Adjustable speed fan

Learning goals

In this lesson, we will learn use Python programming to make a shift fan using a super:bit expansion board.

Code:

```
from microbit import *
import music
import superbit
import neopixel

zero = Image("09990:90009:90009:90009:09990")
one = Image("00900:09900:00900:00900:09990")
two = Image("99900:00090:00900:90000:99990")
tree = Image("99990:00090:00900:90090:09900")
four = Image("00990:09090:90090:99999:00090")
five = Image("09999:09000:09990:00009:09990")


flag = 0
superbit.motor_control(superbit.M1, 0, 0)
np = neopixel.NeoPixel(pin12, 4)

def limit():
    global flag
    if flag > 5:
        flag = 5
    elif flag < 0 :
        flag = 0

def change():
    global flag
    if button_a.is_pressed():
        music.play(music.POWER_UP)
        flag = flag + 1
    elif button_b.is_pressed():
        music.play(music.POWER_DOWN)
        flag = flag - 1

while True:
    change()
    limit()
    if flag == 0:
        display.show(zero)
        superbit.motor_control(superbit.M1, 0, 0)
        np.clear()
        np.show()
    elif flag == 1:
        display.show(one)
        superbit.motor_control(superbit.M1, 50, 0)
        np.clear()
        np[0] = (50, 0, 0)
        np[1] = (50, 0, 0)
        np[2] = (50, 0, 0)
        np[3] = (50, 0, 0)
        np.show()
```

```
    elif flag == 2:
        display.show(two)
        superbit.motor_control(superbit.M1, 100,0)
        np.clear()
        np[0] = (100, 0, 0)
        np[1] = (100, 0, 0)
        np[2] = (100, 0, 0)
        np[3] = (100, 0, 0)
        np.show()
    elif flag == 3:
        display.show(tree)
        superbit.motor_control(superbit.M1, 150, 0)
        np.clear()
        np[0] = (150, 0, 0)
        np[1] = (150, 0, 0)
        np[2] = (150, 0, 0)
        np[3] = (150, 0, 0)
        np.show()
    elif flag == 4:
        display.show(four)
        superbit.motor_control(superbit.M1, 200, 0)
        np.clear()
        np[0] = (200, 0, 0)
        np[1] = (200, 0, 0)
        np[2] = (200, 0, 0)
        np[3] = (200, 0, 0)
        np.show()
    elif flag == 5:
        display.show(five)
        superbit.motor_control(superbit.M1, 255, 0)
        np.clear()
        np[0] = (255, 0, 0)
        np[1] = (255, 0, 0)
        np[2] = (255, 0, 0)
        np[3] = (255, 0, 0)
        np.show()

```

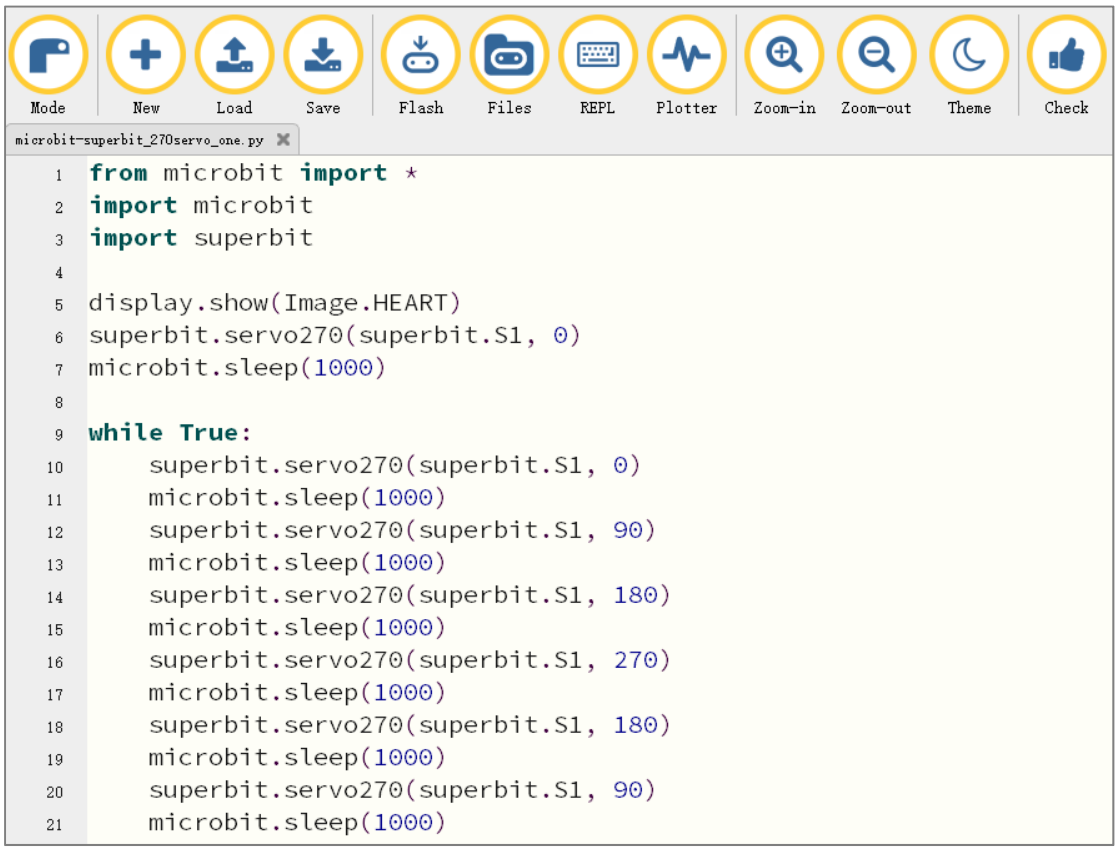
zero-five are custom images. Used to display the number of the corresponding gear on the dot matrix.
limit (): Detect whether the flag variable exceeds the range, we define 0-5 gear
change (): Detect whether the A and B keys are pressed. Press A to increase the speed of the motor and buzzer sound. Press B to decrease the speed of the motor and buzzer sound.

In the loop, the limit and change are continuously called to detect the gear status, and then the corresponding gear is displayed on the micro:bit board using the display.show () function.
The motor speed is changed by superbit.motor_control (), and select the color and brightness of corresponding light by np [ ].
np.show refresh the color.

Programming and downloading：

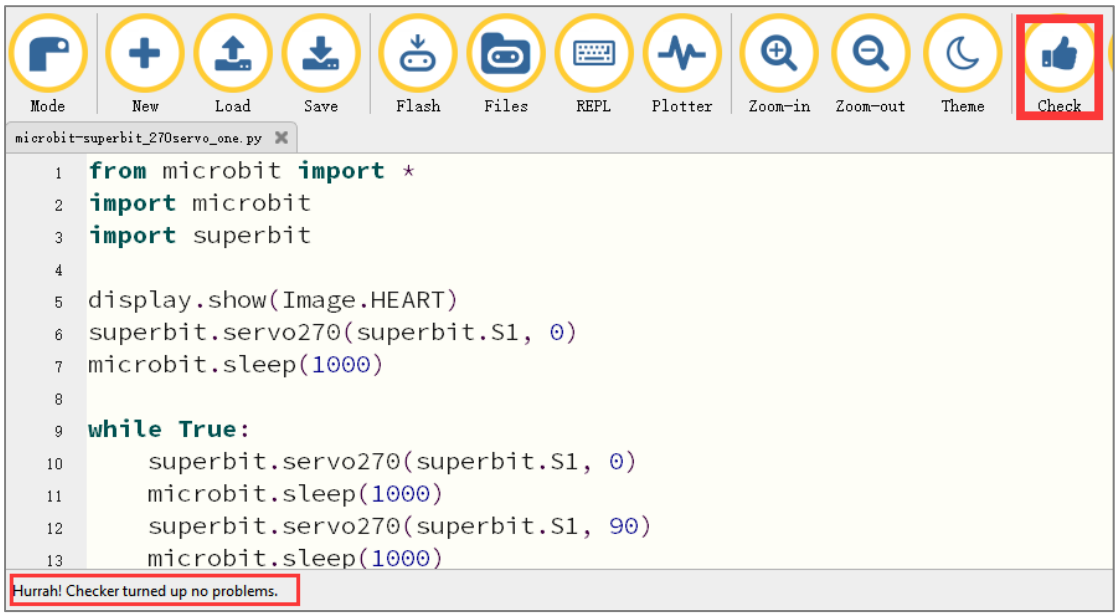
1.You should open the Mu software, and enter the code in the edit window, , as shown below.

Note! All English and symbols should be entered in English, and the last line must be a space.

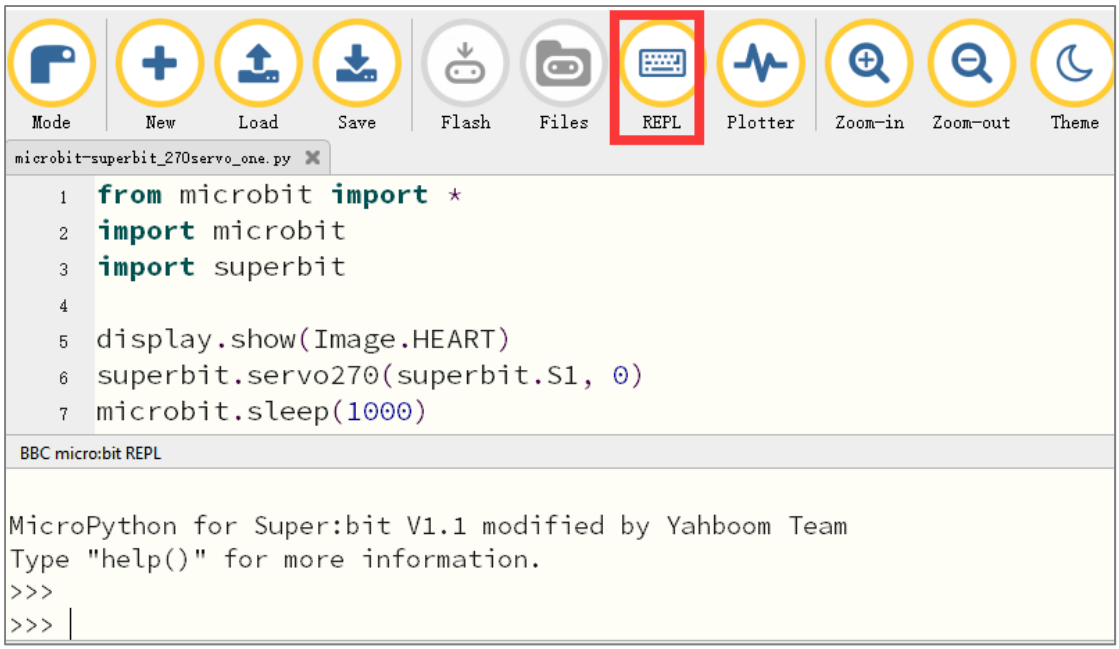



```
from microbit import *
import microbit
import superbit

display.show(Image.HEART)
superbit.servo270(superbit.S1, 0)
microbit.sleep(1000)

while True:
    superbit.servo270(superbit.S1, 0)
    microbit.sleep(1000)
    superbit.servo270(superbit.S1, 90)
    microbit.sleep(1000)
    superbit.servo270(superbit.S1, 180)
    microbit.sleep(1000)
    superbit.servo270(superbit.S1, 270)
    microbit.sleep(1000)
    superbit.servo270(superbit.S1, 180)
    microbit.sleep(1000)
    superbit.servo270(superbit.S1, 90)
    microbit.sleep(1000)
```

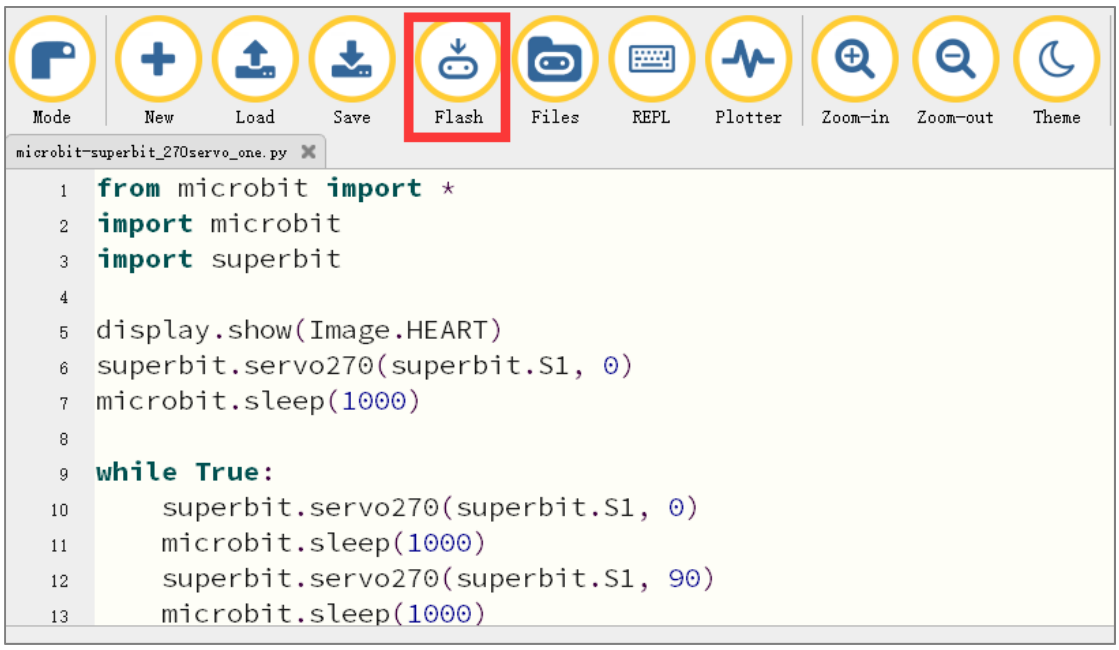
2.You can click the **“Check”** button to check if our code has an error. If a line appears with a cursor or an underscore, the program indicating this line is wrong.



3.Click the 'REPL' button to check whether the super:bit library has been downloaded. If not, please refer to the [preparation before class] ---> [2.How to import Yahboom superbit library] import super:bit library tutorial.



4.After writing the code, please click the ‘Flash’ button to download the program to the micro:bit board.



If the program is wrong or the experimental phenomenon is wrong after downloading, please confirm whether you have downloaded the superbit library hex file we provided to the micro: bit board.
For the specific method of adding library files, please refer to 【1.Preparation before class】---【How to import Yahboom superbit library】

Hardware connection

The 270° block servo connect to the S1 interface of the Super:bit expansion board. The orange wire of the 270° block servo is connected to the yellow pin of S1, the red wire of the 270° block servo is connected to the red pin of S1, and the brown wire of the 270° block servo is connected to the black pin of S1.

Experimental phenomena

After the download is complete, 0 is displayed on the micro:bit dot matrix, and the motor speed is adjusted by pressing A and B. With the sound of the buzzer, the 0-speed motor stop, and the 5-speed motor is the fastest.