5.Direction follower

1. Learning goals

In this lesson, we will learn to use micro:bit to make a simple compass (compass).

2.Code and analysis

```
1  from microbit import *
2
3  compass.calibrate()
4
5  while not compass.is_calibrated():
6      pass
7
8  while True:
9      azimuth = compass.heading()
10     if azimuth >= 0 and azimuth < 45:
11         display.show(Image.ARROW_NW)
12     elif azimuth >= 45 and azimuth < 90:
13         display.show(Image.ARROW_W)
14     elif azimuth >= 90 and azimuth < 135:
15         display.show(Image.ARROW_SW)
16     elif azimuth >= 135 and azimuth < 180:
17         display.show(Image.ARROW_S)
18     elif azimuth >= 180 and azimuth < 225:
19         display.show(Image.ARROW_SE)
20     elif azimuth >= 225 and azimuth < 270:
21         display.show(Image.ARROW_E)
22     elif azimuth >= 270 and azimuth < 315:
23         display.show(Image.ARROW_NE)
24     elif azimuth >= 315 and azimuth < 360:
25         display.show(Image.ARROW_N)
26
```

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

compass.is_calibrated()
If the compass has been successfully calibrated, returns True, otherwise returns False.

compass.heading()

According to the book calculation, the compass direction is an integer between 0 and 360, the unit is degree, the direction is clockwise, and north corresponds to 0 °.
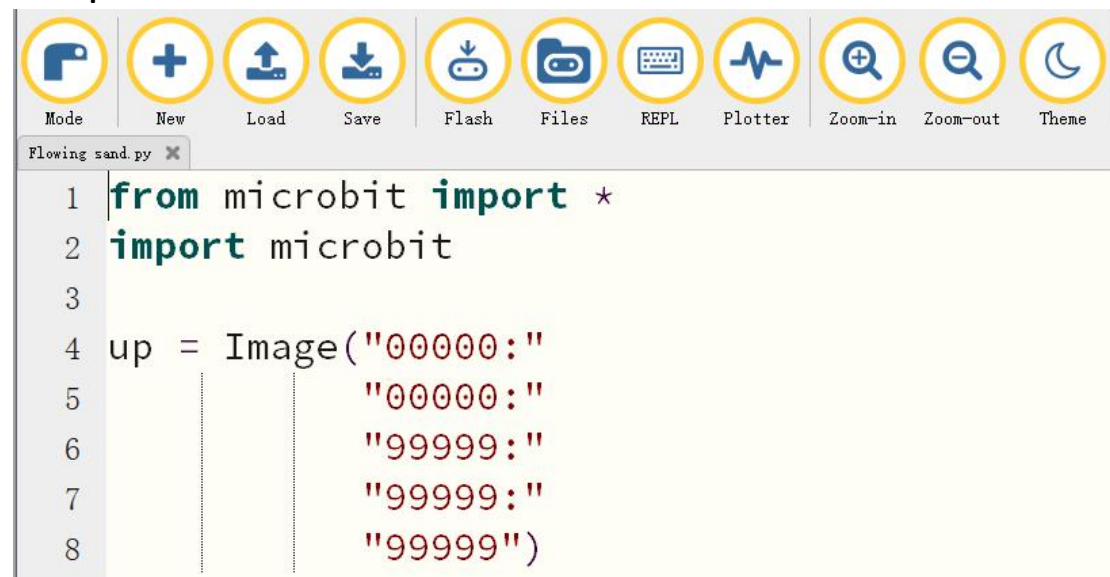
Note:
1 - The capital letter/lowercase letters must be distinguished！
2 - Correct spelling!
3 - Keywords such as # need a space between the content.
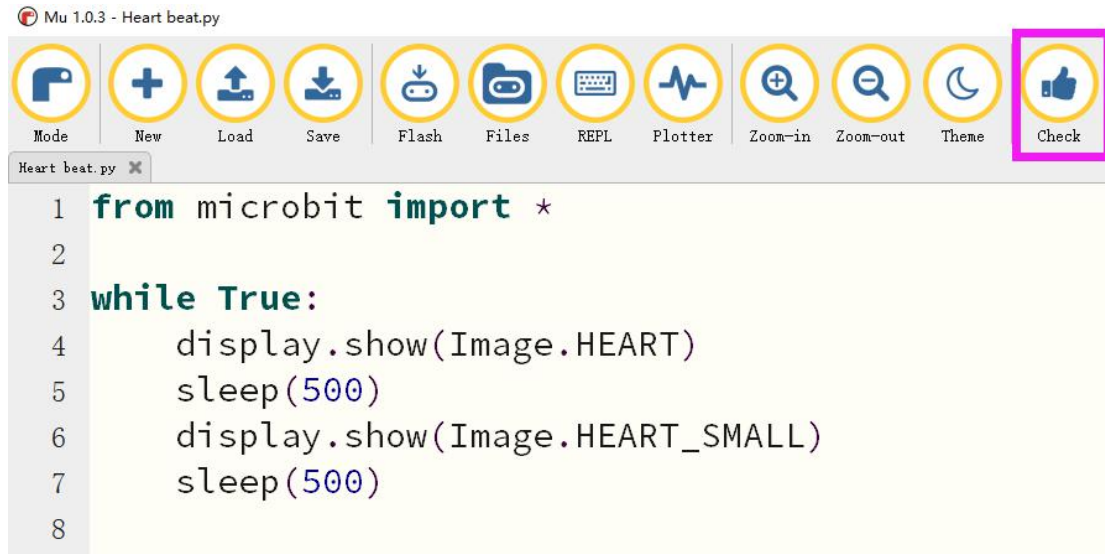4 - You can only use the Tab key (tabulation key) for indentation.

3. Programming and downloading

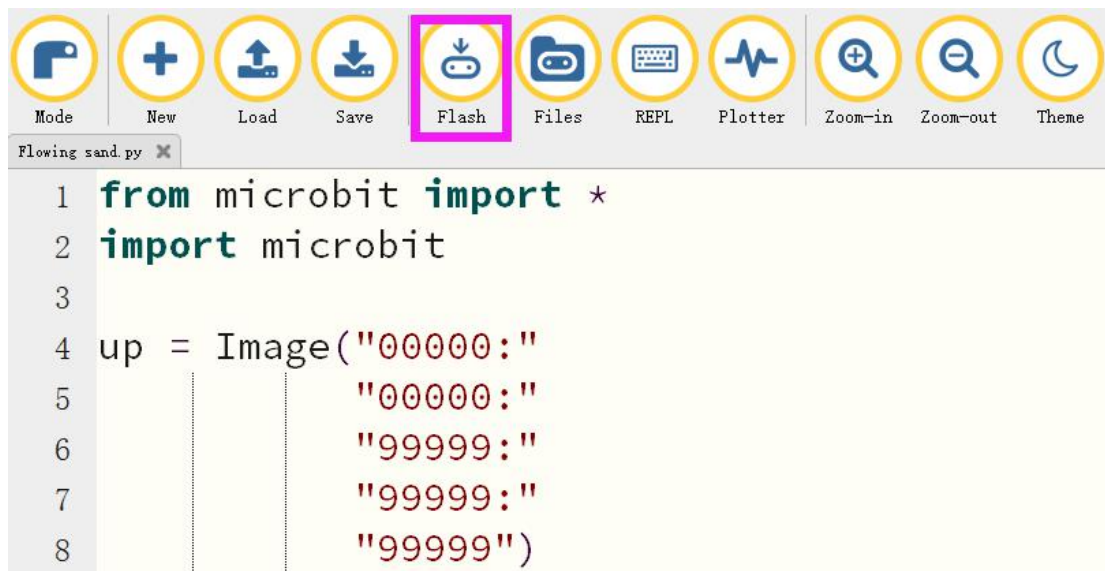3.1 You should open the Mu software, and enter the code in the edit window, , as shown in Figure .

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

```python
from microbit import *
import microbit

up = Image("00000:"
            "00000:"
            "99999:"
            "99999:"
            "99999")
```

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.

```
1  from microbit import *
2
3  while True:
4      display.show(Image.HEART)
5      sleep(500)
6      display.show(Image.HEART_SMALL)
7      sleep(500)
8
```

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 as shown in Figure 2-3.


```
1  from microbit import *
2  import microbit
3
4  up = Image("00000:"
5             "00000:"
6             "99999:"
7             "99999:"
8             "99999")
```

4. Experimental phenomena

After the program is successfully downloaded,

You can move the micro:bit board in eight different directions to the east, west, south, north, northeast, northwest, southeast, and southwest. No matter which direction the micro:bit swings, the pointer above the dot matrix will point in one direction.