RGB light effect

Learning goals

In this lesson, we will learn to control the RGB light display effects on the tumble:bit car, such as, marquee lights and following lights by Python programming.

Code

Marquee code:

```
from microbit import *
import neopixel
import microbit
Red = (255, 0, 0)
Orange = (255, 165, 0)
Yellow = (255, 255, 0)
Green = (0, 255, 0)
Blue = (0, 0, 255)
Violet = (148, 0, 211)
White = (255, 255, 255)
color_lib = {
        'Red': Red, 'Orange': Orange, 'Yellow': Yellow, 'Green': Green,
        'Blue': Blue, 'Violet': Violet, 'White': White
        }
# Function is used to set a single RGB light to a certain color,
# parameter num: set the actual position of the light (0-3)
# Parameter color: Set the color of the light.
# The color tuples in the color_lib dictionary are also defined.
def RGBLight_show(num, color):
    global np
    np[num] = color_lib[color]

np = neopixel.NeoPixel(pin12, 4)
display.show(Image.HEART)
while True:
    np.clear()
    RGBLight_show(0, 'Violet')
    RGBLight_show(1, 'Red')
    RGBLight_show(2, 'Green')
    RGBLight_show(3, 'Blue')
    np.show()
    microbit.sleep(100)
    np.clear()
```

```
    RGBLight_show(0, 'Blue')
    RGBLight_show(1, 'Violet')
    RGBLight_show(2, 'Red')
    RGBLight_show(3, 'Green')
    np.show()
    microbit.sleep(100)
    np.clear()
    RGBLight_show(0, 'Green')
    RGBLight_show(1, 'Blue')
    RGBLight_show(2, 'Violet')
    RGBLight_show(3, 'Red')
    np.show()
    microbit.sleep(100)
    np.clear()
    RGBLight_show(0, 'Red')
    RGBLight_show(1, 'Green')
    RGBLight_show(2, 'Blue')
    RGBLight_show(3, 'Violet')
    np.show()
    microbit.sleep(100)

```

from microbit import * is to import everything from the micro:bit library. Every program that uses micro:bit must import this library. We also need to import the neopixel library for RGB lights and the micro:bit library.
The corresponding RGB values of each color, such as red, orange, yellow, green, blue, purple, and white, can be found online.
Define a tuple that contains the previously defined color RGB tuples, and then extract the pair colors by index.

RGBLight_show (num, color): set a single RGB light to light a certain color, num is the number of RGB light, and color is the color;
display.show (Image.HEART): micro:bit dot matrix display heart;
np = neopixel.NeoPixel (pin12, 4): Initialize the RGB programming light library; The first parameter is the pins of the RGB light, and the second parameter is the number of RGB lights;
np.clear (): Clear RGB light display;
np.show (): refresh the colorful lights display, if you do not run this function, the above setting color will not work;
microbit.sleep (100): Delay 100 milliseconds.
By continuously using the RGBLight_show function to change the color of RGB lights 0-3 in the loop, the micro:bit.sleep function sets the change time to achieve the marquee special effect.

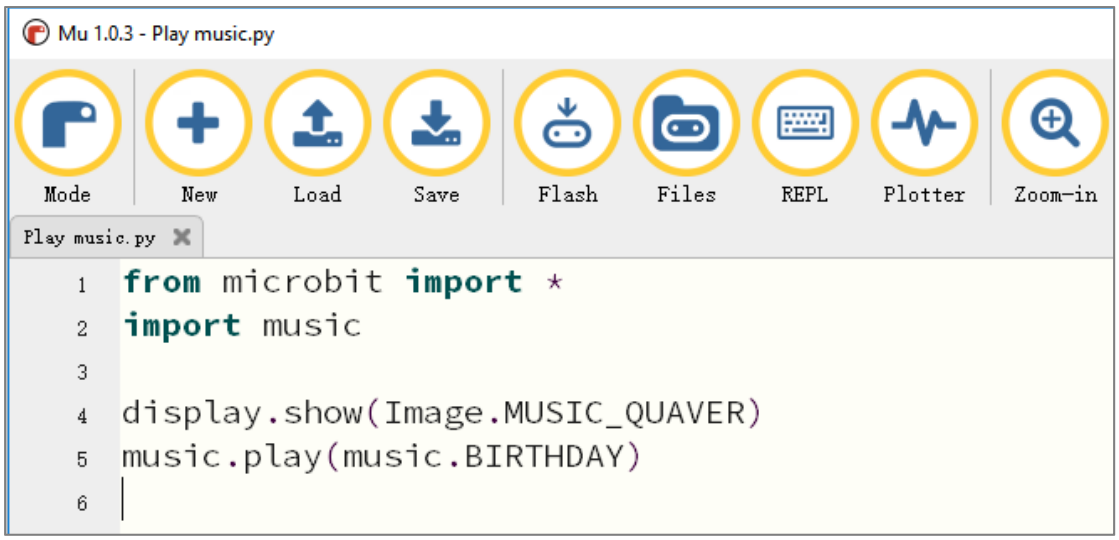
Following lights code:

The function of the following light is the same as the function of the marquee light, but only the four lights are changed to one in the loop, and the position changes continuously and only purple color.

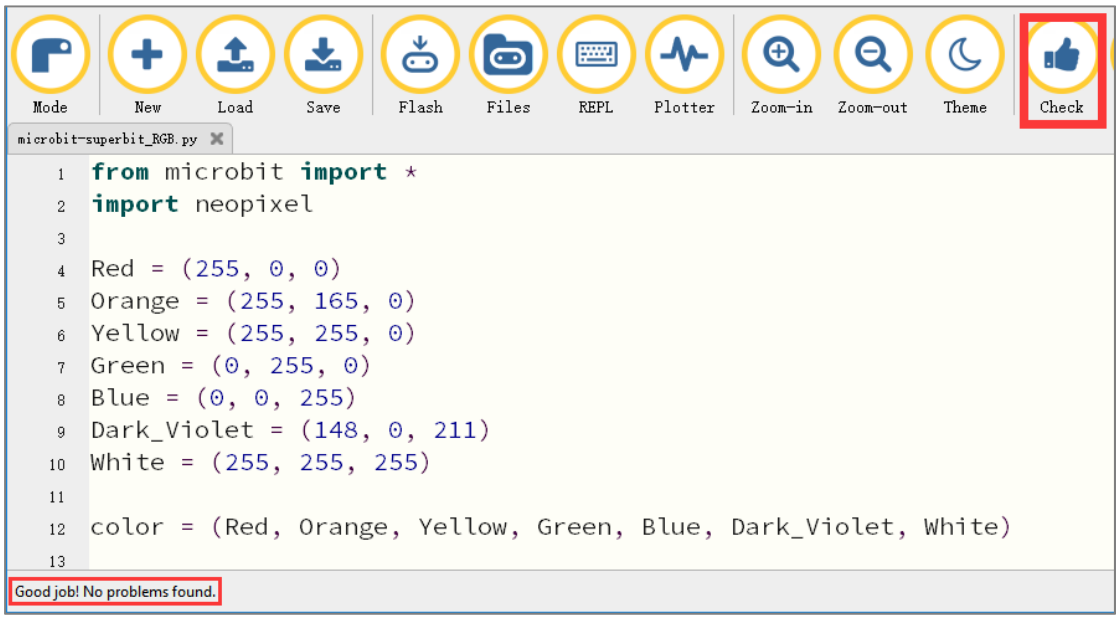
Programming and downloading：

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

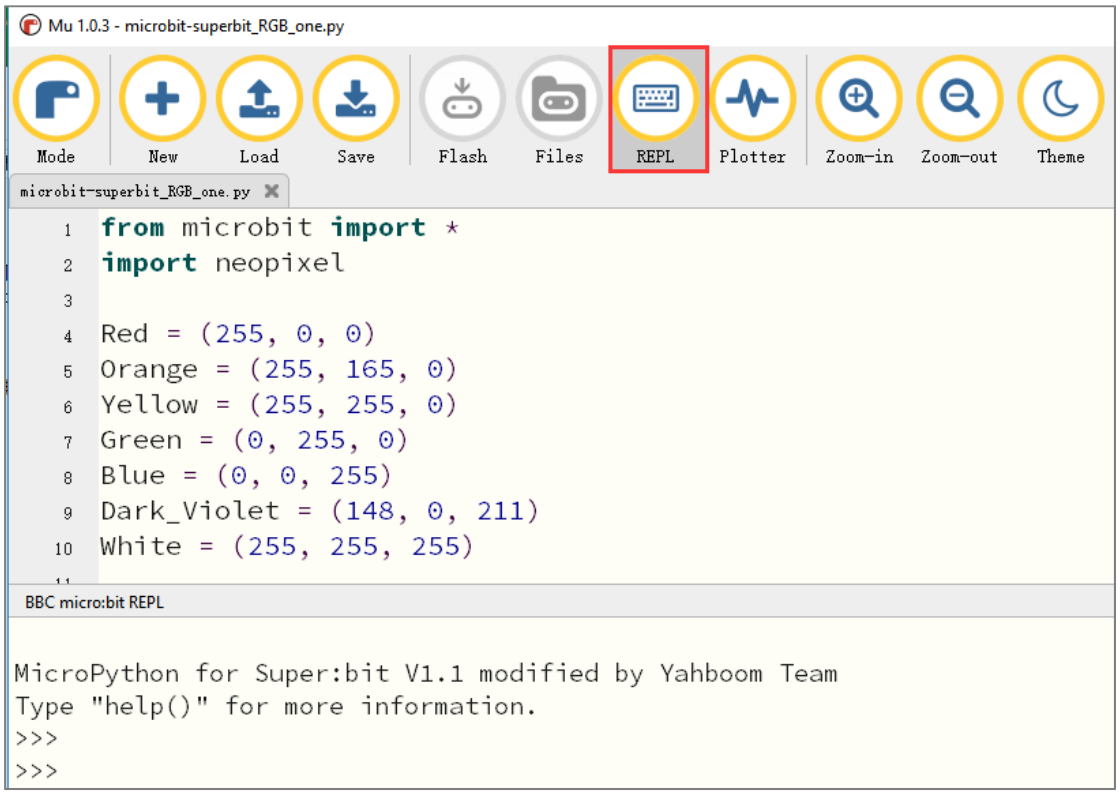
Note! All English and symbols should be entered in English, and the last line must be a space.



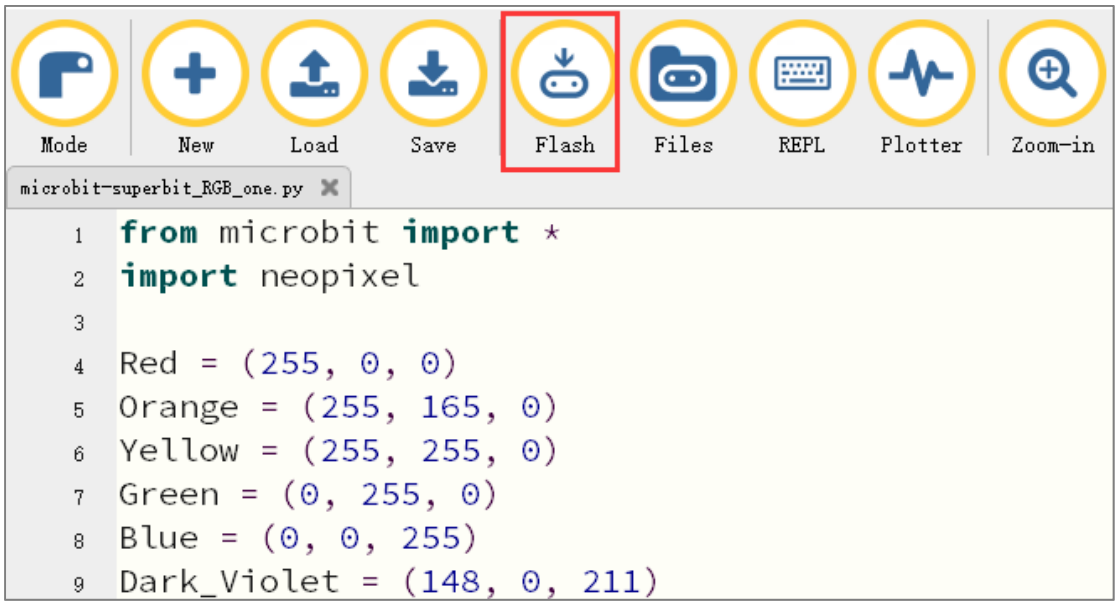
2.You can click the **"Check"** button to check if our code has an error. If a line appears with a cursor or an underscore, the program indicating this line is wrong.



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】---【About Python programming】

Experimental phenomenon

After the tumble:bit car is powered on, the micro:bit dot matrix will display heart and control the color of RGB lights.

Code 1 (Following lights): No.1 RGB lights up in purple, it will off after 0.1 seconds and No.2 RGB lights up in purple, and so on. It shows the special effects of following lights.

Program 2 (Marquee): The four colors of purple, red, green, and blue are cycled on the four RGB lights to display the marquee effect.

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