Human induction lamp

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 use a human body sensor, RGB three-color light, and photosensitive module to make a human body sensor smart light.

2. Preparation

Raspberry Pi Pico board *1

Pico sensor expansion board *1

PC *1

USB data cable *1

Human body sensor module *1

RGB three-color light module *1
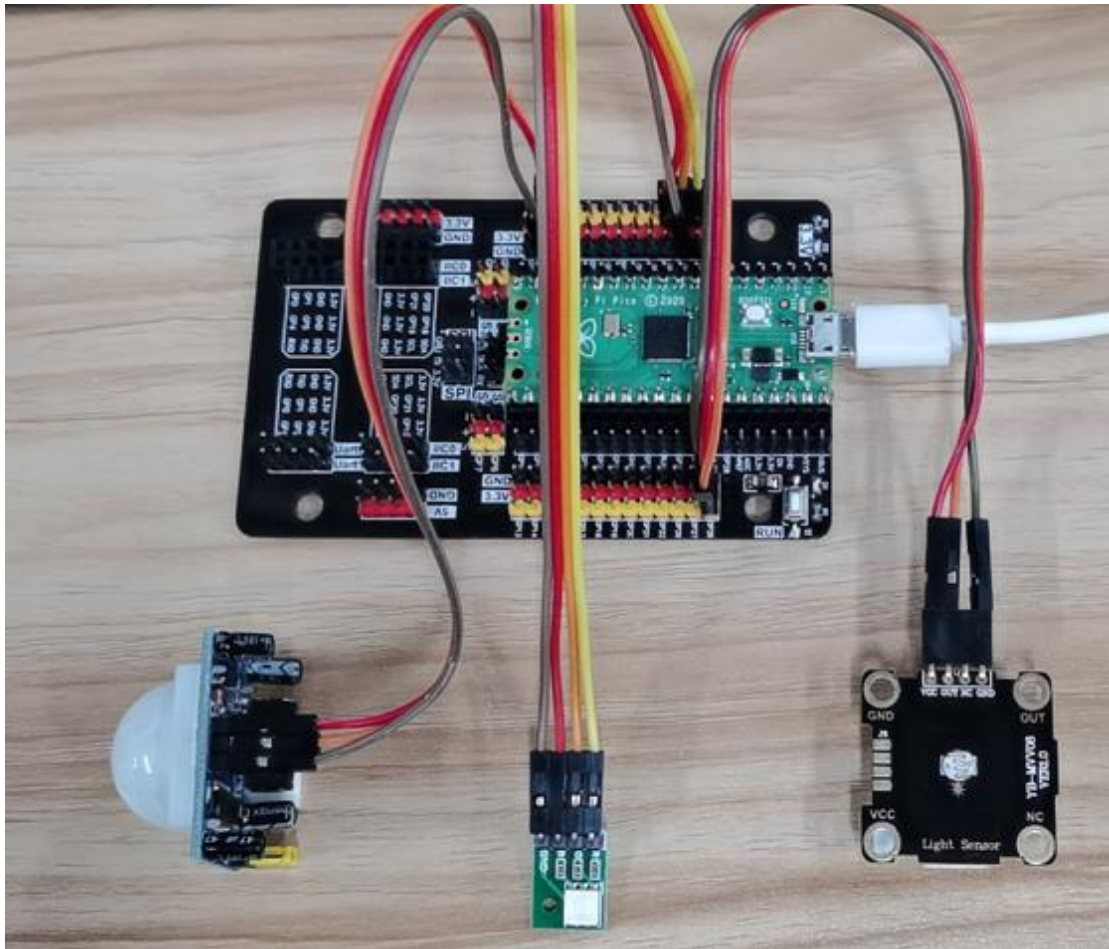
Photosensitive module *1

Female-to-male DuPont line *3

Male-to-male DuPont line *7

3. About wiring

Photosensitive module	Pico sensor expansion board
VCC	3.3V
OUT	GP28
GND	GND

Human body sensor module	Pico sensor expansion board
VCC	3.3V
OUT	GP11
GND	GND

RGB three-color 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, ADC
import utime

# Human detection sensor pin
human = Pin(11, Pin.IN)


# Initialize the photosensitive sensor pin to GP28 (ADC function)
light = ADC(28)

red = Pin(1, Pin.OUT)
green = Pin(2, Pin.OUT)
blue = Pin(3, Pin.OUT)

led = Pin(25, Pin.OUT)

# Turn off the RGB light
def rgb_off():
```

```python
        red.value(0)
        green.value(0)
        blue.value(0)

# Turn on the RGB light, white
def rgb_on():
        red.value(1)
        green.value(1)
        blue.value(1)

# Open on board LED
def led_on():
        led.value(1)

# Close on board LED
def led_off():
        led.value(0)

# Read the current analog value of the photosensitive sensor, range [0, 100]
# The stronger the light intensity, the smaller the value.
def get_value():
        return int(light.read_u16() * 101 / 65536)


def detect_someone():
        if human.value() == 1:
                return True
        return False


abc = 0

while True:
        val = get_value()
#         print('val=', val)

        if val >= 50:
                led_on()
                if detect_someone() == True:
                        abc += 1
                        rgb_on()
                        print("value=", abc)
                        utime.sleep(1)
                else:
```

```
            if abc != 0:
                    abc = 0
                    rgb_off()
    else:
        led_off()
        rgb_off()

    utime.sleep(.1)
```

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, cover the photosensitive module

with your hand to simulate the dark state, we can see that the built-in LED light on the Pico board lights up, and then put the other hand in front of the human sensor sensor, we can see the RGB three-color light is on , and it will automatically shut down after a few seconds delay.
If the photosensitive module is not covered, we can see that the built-in LED light on the Pico board lights off. At this time, if we approach the human sensor module with our hand, the RGB three-color light will keep off.