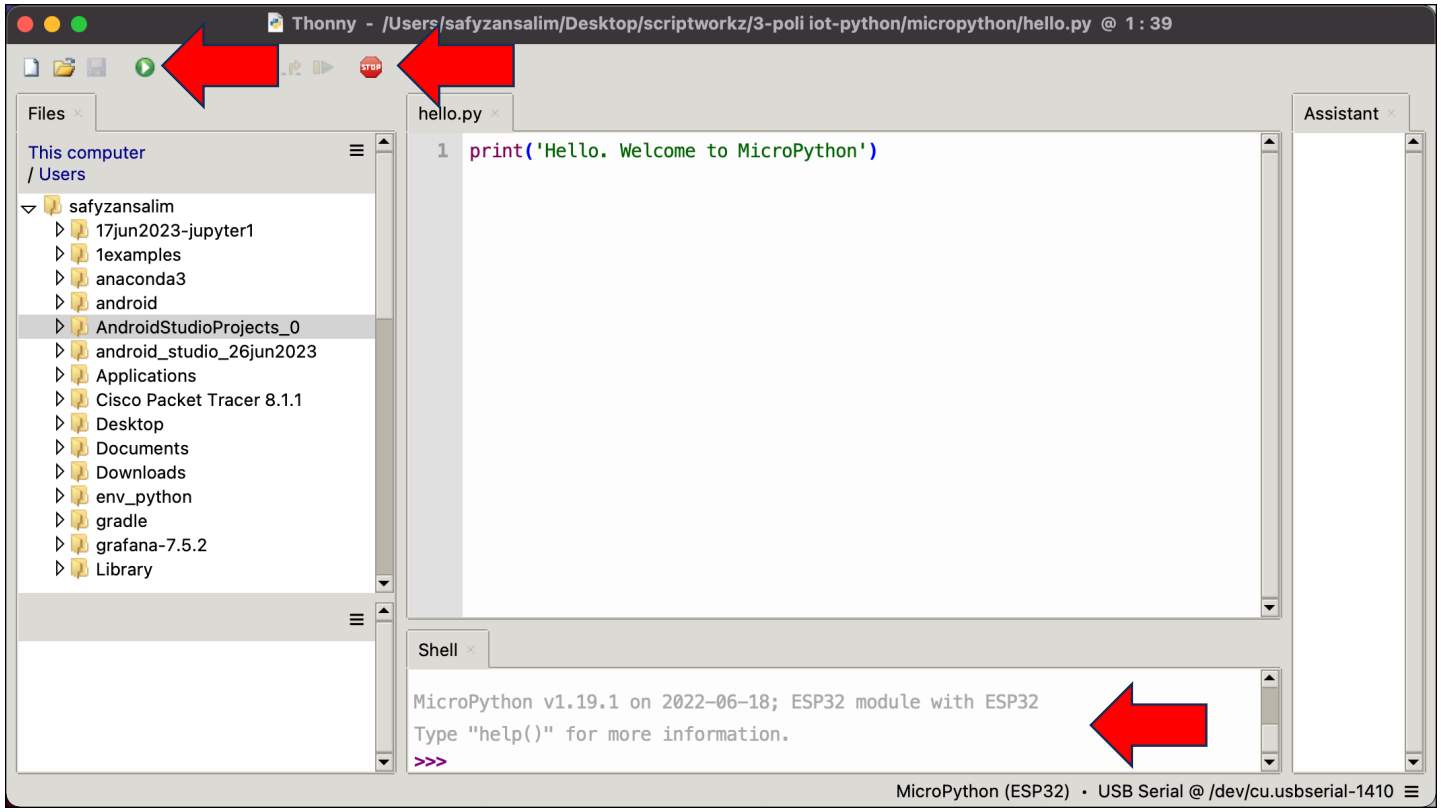
- Click **Done!** to view detail installation.
- Click **Close** button to go to previous page.

2. Thonny Python IDE: Flushing New ESP32S Firmware.

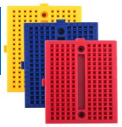


- Click **OK** button upon complete installation.

2. Thonny Python IDE: Flushing New ESP32S Firmware.



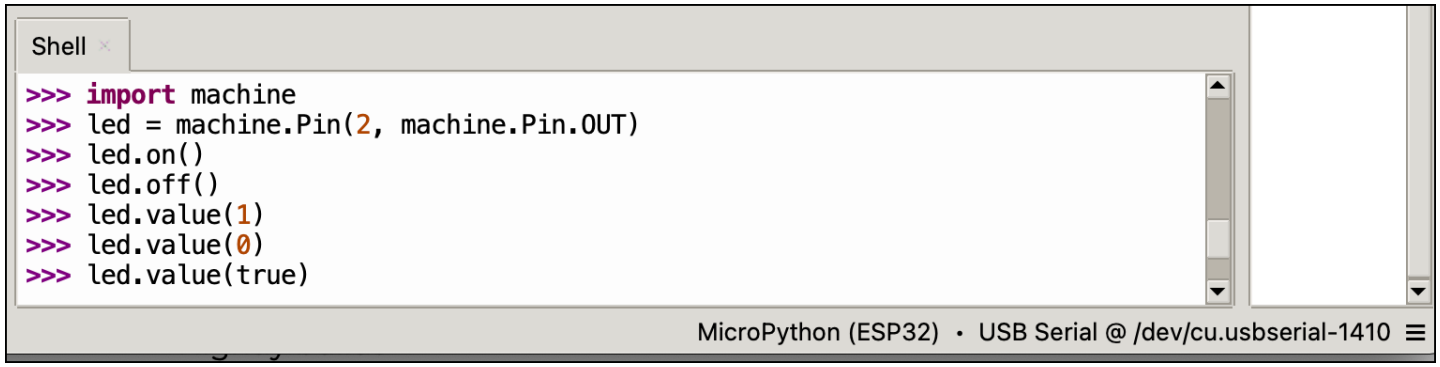
- Scripts that type at Shell, will respond immediately at ESP32.
- To stop click **Stop** button at the top.
- Click Run button to resume operation.



2. Thonny Python IDE: Point to **Shell** tab

```
import machine
led = machine.Pin(2, machine.Pin.OUT)
led.on()
led.off()
led.value(1)
led.value(0)
led.value(true)
led.value(false)
```

- Type the Python script line by line & press enter.
- Please refer to ESP32S & observe the output .



2. Thonny Python IDE: Point to **Shell** Tab or **A** Tab

```
import machine
led = machine.Pin(2, machine.Pin.OUT)
import time
while True:
    led.on()
    time.sleep(0.5)
    led.off()
    time.sleep(0.5)
```

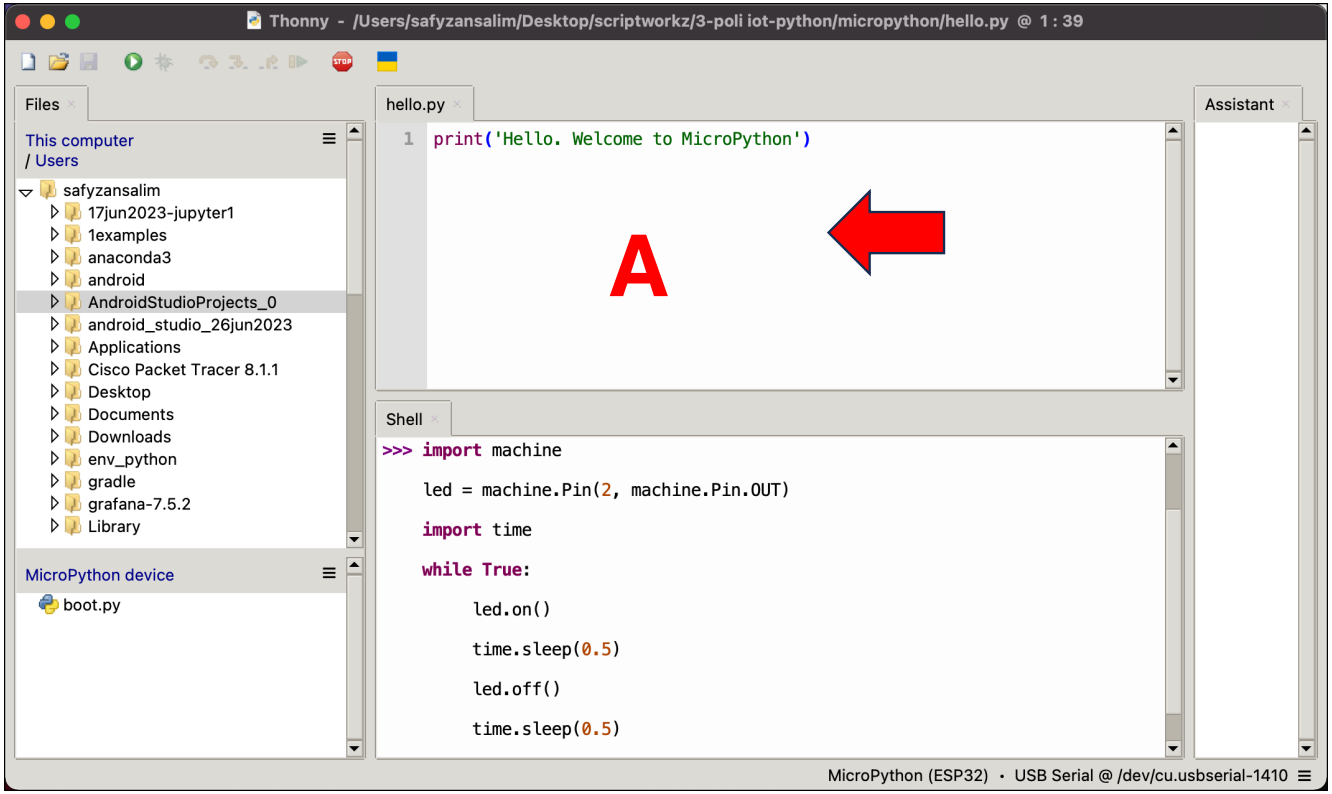
- Type at **A** if you wish to save the file

New

Run Current Script

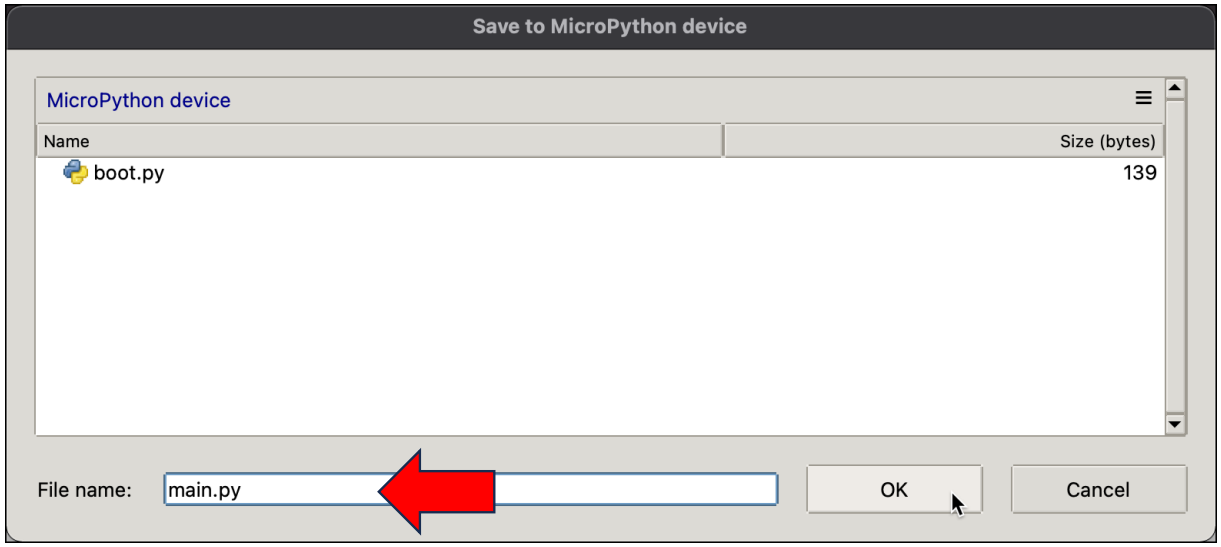
Open

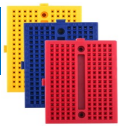
Stop / Restart



2. Thonny Python IDE: Saving Your Works

- You have two options to save your file: This computer or MicroPython device.
- Name you file as **main.py** if you wish to save into MicroPython board & any name if you wish to save into your drive.

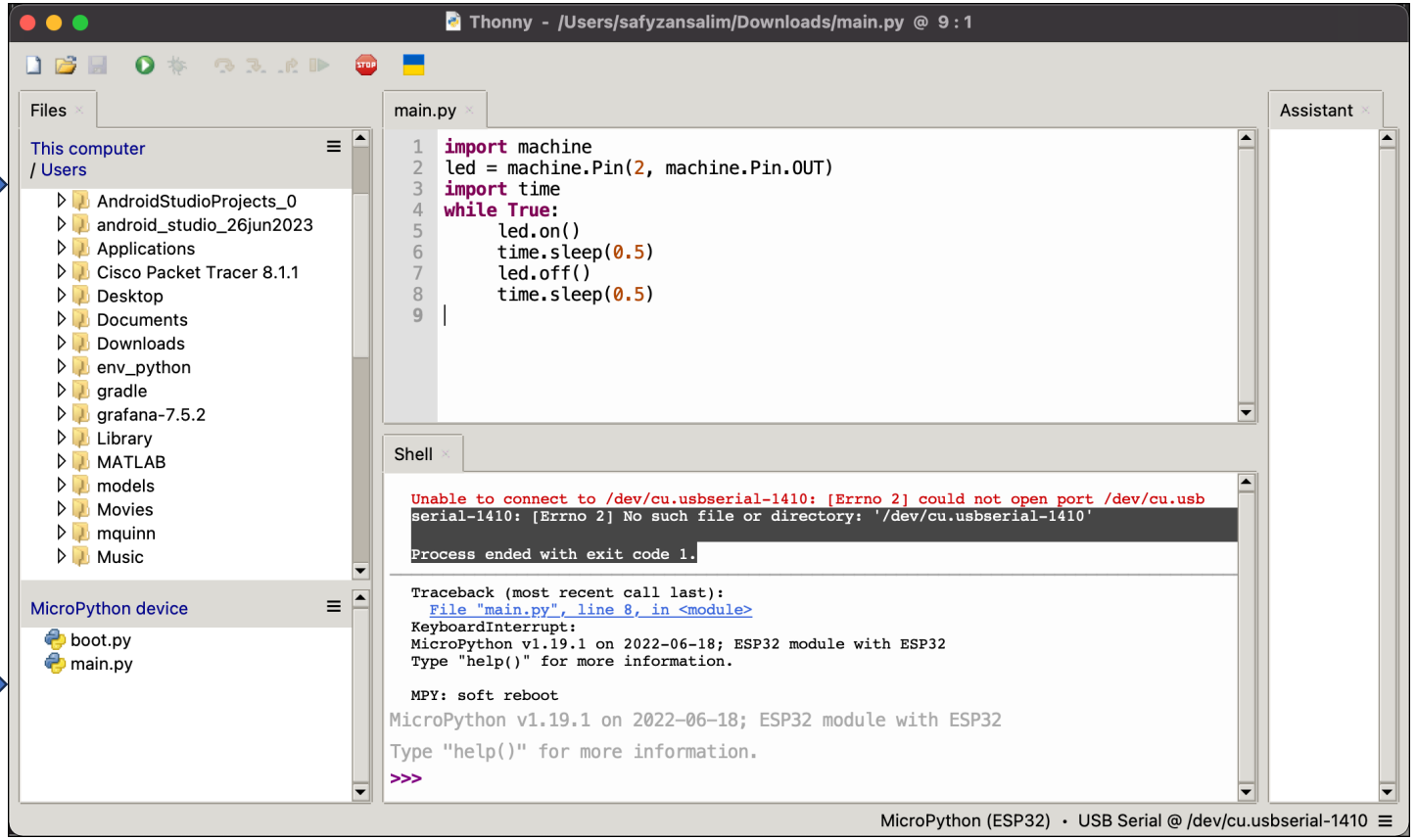


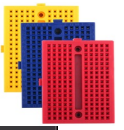


2. Thonny Python IDE: Saving Your Works

Your laptop / PC

Your microcontroller

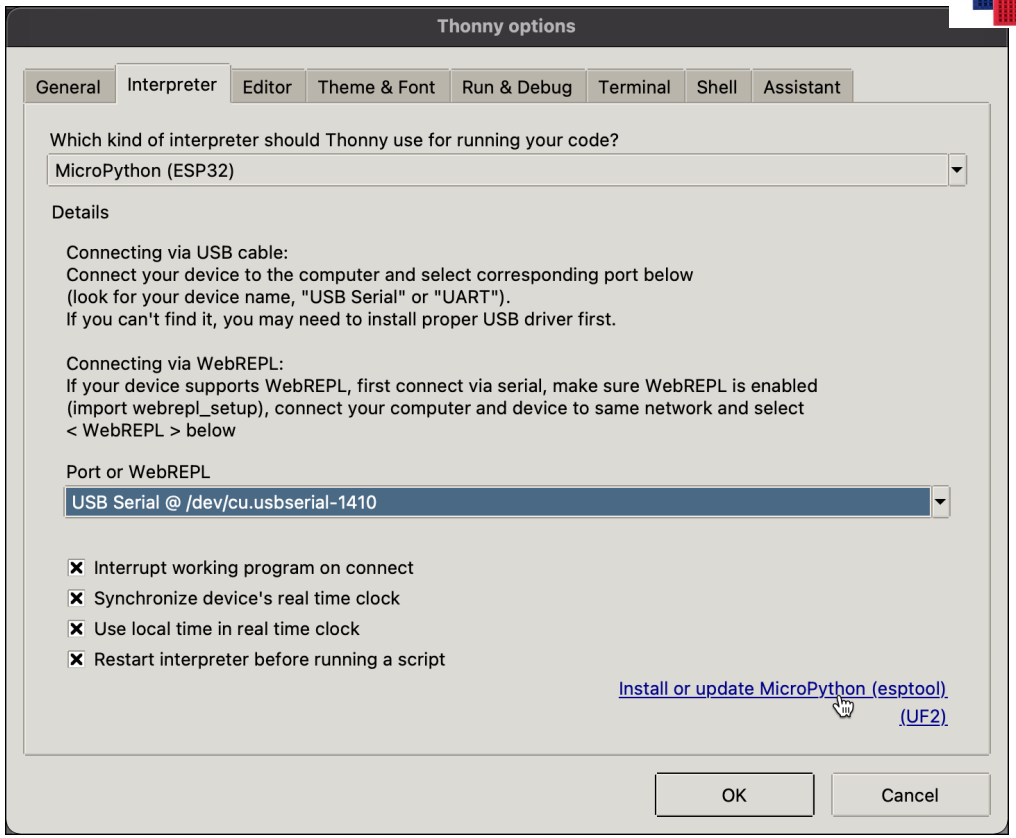




Remember:

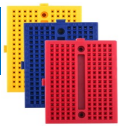
1. Always ensure that the you have selected the right Comm Port to communicate with ESP32.

Tools>Option>Interpreter Tab



2. Only upload MicroPython firmware once, unless you have uploaded Arduino ESP32 firmware, then you have to click the Install or update MicroPython link.

3. Open Arduino IDE, select ESP32 board, its port & upload Arduino sketch as usual.



END