Adjustable fan

1. Learning objectives

In this course, we mainly learn how to adjust the fan angle through Python programming.

2. Building blocks

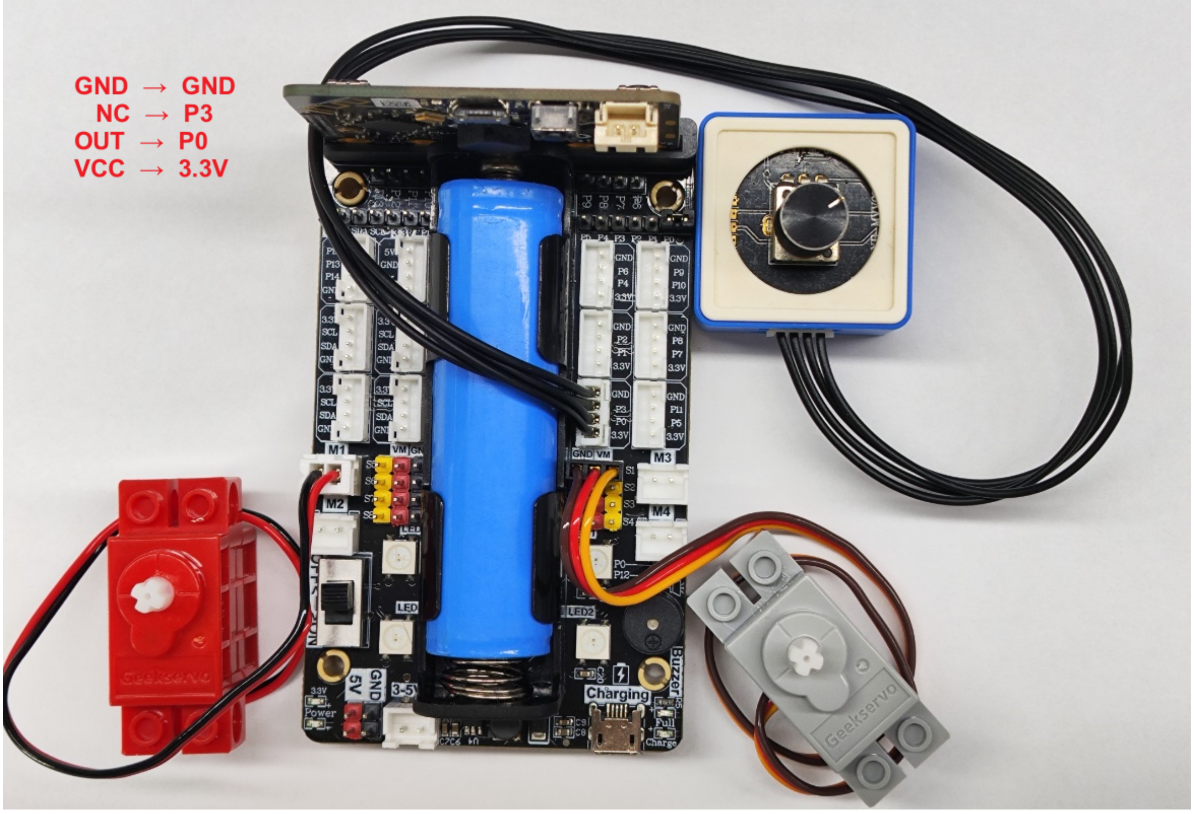
For the building blocks steps, please refer to the installation drawings of [Assembly Course]--[Adjustable fan] in the materials or the building blocks installation brochure.

3. Sensor wiring

Insert the building blocks motor wiring into the M1 interface of the Super:bit expansion board, and the black wiring into the side close to the battery.

Insert the building blocks servo wiring into the S1 interface of the Super:bit expansion board, and the orange servo wiring into the yellow pin of S1.

The potentiometer is connected to the P0P3 pin.



4. Code analysis

For the program of this course, please see the **Adjustable-fan.py** file.

```
from microbit import *
import WOM_Sensor_Kit
import superbit
```

First, import the libraries needed for this lesson from microbit: the WOM_Sensor_Kit library is used for sensors; the superbit library is dedicated to the superbit expansion board.

```
fan1 = Image("00990:90900:99999:00909:09900")
fan2 = Image("99009:09099:00900:99090:90099")
```

Customize two fan patterns;

```
superbit.servo270_V2(superbit.S1, 0)
display.show(Image.HEART)
sleep(400)
```

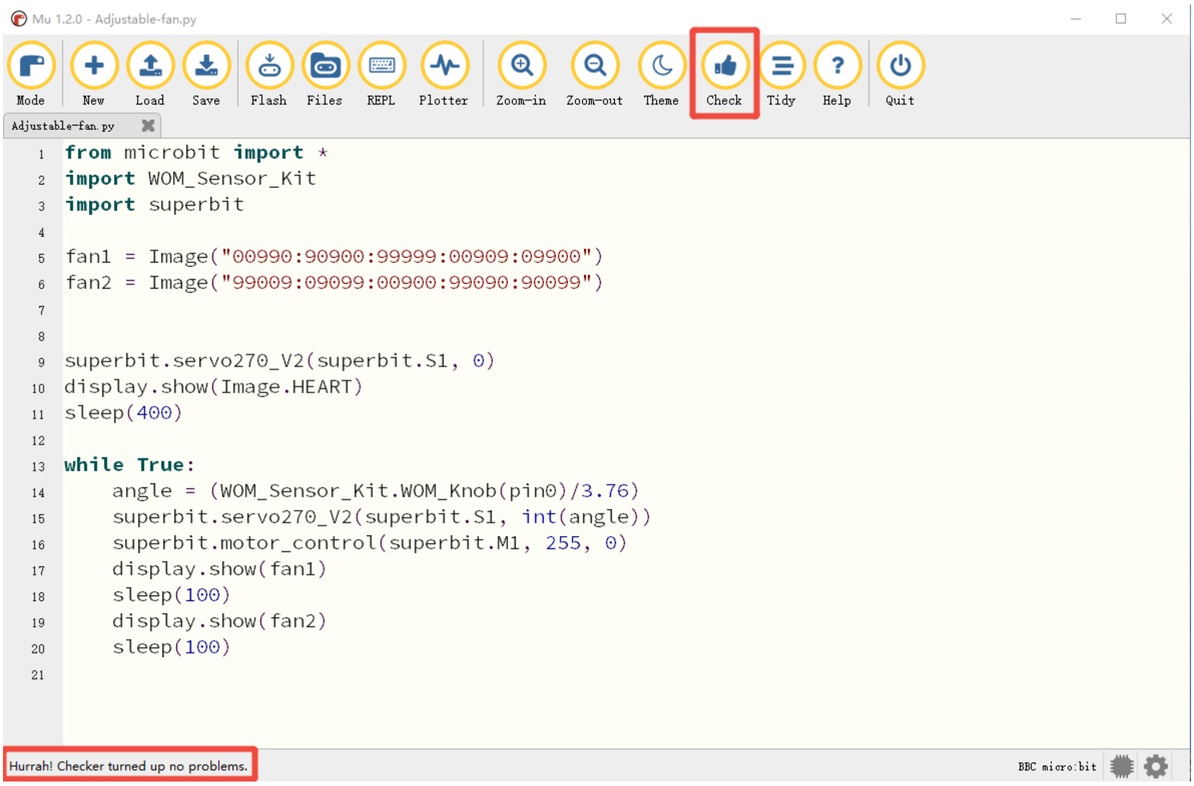
Initialize the servo to 0 degrees, and the microbit dot matrix displays a heart;

```
while True:
angle = (WOM_Sensor_Kit.WOM_Knob(pin0)/3.76)
superbit.servo270_V2(superbit.S1, int(angle))
superbit.motor_control(superbit.M1, 255, 0)
display.show(fan1)
sleep(100)
display.show(fan2)
sleep(100)
```

In an infinite loop, read the value of the knob and convert it into an angle, control the 270° servo on S1 to rotate to the corresponding angle; then let the M1 motor rotate forward at a speed of 255 to keep the fan running; then display the two fan patterns in turn, each pattern is displayed for 100 milliseconds, forming an animation effect of fan rotation.

5. Write and download the program

1. Open the Mu software and enter the code in the editing window. **Note! All English and symbols should be entered in English mode, use the Tab key (tab key) for indentation, and the last line ends with a blank program.**
2. Click the thumb 'Check' button to check whether our code has any errors. If a cursor or underline appears in a line, it means a syntax error. Please check and modify it. If there is no error, the lower left corner will prompt that there is no problem with the detection.



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fan1 = Image("00990:90900:99999:00909:09900")
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display.show(Image.HEART)
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while True:
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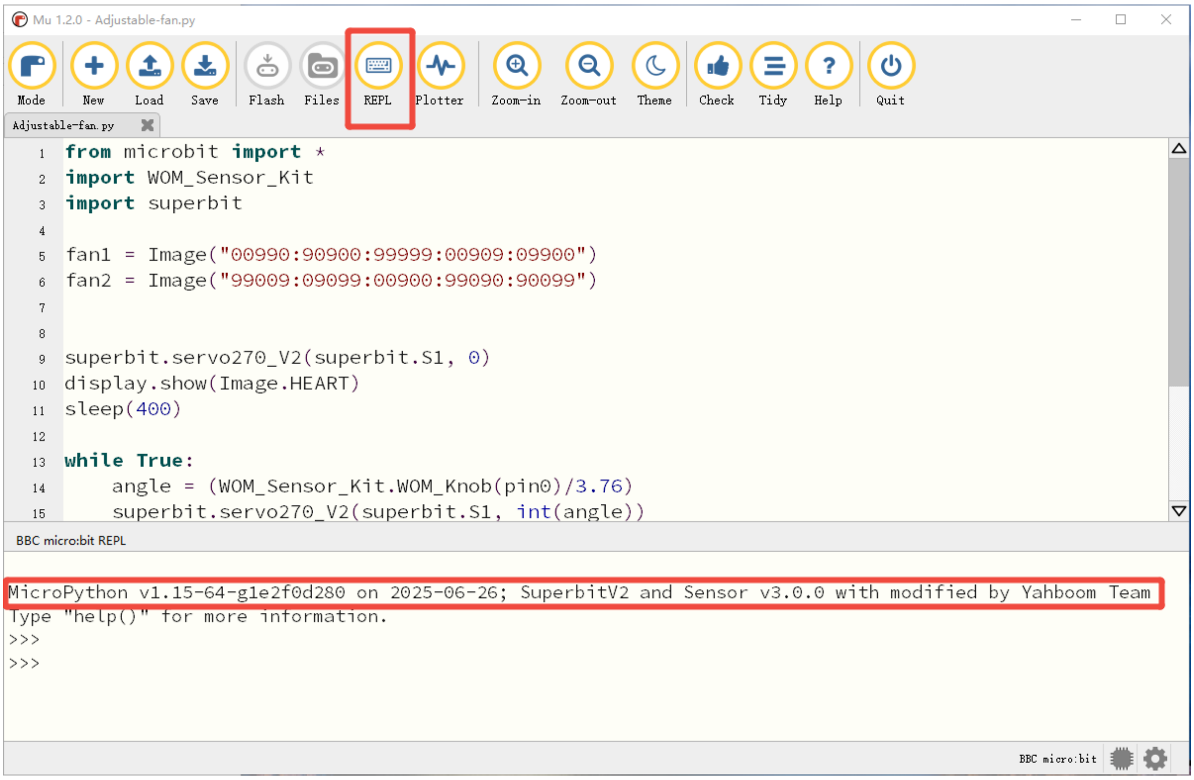
    superbit.motor_control(superbit.M1, 255, 0)
    display.show(fan1)
    sleep(100)
    display.show(fan2)
    sleep(100)

```

Hurrah! Checker turned up no problems.

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].



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import superbit

fan1 = Image("00990:90900:99999:00909:09900")
fan2 = Image("99009:09099:00900:99090:90099")


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display.show(Image.HEART)
sleep(400)

while True:
    angle = (WOM_Sensor_Kit.WOM_Knob(pin0)/3.76)
    superbit.servo270_V2(superbit.S1, int(angle))
```
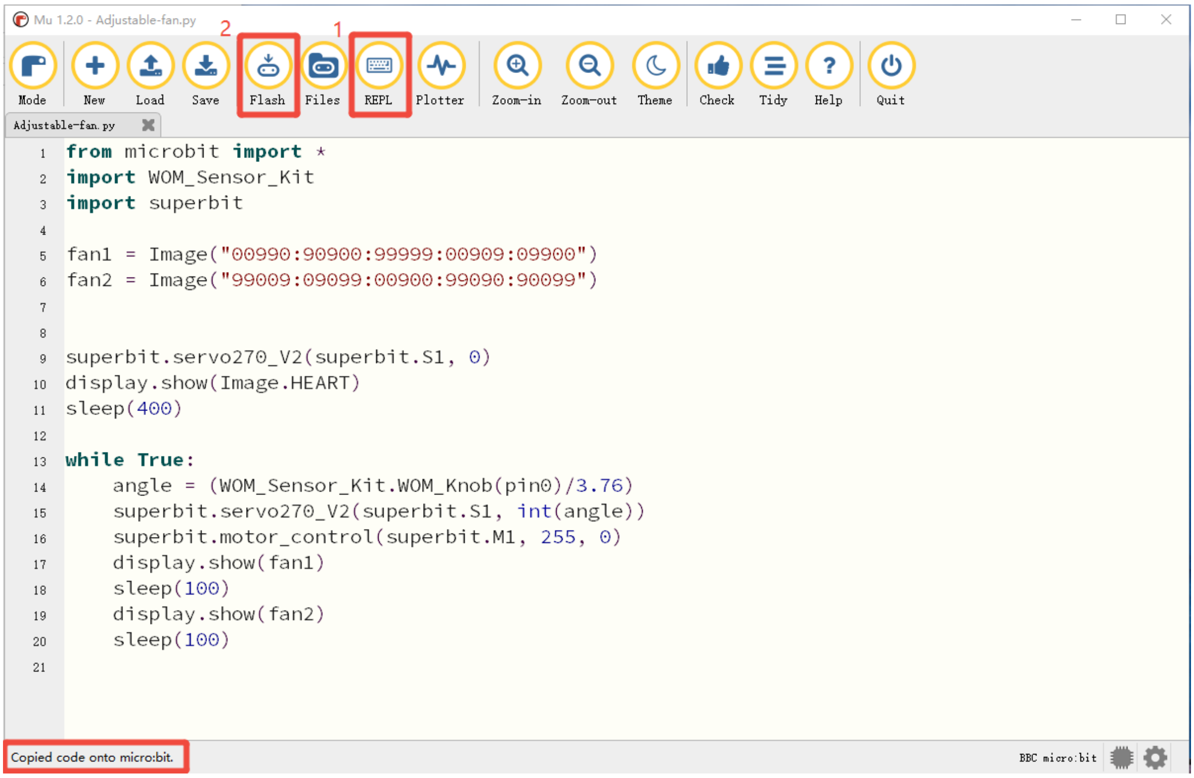

```
MicroPython v1.15-64-g1e2f0d280 on 2025-06-26; SuperbitV2 and Sensor v3.0.0 with modified by Yahboom Team
Type "help()" for more information.
>>>
>>>
```

4. After the program is written, connect the computer and the microbit mainboard with a microUSB data cable, and click the ‘Flash’ button to download the program to the micro:bit mainboard. **(You need to click the ‘REPL’ button again to turn off the import library file function before you can download the program normally).**



```
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    superbit.servo270_V2(superbit.S1, int(angle))
    superbit.motor_control(superbit.M1, 255, 0)
    display.show(fan1)
    sleep(100)
    display.show(fan2)
    sleep(100)
```

Copied code onto micro:bit.

5. If the download fails, please confirm whether the microbit is properly connected to the computer via the microUSB data cable and the Superbit Python library has been imported.

6. Experimental phenomenon

After the program runs successfully, turn on the power switch, a heart pattern will be displayed on the microbit dot matrix, and the adjustable fan will rotate at the maximum speed of 255. Turning the potentiometer can change the angle of the adjustable fan. At the same time, we can see that the microbit dot matrix will display a dynamic windmill rotation pattern.