3.Alarm Clock

1. Learning goals

In this lesson, we will learn to use micro:bit and Wrist:bit make a smart alarm clock based on light intensity.

2.Code and analysis

```python
1   from microbit import *
2   import music
3
4
5   sun = Image("90909:"
6                "09990:"
7                "99999:"
8                "09990:"
9                "90909")
10
11  moon = Image("00990:"
12                "09900:"
13                "09900:"
14                "09900:"
15                "00990")
16
17
18  while True:
19      value = display.read_light_level()
20      if value < 20:
21          pin2.write_analog(0)
22          display.show(moon)
23          music.stop()
24      else:
25          pin2.write_analog(536)
26          display.show(sun)
27          music.play(music.ENTERTAINER)
28      value = 0
29
```

from microbit import *
This code is to import everything from the microbit library, and any program need to uses import this library.
import music: Import music library.

display.read_light_level(): We can use the LED light of microbit dot matrix to sense the brightness falling on the dot matrix. Returns an integer between 0 and 255.
music.stop(): Stop all music.

In this course, we can detects the brightness of the external environment by LED dot matrix.
When the brightness exceeds 20, the micro:bit dot matrix displays the sun pattern, the vibration motor of the watch rotates to cause vibration, and the buzzer plays music.
When the brightness is lower than 20, all peripherals stop and the micro:bit dot matrix displays the moon pattern.
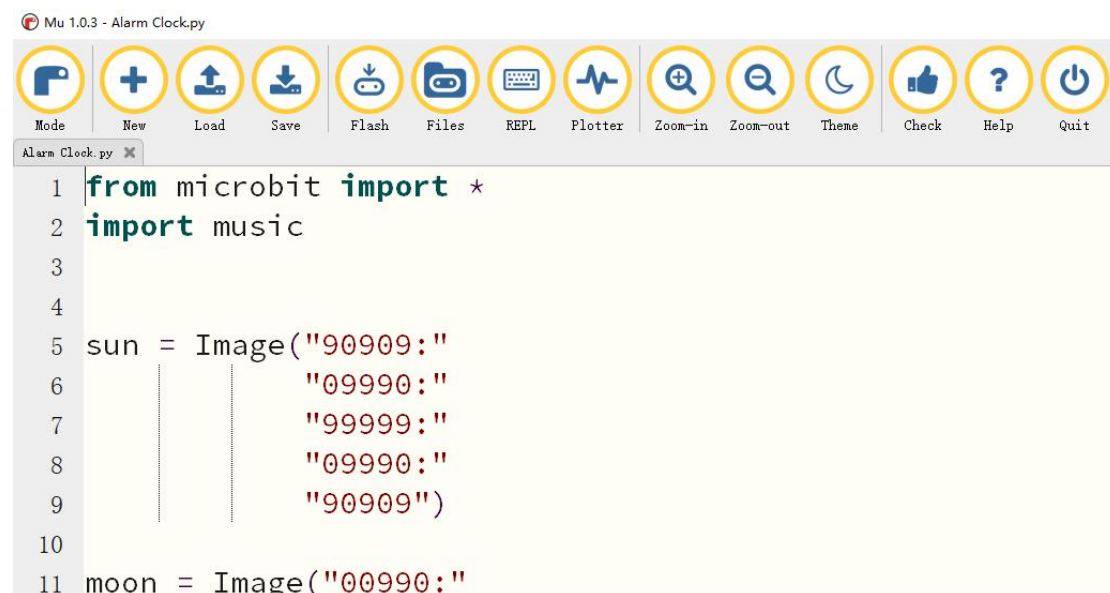
Note:
1 - The capital letter/lowercase letters must be distinguished！
2 - Correct spelling!
3 - Keywords such as # need a space between the content.
4 - You can only use the Tab key (tabulation key) for indentation.

3. Programming and downloading

3.1 You should open the Mu software, and enter the code in the edit window, , as shown in figure .
Note! All English and symbols should be entered in English, and the last line must be a space.


```python
from microbit import *
import music


sun = Image("90909:"
            "09990:"
            "99999:"
            "09990:"
            "90909")

moon = Image("00990:"
```

3.2 As shown in Figure, you need to 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.
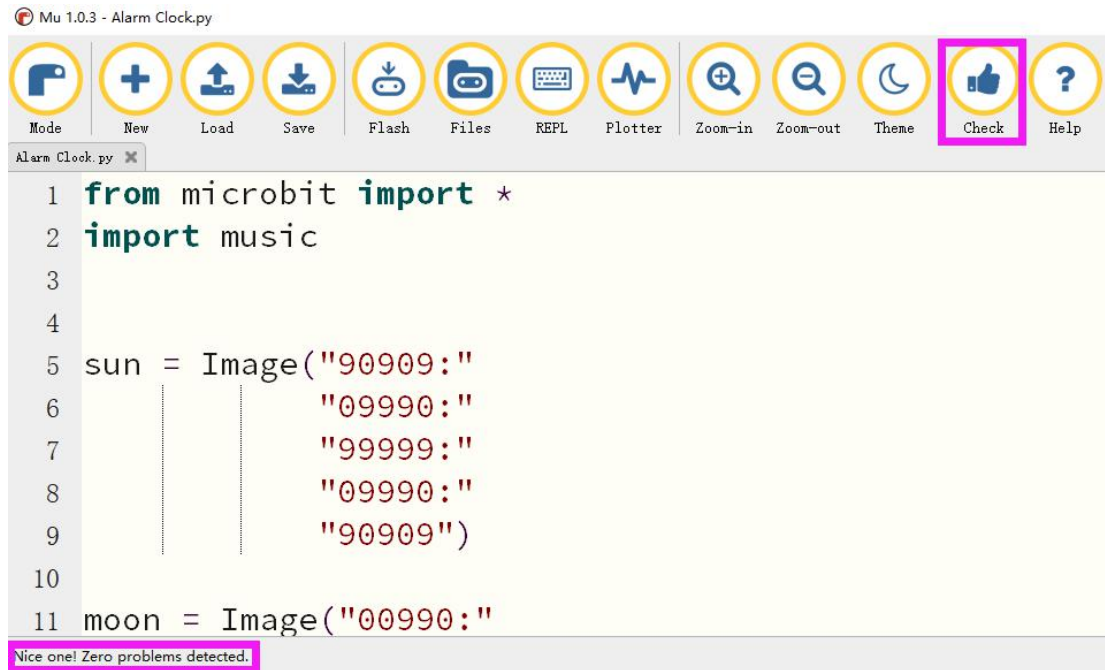
3.3 You need to connect the micro data cable to micro:bit and the computer, then click the Flash button to download the program to micro:bit .
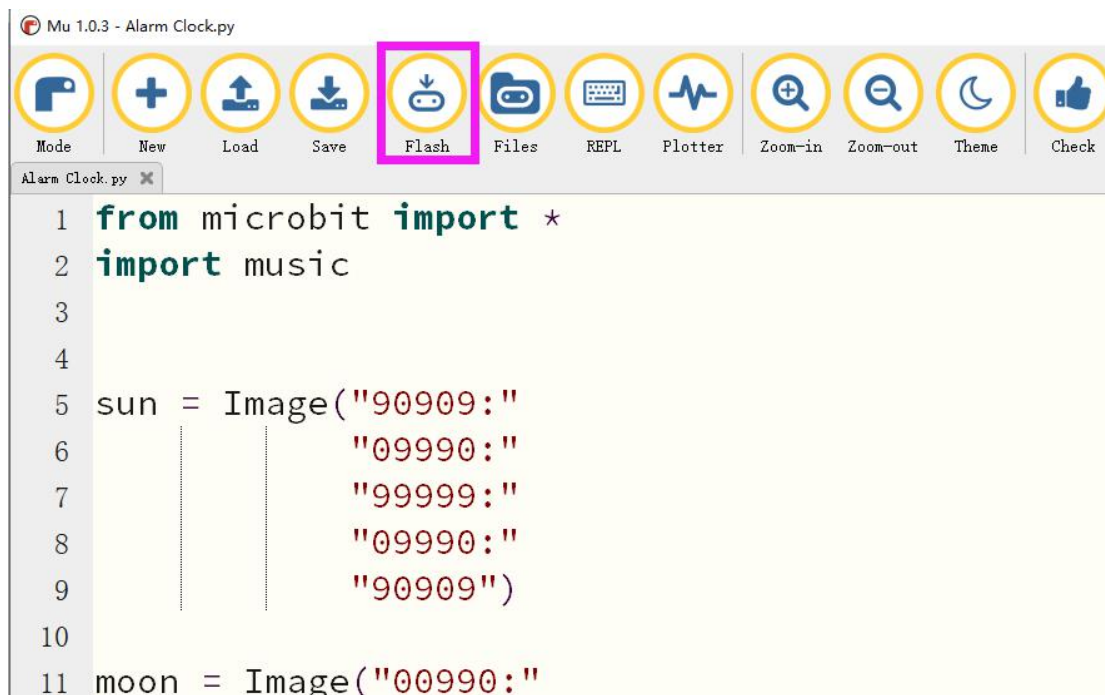
4. Experimental phenomena

After the program is successfully downloaded.

When the brightness of the environment is relatively large, the micro:bit dot matrix displays the sun pattern, and the birthday song and vibration will be played at the same time.

When the environment is relatively dark, the micro:bit dot matrix will display the moon pattern. At this time, the music is closed and the vibration stops.