

Button control shovel

1.Learning goals

In this course, we mainly learn how to achieve following function by MakeCode graphical programming.

Function: When the A button on the micro:bit board is pressed, the shovel will lay flat; when the B button on the micro:bit board is pressed, the shovel will unload; when simultaneously press A and B button on the micro:bit board, the shovel will raise.

2.Building block assembly steps

For the building block construction steps, please refer to the installation manual or building block installation picture of [Assembly course]-[Proficient carrier].

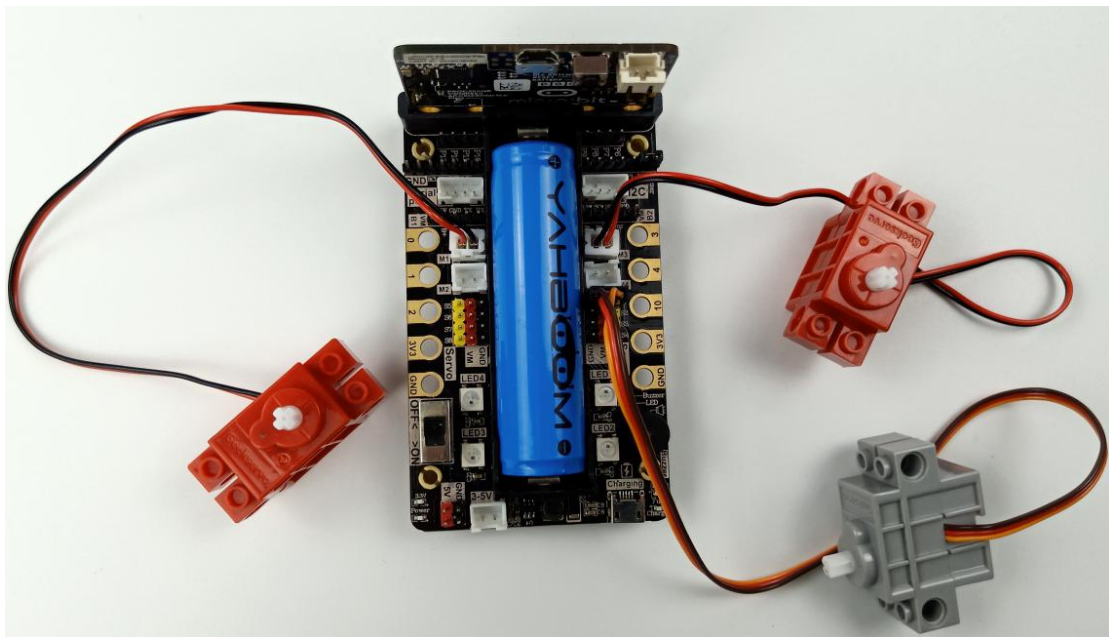
3.Wiring of motor and servo

The motor wiring on the left side of the car is inserted into the M1 interface of the Super:bit expansion board, and the black wire is close to the battery side;

The motor wiring on the right side of the car is inserted into the M3 interface of the Super:bit expansion board, and the black wire is close to the battery side;

Building block servo insert into the Super: bit expansion board S1 interface, and the orange wiring connect the yellow pin of S1.

As shown below:



Note:

For the first course related to building block servo, we need to remove the gear on the servo and upload the program of this course to micro: bit. Then, turn on the power switch of the Super:bit expansion board and wait for the building block servo turn to the initial position. Next, we can turn off the power, and adjust the shovel angle of the car parallel to the ground. Finally, install the servo. (If you have used programs related to clip robot before, you can skip this step)

4.Code and analysis

The car program for this course, please view .py file.

```

1 from microbit import *
2 import superbit
3 import microbit
4 display.show(Image.HAPPY)
5 superbit.servo270(superbit.S1, 120)
6 while True:
7     if button_a.is_pressed() is True and button_b.is_pressed() is False:
8         superbit.servo270(superbit.S1, 120)
9     elif button_a.is_pressed() is False and button_b.is_pressed() is True:
10        superbit.servo270(superbit.S1, 60)
11    elif button_a.is_pressed() is True and button_b.is_pressed() is True:
12        microbit.sleep(50)
13        if button_a.is_pressed() is True and button_b.is_pressed() is True:
14            superbit.servo270(superbit.S1, 180)
15

```

First, we need to import the library needed for this lesson from micro:bit, the superbit library is intended for super:bit expansion boards;

display.show(Image.HAPPY): Display the smile pattern on the micro:bit matrix;

superbit.servo270(superbit.S1, 120): Initialization makes the servo rotate to 120°;

while True: In infinite loop

if button_a.is_pressed() is True and button_b.is_pressed() is False:

superbit.servo270(superbit.S1, 120)

elif button_a.is_pressed() is False and button_b.is_pressed() is True:

superbit.servo270(superbit.S1, 60)

elif button_a.is_pressed() is True and button_b.is_pressed() is True:

microbit.sleep(50)

if button_a.is_pressed() is True and button_b.is_pressed() is True:

superbit.servo270(superbit.S1, 180)

Determine whether the A and B buttons on the micro:bit board are pressed in an infinite loop.

When we press the micro: bit A button, the shovel lays flat(servo rotate to 120°);

when we press the B button, the shovel unloads(servo rotate to 60°); when we press

the micro: bit A + B button, the shovel is raised(servo rotate to 180°).

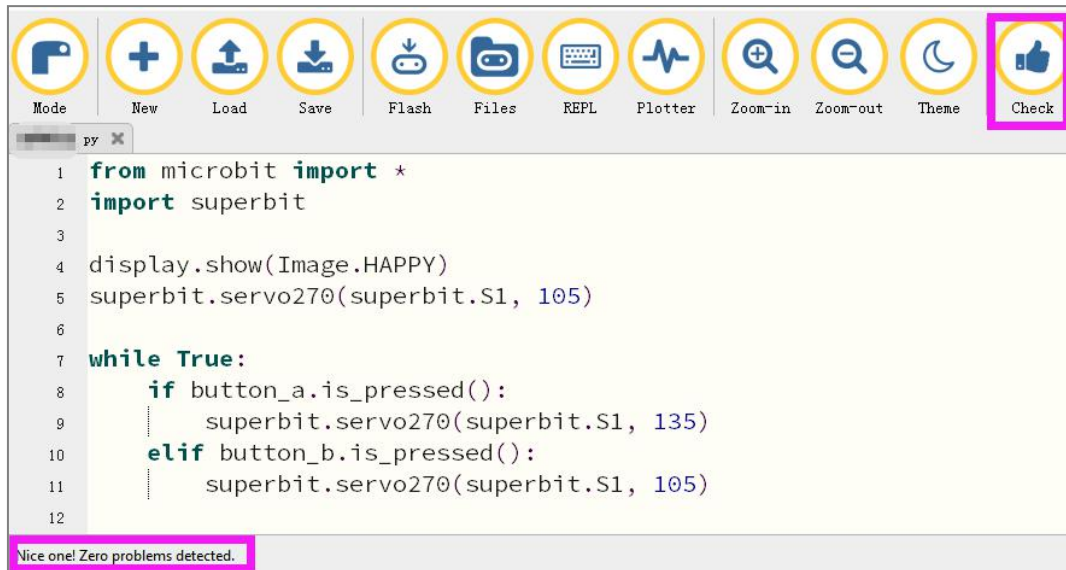
5.Writing and download code

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.

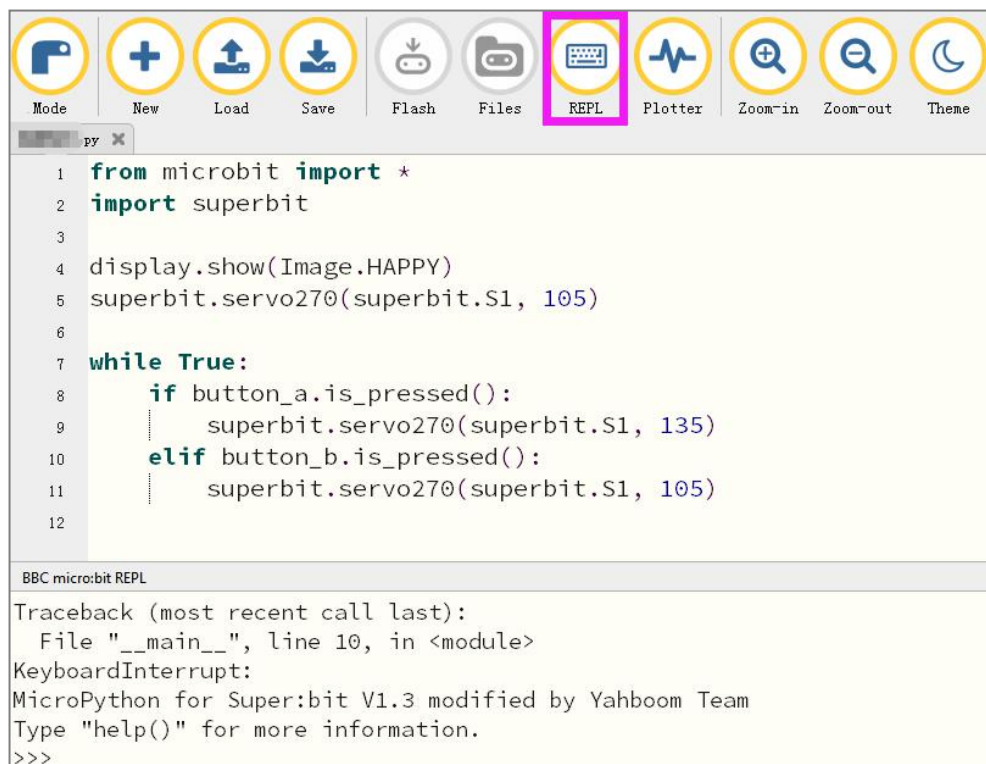
2.You can click the “Check” button to check if our code has an error.

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.

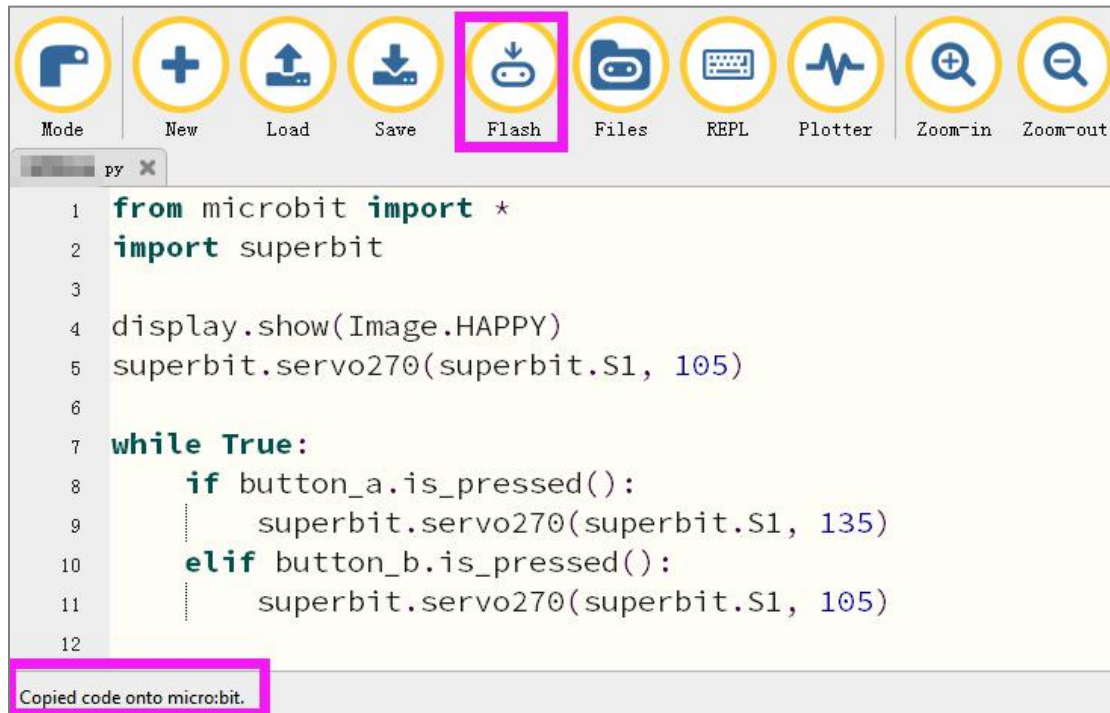


3. Click the 'REPL' button to check whether the Superbit library has been downloaded.

If not, please refer to [Preparation before class] --> [2.4 Python Programming Guide] .



4. After the program is written, 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).

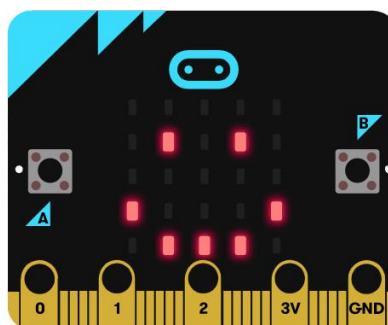


5.If the download failed, please confirm whether the micro:bit is connected to the computer through the micro USB data cable, and confirm whether the Super:bit Python library has been imported.

6.Experimental phenomena

After the program is successfully downloaded, the micro: bit dot matrix will display the smile pattern, as shown below.

Open the power switch, the servo will initialize to 120 ° (lay flat). When we press the micro: bit A button, the shovel lays flat; when we press the B button, the shovel unloads; when we press the micro: bit A + B button, the shovel is raised.



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