# RGB three-color lights

1. Learning target

1.1 In this course, we will learn how to use pins of the Raspberry Pi Pico board.

1.2 How to control the RGB light module.

2. Preparation

Raspberry Pi Pico board *1

Pico sensor expansion board *1

PC *1

USB data cable *1
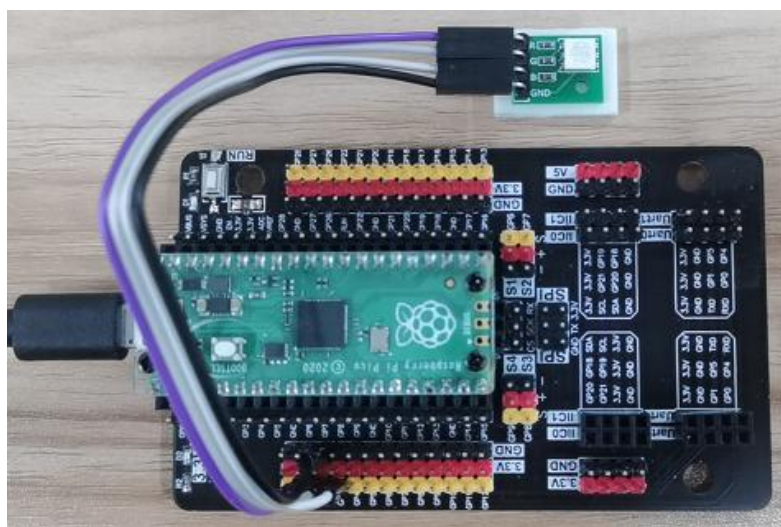
RGB light module *1

male-to-male DuPont line *4

Note:

The RGB three-color light module is composed of three LEDs: red, green, and blue. When we provide high-level voltage to the R, G, and B pins, it will light up the corresponding color, and it is low-level voltage, RGB light will turn off.
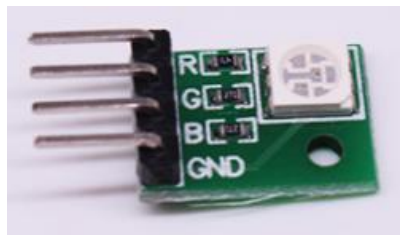
3. About wiring

RGB light module	Pico sensor expansion board
R	GP1
G	GP2
B	GP3
GND	GND

4. About code
Thonny programming
About how to using ThonnyIDE, please check the tutorials in【2.Development environment】

```python
from machine import Pin
import utime

# Initialize the LED lights
red = Pin(1, Pin.OUT)
green = Pin(2, Pin.OUT)
blue = Pin(3, Pin.OUT)

# Control the red light, state=0 light is off, state= other values light is on
def rgb_red(state):
    if state == 0:
        red.value(0)
    else:
        red.value(1)

# Control the green light, state=0 light is off, state= other values light is on
def rgb_green(state):
    if state == 0:
        green.value(0)
    else:
        green.value(1)

# Control the blue light, state=0 light is off, state= other values light is on
def rgb_blue(state):
    if state == 0:
        blue.value(0)
    else:
        blue.value(1)

# Close RGB light
def rgb_off():
    red.value(0)
    green.value(0)
    blue.value(0)

# RGB light become white
def rgb_on():
    red.value(1)
    green.value(1)
    blue.value(1)
```

```
# Main loop, switch a color every 0.5s
while True:
    rgb_off()
    rgb_red(1)
    utime.sleep(.5)

    rgb_off()
    rgb_green(1)
    utime.sleep(.5)

    rgb_off()
    rgb_blue(1)
    utime.sleep(.5)

    rgb_on()
    utime.sleep(.5)
```

5. Phenomenon

Click the green run button of Thonny IDE to start running the program. Click the red stop

button to stop the program.

When the program is running, RGB three-color light will cyclically light up red, green, blue, and white, switching a color every 0.5 seconds.