

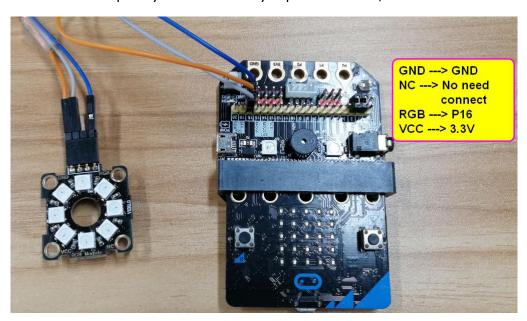
Breathing light

1. Learning target

In this course, we will learn how to use Raspberry Pi Pico and RGB halo module to achieve breathing light.

2. Preparation

Connect the module to Raspberry Pi Pico board by expansion board, as shown below.



3. About code

```
Breathing_light.py ×
 1 import time
    from ws2812b import ws2812b
 3
 4 num leds = 8 # Number of NeoPixels
 5 # Pin where NeoPixels are connected
 6 pixels = ws2812b(num_leds, 0,17)
 8 pixels.fill(0,0,0)
 9
    pixels.show()
10
11 i = 0
12 brightness = 0
    fadeAmount = 1
13
14
15
    while True:
16
        for i in range(num leds):
             pixels.set_pixel(i,0,brightness,brightness)
17
18
        pixels.show()
19
        brightness = brightness + fadeAmount
20
        if brightness <= 0 or brightness >= 200:
            fadeAmount = -fadeAmount
21
22
        time.sleep(0.005)
```

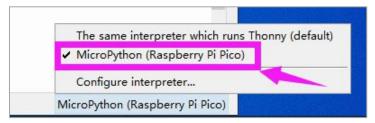


4. Import library file

4.1 Connect Pico to your computer, as shown below.



4.2 Open the Thonny software, click the lower right corner to connect the Pico board.

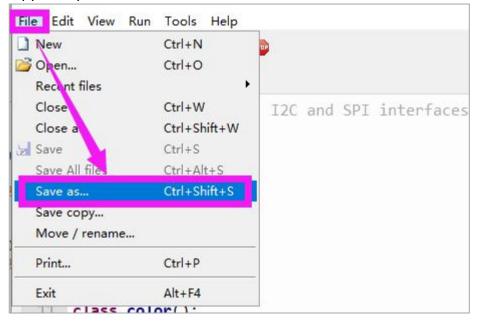


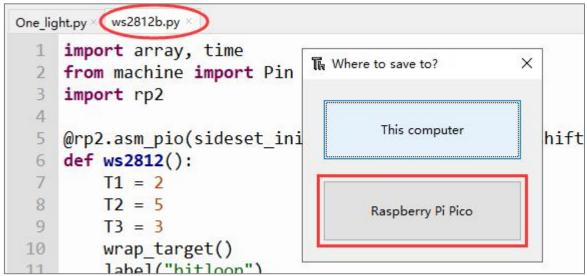
4.3 Open the gesture.py in library folder by Thonny software.

```
File Edit View Run Tools Help
🗋 📂 📗 🔘 🐡 🤼 🥸 🕪 🚥
 gesture.py ×
      # MicroPython driver, I2C and SPI interfaces
   3
      import time
   4
      Init_Register_Array = [
   6
               [0xEF,0x00],
              [0x37,0x07],
   8
              [0x38,0x17],
   9
              [0x39,0x06],
  10
              [0x41,0x00],
  11
               [0x42,0x00],
  12
              [0x46,0x2D],
  13
              [0x47,0x0F],
              [0x48,0x3C],
  14
  15
              [0x49,0x00],
  16
               [0x4A,0x1E],
  17
               [0x4C, 0x20],
  18
              [0x51,0x10],
  19
              [0x5E, 0x10],
  20
              [0x60,0x27],
 Shell
```



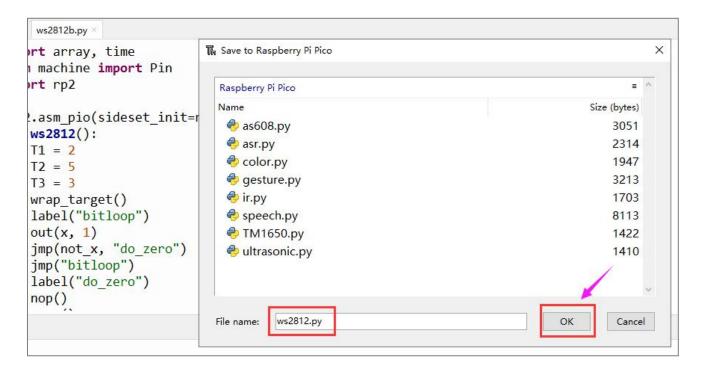
4.4 Save as this .py library file into Pico.





4.5 Enter the same file name as the library file. Then, click "OK".





5. Compiling and downloading code

5.1 We can open the Breathing light.py file by Thonny software.

```
File Edit View Run Tools Help
Breathing_light.py ×
     import time
  2
     from ws2812b import ws2812b
  4 num leds = 8 # Number of NeoPixels
  5 # Pin where NeoPixels are connected
    pixels = ws2812b(num leds, 0,17)
  7
  8
    pixels.fill(0,0,0)
     pixels.show()
  10
 11
     i = 0
     brightness = 0
     fadeAmount = 1
 13
 14
     while True:
 15
 16
         for i in range(num leds):
 17
             pixels.set pixel(i,0,brightness,brightness)
 18
         pixels.show()
         brightness = brightness + fadeAmount
 19
  20
         if brightness <= 0 or brightness >= 200:
  21
             fadeAmount = -fadeAmount
         time.sleep(0.005)
  22
```



5.2 In Thonny menu bar, we need to click run button to run this program. "%Run -c \$EDITOR_CONTENT" will be displayed. As shown below.

```
MicroPython v1.13-290-g556ae7914 on 2021-01-21; Raspberry Pi Pico with RP2040
Type "heln()" for more information.

>>> "Run -c $EDITOR CONTENT"
>>>
```

6. Phenomenon

After the program is run successfully. All RGB lights from on to off, and then from off to on, keep looping in this state, realizing the effect of breathing light.