Sailing Prelude

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1. Learning Objectives

In this course, we mainly learn how to use Python programming to make the helicopter propeller rotate while the buzzer plays music.

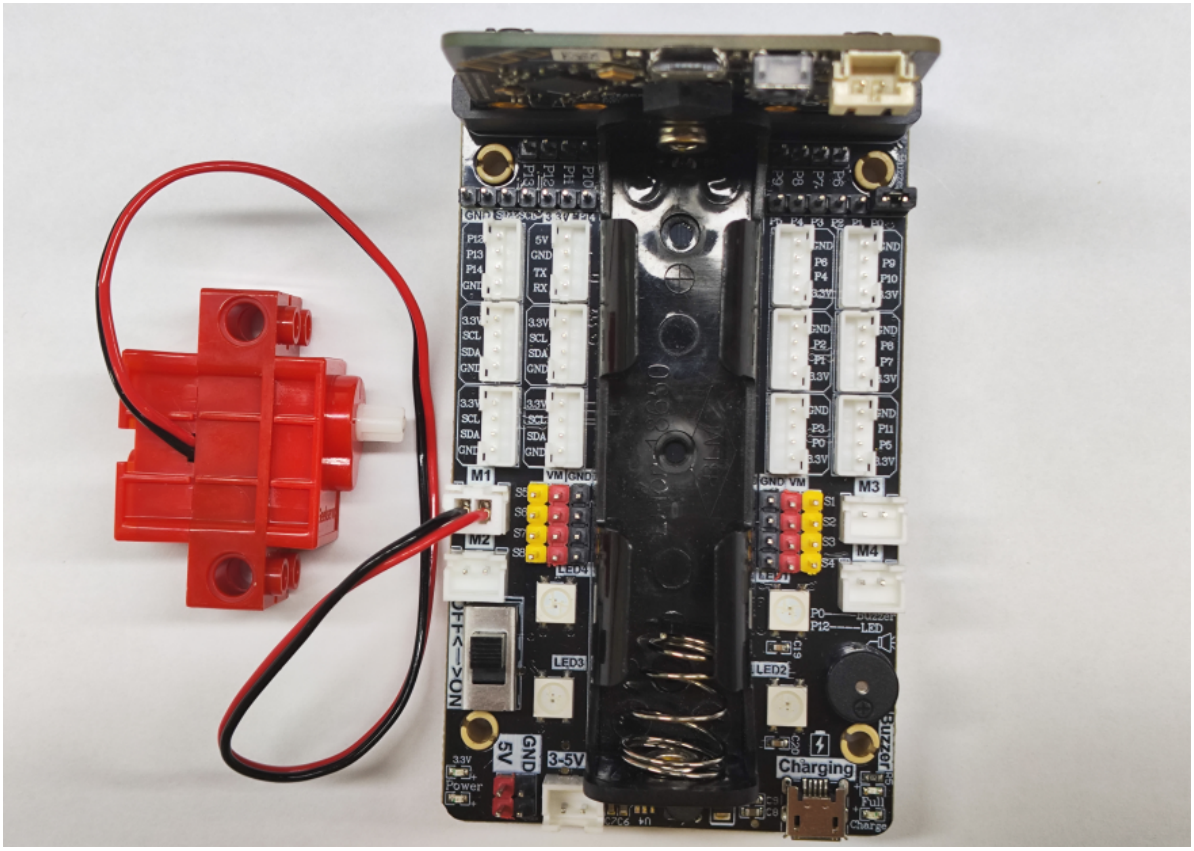
2. Building Blocks

For the building block steps, please refer to the installation drawings of [Assembly course]-[Airplane] in the materials or the building block installation album.

3. Motor Wiring

Insert the motor wiring on the left side of the car into the M1 interface of the Super:bit expansion board, with the black wire close to the battery side;

As shown in the figure below:



4. Code Analysis

For the program of this course, please refer to the **Airplane code.py** file.

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

First, import the libraries needed for this lesson from microbit: the superbit library is dedicated to the superbit expansion board; the music library is used to play music; and the neopixel is used to control the RGB light.

```
airplane = Image("00090:09090:99999:09090:00090")
display.show(airplane)
np = neopixel.NeoPixel(pin12, 4)
```

airplane = Image("00090:09090:99999:09090:00090"): Custom airplane pattern

display.show(airplane): Display airplane pattern on microbit dot matrix;

np = neopixel.NeoPixel(pin12, 4): RGB light initialization setting, there are 4 RGB lights, connected to the P12 pin of microbit motherboard (check the hardware interface manual);

```
while True:
music.play('E4:4')
superbit.motor_control(superbit.M1, 255, 0)
np[0] = (255, 0, 0)
np.show()
...
```

while True: infinite loop

music.play('E4:4'): The buzzer plays a tone. Parameter 1 E4 represents the tone, and parameter 2 4 represents the beat.

superbit.motor_control(superbit.M1, 255, 0): The motor connected to the M1 interface rotates forward at a speed of 255;

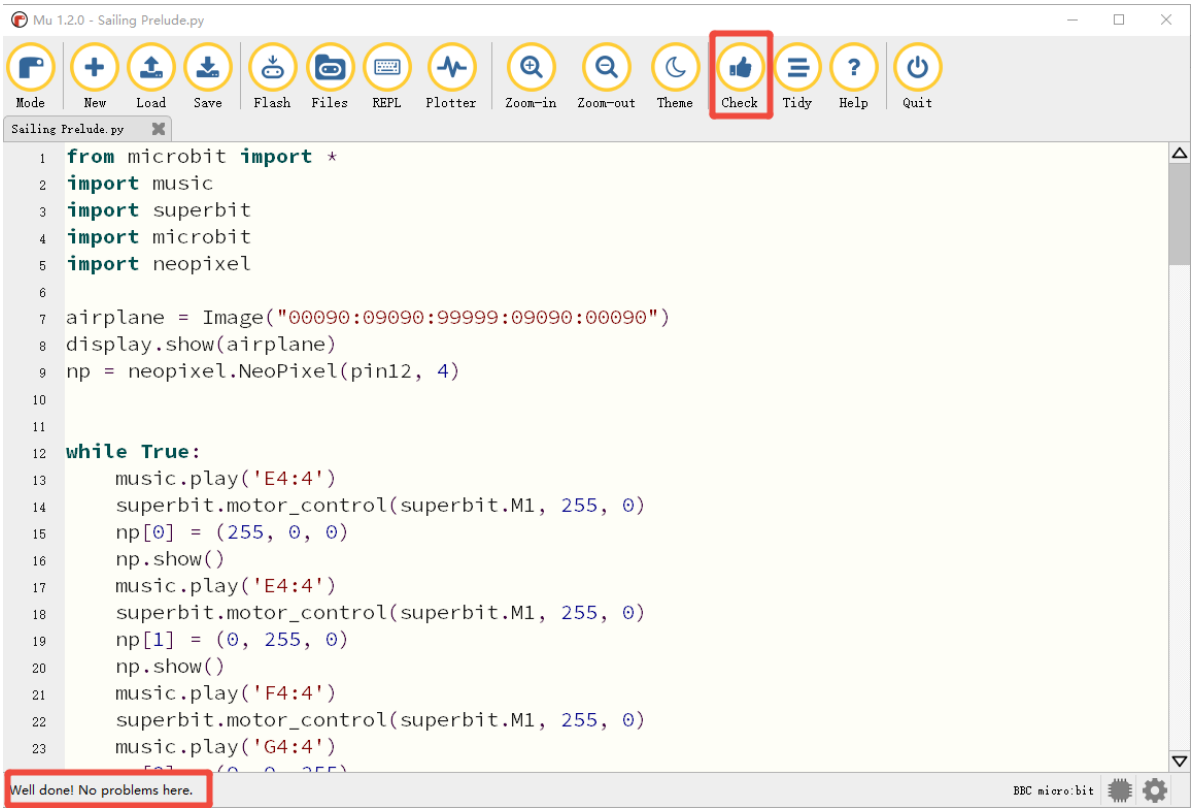
np[0] = (255, 0, 0)

np.show(): The first RGB light turns red.

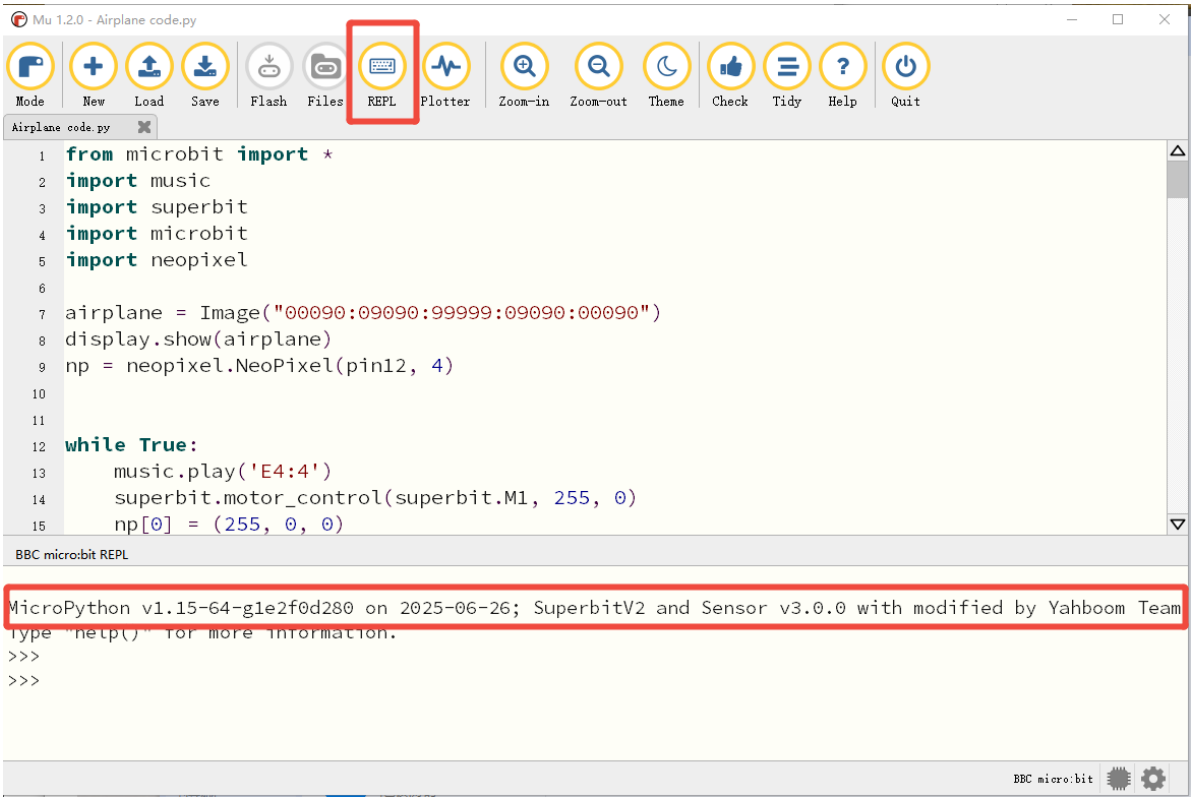
Repeat this loop.

5. Write and download the program

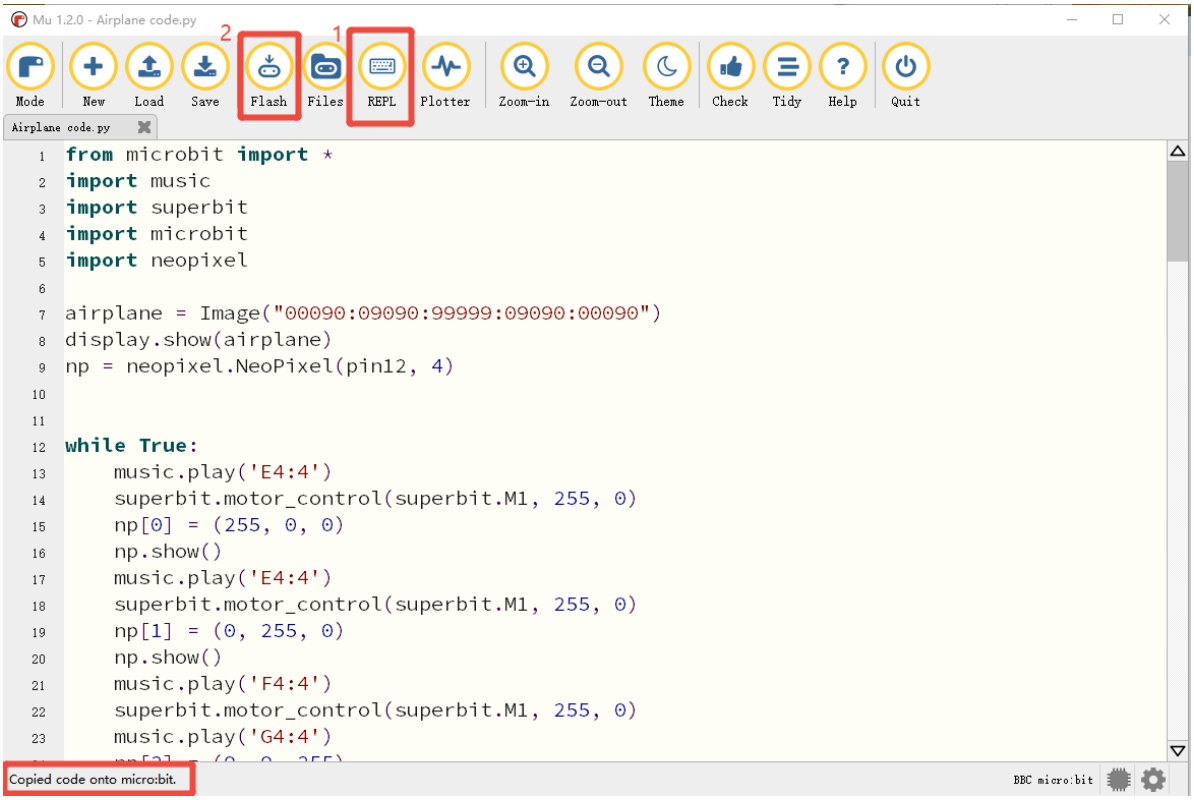
1. Open the Mu software and enter the code in the editing window. **Note! All English and symbols should be entered in English mode, use the Tab key (tab key) for indentation, and the last line ends with a blank program.**
2. Click the thumb 'Check' button to check if there are any errors in our code. If a cursor or underline appears on 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.



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].



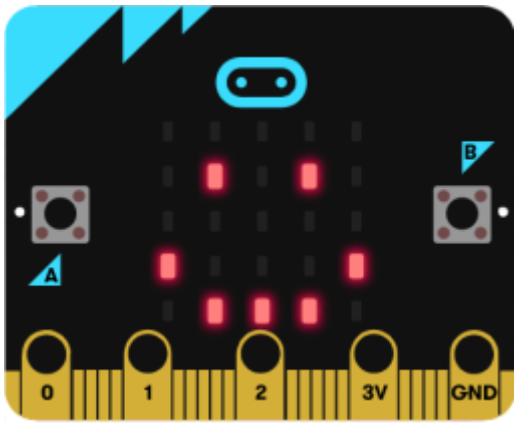
4. After the program is written, connect the computer and the microbit mainboard with a microUSB data cable. Please click the 'Flash' button to download the program to the micro:bit mainboard. **(You need to click the 'REPL' button again to turn off the import library file function before you can download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



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 is successfully downloaded, turn on the power switch, and a smiley face pattern will be displayed on the micro:bit dot matrix, as shown in the figure below. Then, the propeller of the helicopter starts to rotate, the buzzer starts to play the music "Ode to Joy", and RGB will also switch to different colors.



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