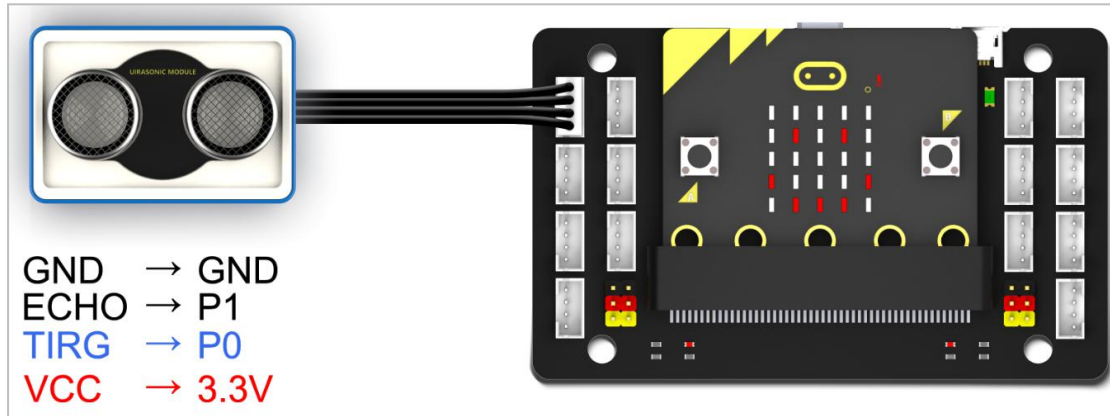## Ultrasonic ranging

### 1.Learning target

In this course, we will learn how to use Micro:bit and ultrasonic module to achieve ranging function.

### 2. Preparation

Connect the module to Micro:bit board by expansion board, as shown below.



```
GND   → GND
ECHO  → P1
TIRG  → P0
VCC   → 3.3V
```

### 3. About code

```
# -*- coding: utf-8-*-# Encoding cookie added by Mu Editor
from microbit import *
import WOM_Sensor_Kit

while True:
    # Parameter definition: WOM_ultrasonic(Echo,Trig)
    display.scroll(WOM_Sensor_Kit.WOM_ultrasonic(pin1, pin0))
    sleep(100)
```

1) from microbit import * means to import all library files from the microbit library. This statement is required for every program when using the microbit.

2) import WOM_Sensor_Kit means to import the library of the magic block world. This library must be imported when using the related functions of the magic block world.

3) while True: means is that infinite loop.

4) display.scroll(WOM_Sensor_Kit.WOM_ultrasonic(pin1, pin0)) Scrolling display of ultrasonic distance on Micro:bit dot matrix.
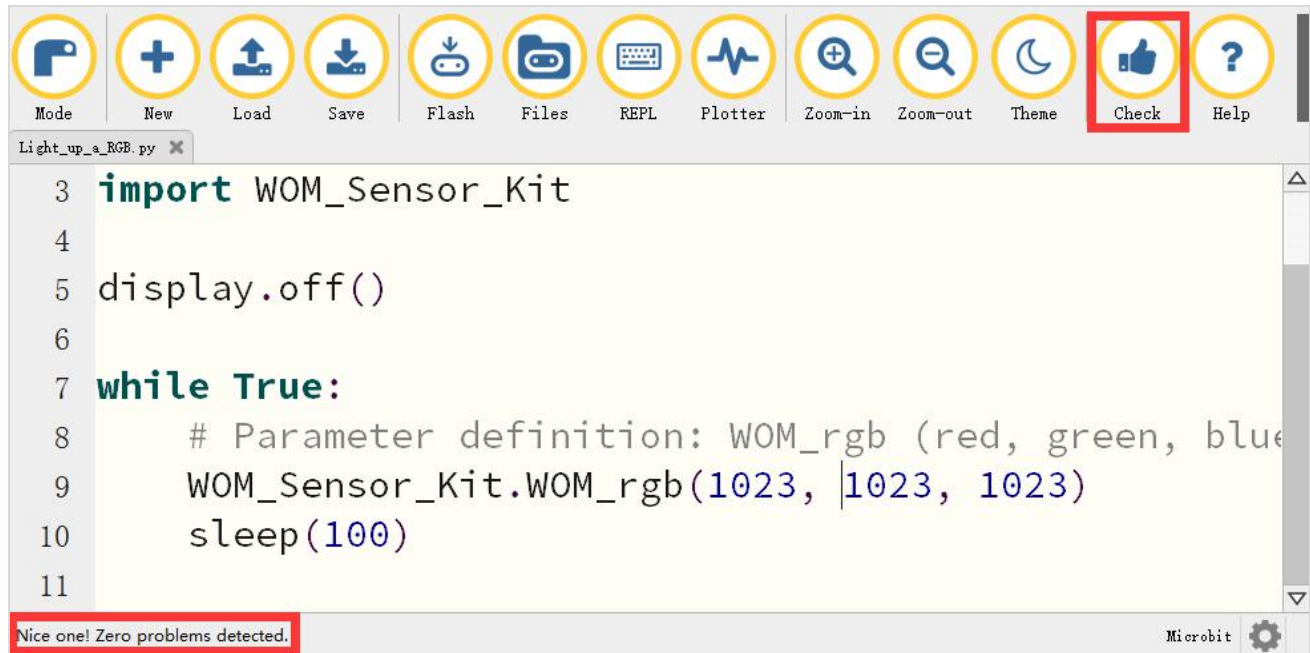
5) sleep(100) Delay 100ms.

## 4.Writing and download code

4.1 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, use the Tab key (tab key) to indent and the last line must be a space.**
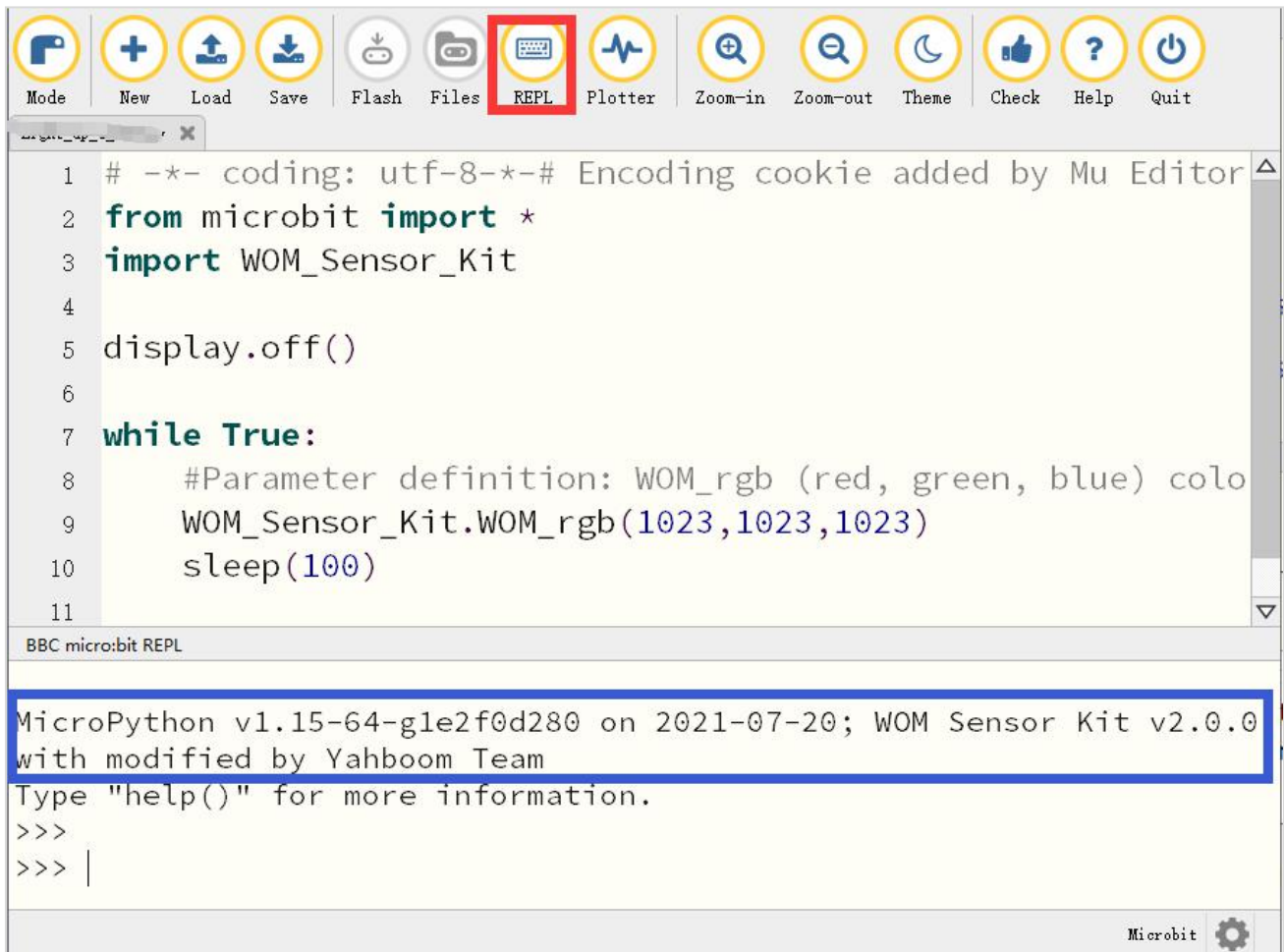
4.2 You can click the "Check" button to check if our code has an error.

If a cursor or underline appears on a line, it indicates a syntax error, please check and modify. If there is no error in the program, the bottom left of the interface will prompt that there is no problem in detection.



```python
3  import WOM_Sensor_Kit
4
5  display.off()
6
7  while True:
8      # Parameter definition: WOM_rgb (red, green, blue
9      WOM_Sensor_Kit.WOM_rgb(1023, 1023, 1023)
10     sleep(100)
11
```

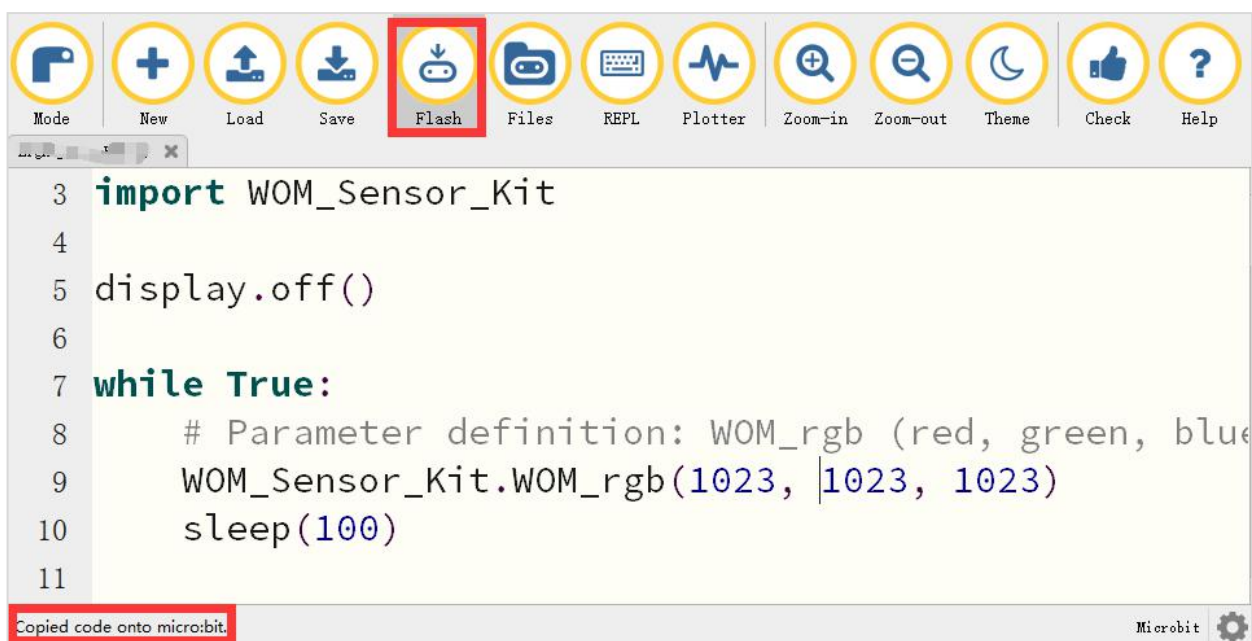Nice one! Zero problems detected.                                    Microbit

4.3 Click the 'REPL' button to check whether the WOM_Sensor_Kit Python library has been downloaded.

If not, please refer to [Preparation before class] --> [Python Programming Guide] .

```
1   # -*- coding: utf-8-*-# Encoding cookie added by Mu Editor
2   from microbit import *
3   import WOM_Sensor_Kit
4
5   display.off()
6
7   while True:
8       #Parameter definition: WOM_rgb (red, green, blue) colo
9       WOM_Sensor_Kit.WOM_rgb(1023,1023,1023)
10      sleep(100)
11
```

BBC micro:bit REPL

```
MicroPython v1.15-64-g1e2f0d280 on 2021-07-20; WOM Sensor Kit v2.0.0
with modified by Yahboom Team
Type "help()" for more information.
>>>
>>>
```

Microbit

4.4 After the program is written, use a micro USB cable to connect the computer and the micro:bit board. Please click the 'Flash' button to download the program to the micro:bit motherboard (You need to click the 'REPL' button again to close the function of importing library files before you download the program).



```
3   import WOM_Sensor_Kit
4
5   display.off()
6
7   while True:
8       # Parameter definition: WOM_rgb (red, green, blue
9       WOM_Sensor_Kit.WOM_rgb(1023, 1023, 1023)
10      sleep(100)
11
```

Copied code onto micro:bit.                                   Microbit

4.5 If the download failed, please confirm whether the micro:bit is connected to the computer through the micro USB data cable, and confirm whether the **WOM_Sensor_Kit Python library** has been imported.

**5. Phenomenon**

After the program is downloaded successfully. Micro:bit dot matrix will display distance data value.