

Summer cooling artifact

1.Learning goals

In this course, we mainly learn how to use Python programming to make the Oscillating fan rotate and shake left to right at different speeds. At the same time, the dynamic picture of the windmill rotating is displayed on the micro:bit lattice.

2.Building block assembly steps

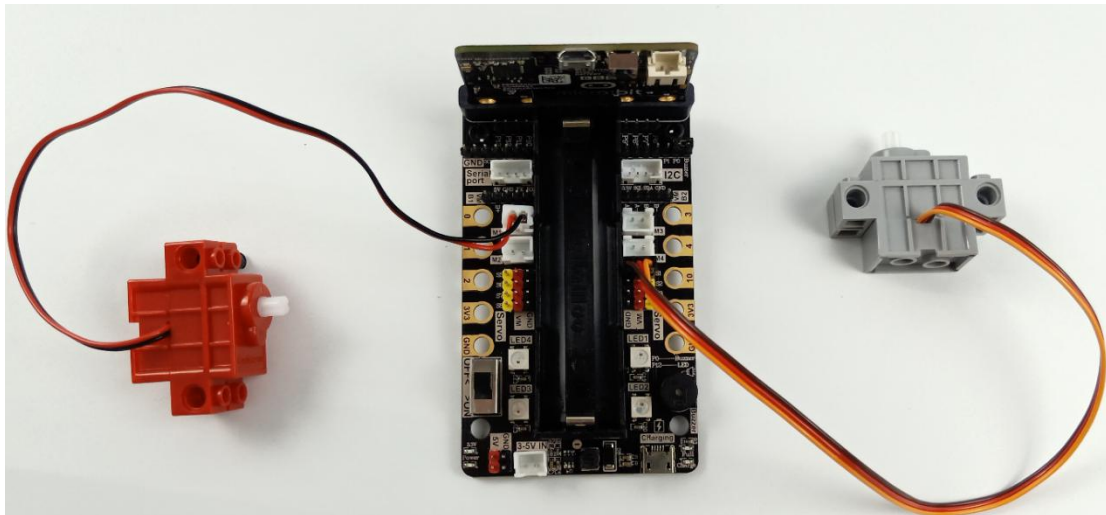
For the building block construction steps, please refer to the installation manual or building block installation picture of [Assembly course]-[Oscillating fan].

3.Wiring of motor and servo

The motor wiring is inserted into the M1 interface of the Super:bit expansion board, and the black wire is close to the battery side;

Building block servo insert into the Super:bit expansion board S1 interface, and the orange wiring connect the yellow pin of S1.

As shown below.



4.Code and analysis

The program for this course, please view .py file.

```
1 from microbit import *  
2 import superbitt  
3 import microbit  
4 import neopixel
```

First, we need to import the library needed for this lesson from micro:bit, superbitt library is dedicated to super:bit expansion board; music library is used to play music; neopixel is used to control RGB lights.

```

6 np = neopixel.NeoPixel(pin12, 4)
7 fan = Image("00990:90900:99999:00909:09900")
8 display.show(fan)

```

np = neopixel.NeoPixel(pin12, 4): RGB lamp initialization settings, a total of 4 RGB lamps, connected to the P12 pin of the micro:bit board (you can check the hardware interface manual);

fan = Image("00990:90900:99999:00909:09900")

display.show(fan): Display fan pattern on micro:bit matrix.

```

10 global a, b, angle
11 angle = 135
12 b = 0
13 superbit.servo270(superbit.S1, angle)
14 microbit.sleep(1000)

```

global a, b, angle : Defined variable a, b, angle

angle = 135: Initializing variable angle is 135

b = 0: Initialize the variable b to 0

superbit.servo270(superbit.S1, angle): Initialize the servo to 135°

microbit.sleep(1000): Delay 1000 ms

```

16 while True:
17     superbit.motor_control(superbit.M1, 225, 0)
18     if b == 0:
19         superbit.servo270(superbit.S1, angle)
20         angle = angle + 1
21         if angle > 270:
22             angle = 270
23             b = 1
24     elif b == 1:
25         superbit.servo270(superbit.S1, angle)
26         angle = angle - 1
27         if angle < 0:
28             angle = 0
29             b = 0

```

while True:

superbit.motor_control(superbit.M1, 225, 0): The motor is rotating at a speed of 255

if b == 0: Determine the value of variable B

superbit.servo270(superbit.S1, angle)

angle = angle + 1 The servo angle increases by 1 each time

if angle > 270: Limit servo angle to a maximum of 270 degrees

angle = 270

b = 1

```

elif b == 1: Determine the value of variable B
    superbit.servo270(superbit.S1, angle)
    angle = angle - 1 The servo angle decreases by 1 each time
    if angle < 0: Limit servo angle to a minimum of 0 degrees
        angle = 0
    b = 0

```

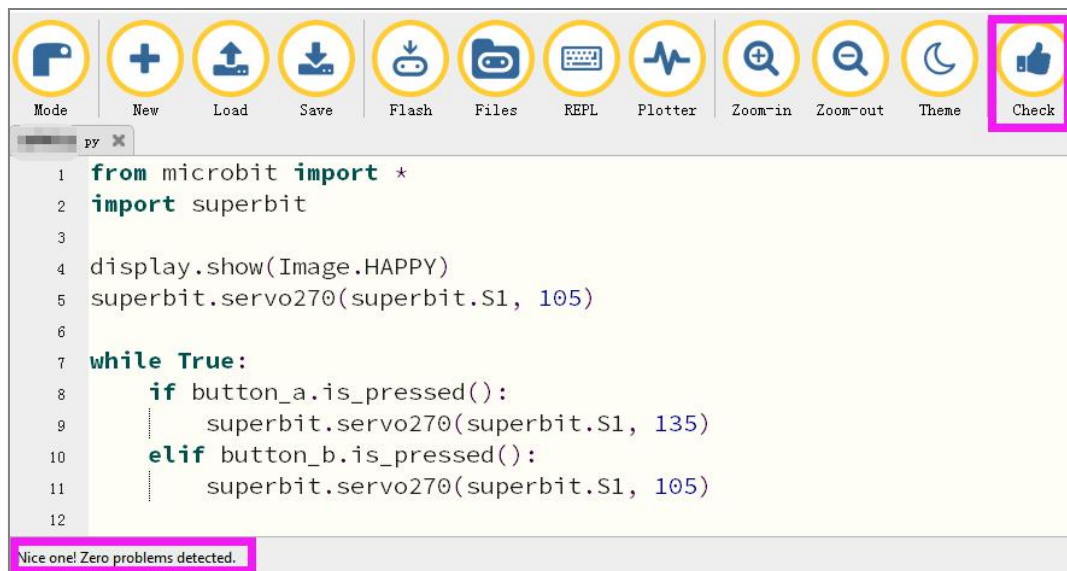
5. Writing and download code

1. You should open the Mu software, and enter the code in the edit window, as shown below.

Note! All English and symbols should be entered in English, use the Tab key (tab key) to indent and the last line must be a space.

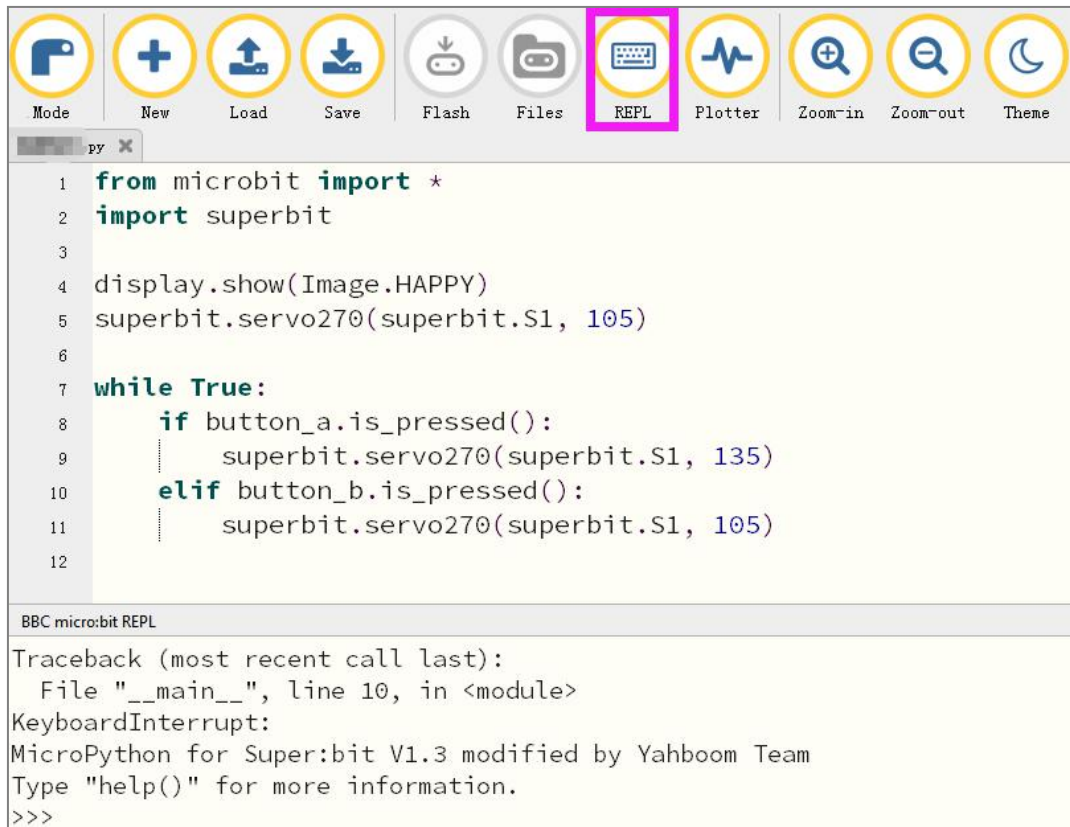
2. You can click the "Check" button to check if our code has an error.

If a cursor or underline appears on a line, it indicates a syntax error, please check and modify. If there is no error in the program, the bottom left of the interface will prompt that there is no problem in detection.

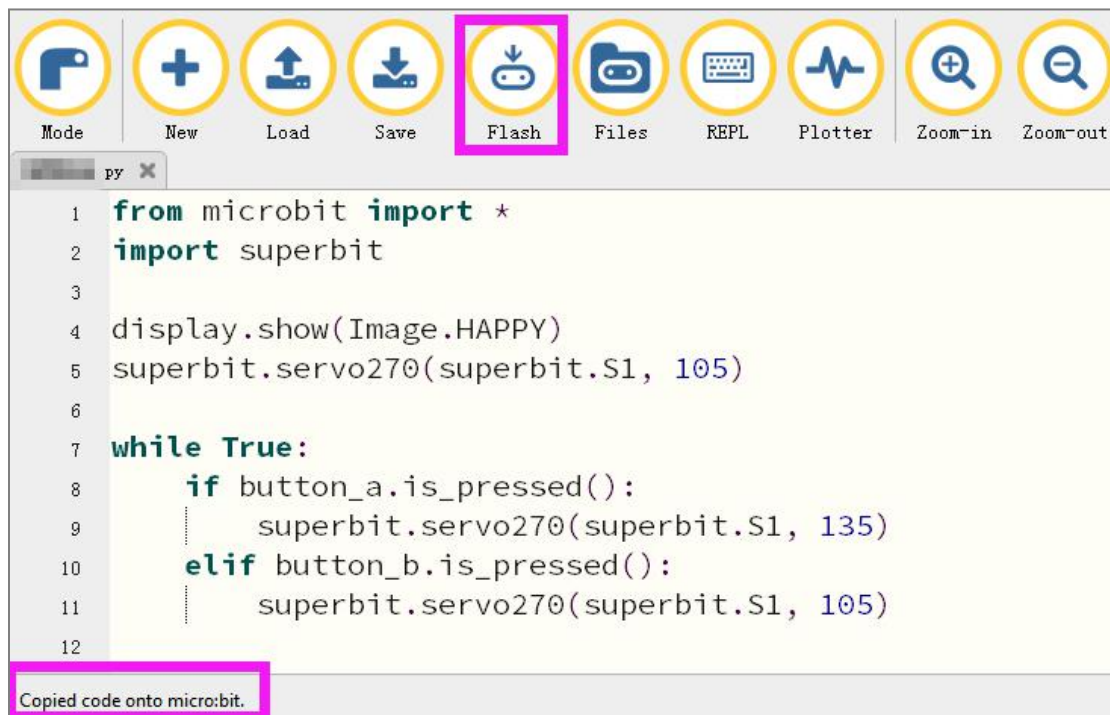


3. Click the 'REPL' button to check whether the Superbit library has been downloaded.

If not, please refer to [Preparation before class] --> [2.4 Python Programming Guide] .



4. After the program is written, use a micro USB cable to connect the computer and the micro:bit board. Please click the 'Flash' button to download the program to the micro:bit motherboard (You need to click the 'REPL' button again to close the function of importing library files before you download the program).



5. If the download failed, please confirm whether the micro:bit is connected to the computer through the micro USB data cable, and confirm whether the Super:bit

Python library has been imported.

6.Experimental phenomena

After the program is successfully downloaded, the micro:bit dot matrix will display the fan pattern.

Then, the Oscillating fan starts to rotate at the maximum speed of 255, shaking its head from left to right, and keeps loop in this state.

If you need to restart, press the reset button on the back of the micro:bit board.