Automatic Lift

1.Learning goals

In this course, we mainly learn how to use the MakeCode graphical programming to realize the lifting platform automatically rises and falls.

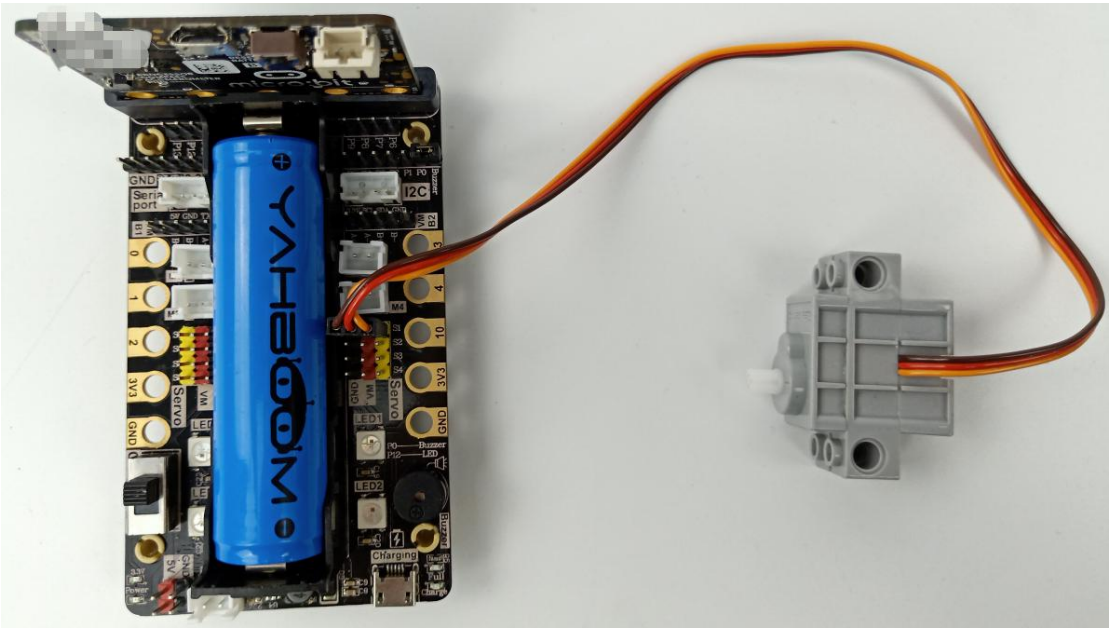
2.Building block assembly steps

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

3.Wiring of servo

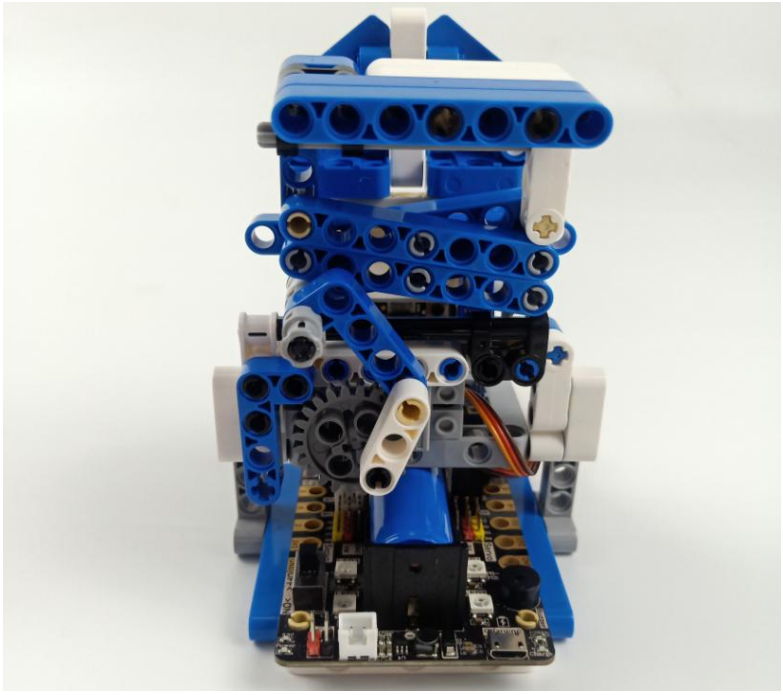
Building block servo insert into the Super: bit expansion board S1 interface, and the orange wiring connect the yellow pin of S1.

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 lifting platform to the lowest. Finally, install the servo. (If you have used programs related to clip robot before, you can skip this step)



4.Code and analysis

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

```
display.show(Image.HAPPY)
np = neopixel.NeoPixel(pin12, 4)
superbit.servo270(superbit.S1, 90)

while True:
    display.show(Image.ARROW_N)
    np[0] = (255, 0, 0)
    np[1] = (255, 0, 0)
    np[2] = (255, 0, 0)
    np[3] = (255, 0, 0)
    np.show()
    superbit.servo270(superbit.S1, 0)
    microbit.sleep(500)
    display.show(Image.ARROW_S)
    np[0] = (0, 255, 0)
    np[1] = (0, 255, 0)
    np[2] = (0, 255, 0)
    np[3] = (0, 255, 0)
    np.show()
    superbit.servo270(superbit.S1, 90)
    microbit.sleep(1000)

```

First, we need to import the library needed for this lesson from micro:bit, superbit

library is dedicated to super:bit expansion board;
display.show(Image.HAPPY)：Display smile pattern on micro:bit matrix.
superbit.servo270(superbit.S1, 90)：Initialization makes the servo rotate to about 90°;

```
while True: main loop
    display.show(Image.ARROW_N)
    np[0] = (255, 0, 0)
    np[1] = (255, 0, 0)
    np[2] = (255, 0, 0)
    np[3] = (255, 0, 0)
    np.show()
    superbit.servo270(superbit.S1, 0)
    microbit.sleep(500)
    display.show(Image.ARROW_S)
    np[0] = (0, 255, 0)
    np[1] = (0, 255, 0)
    np[2] = (0, 255, 0)
    np[3] = (0, 255, 0)
    np.show()
    superbit.servo270(superbit.S1, 90)
    microbit.sleep(1000)
```

An upward arrow pattern is displayed on the micro:bit dot matrix, the RGB light is red, and the lifting platform rises. After 500 ms, we can see a down arrow pattern on the micro:bit dot matrix, the RGB light is green, and the lifting platform is down .

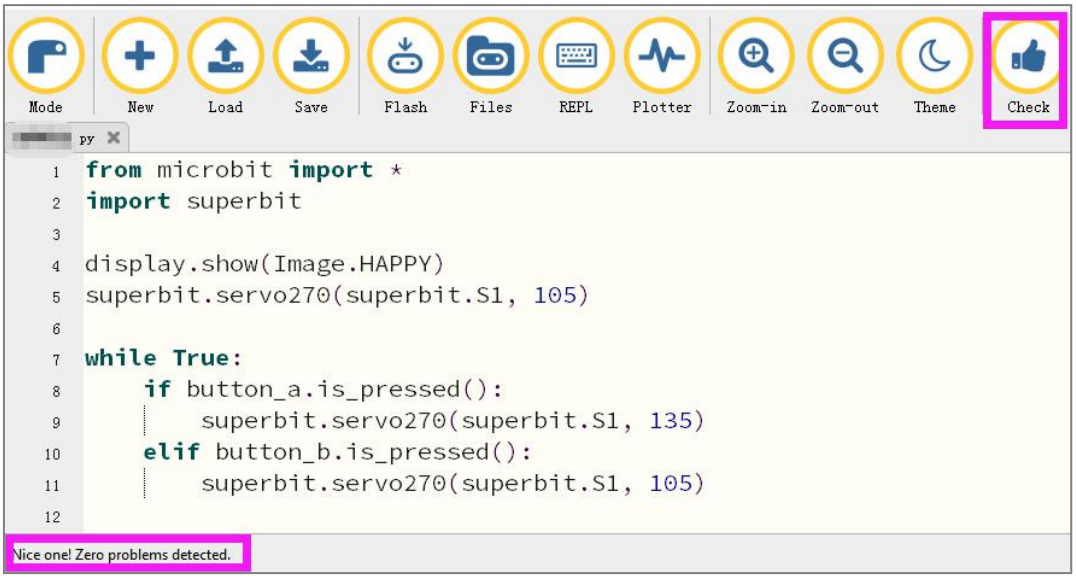
5.Writing and download code

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.

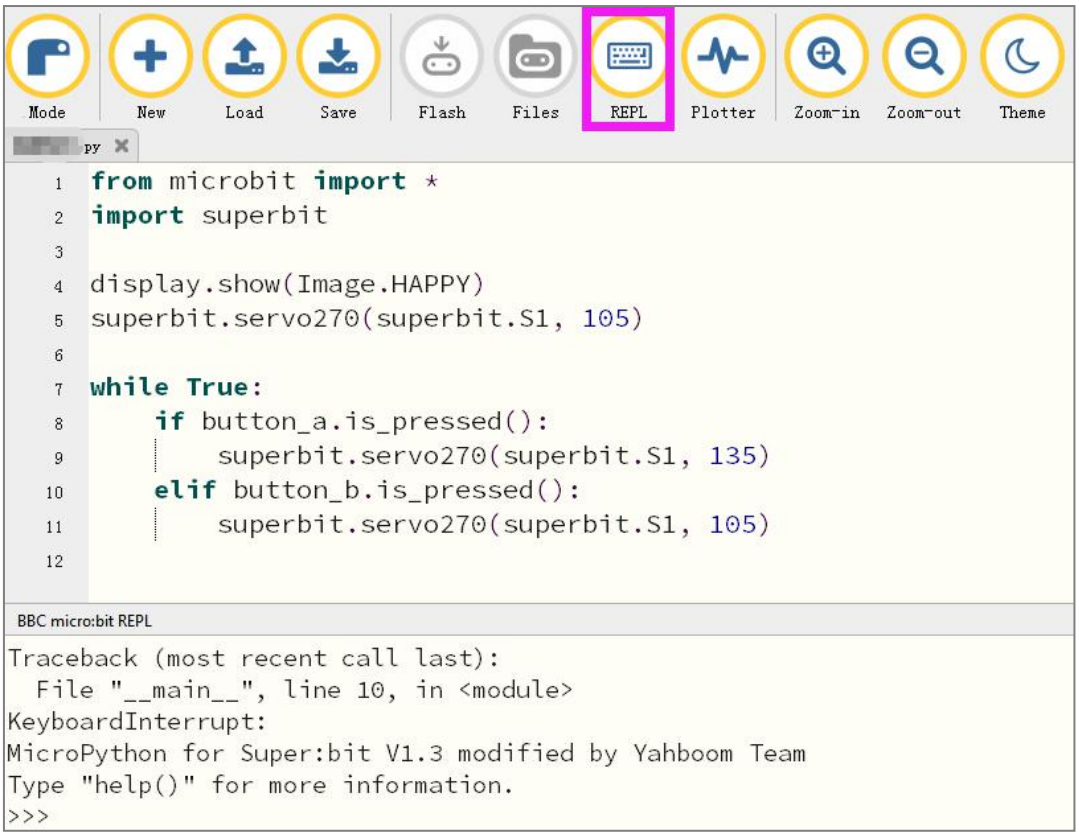
2.You can click the “Check” button to check if our code has an error.

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.

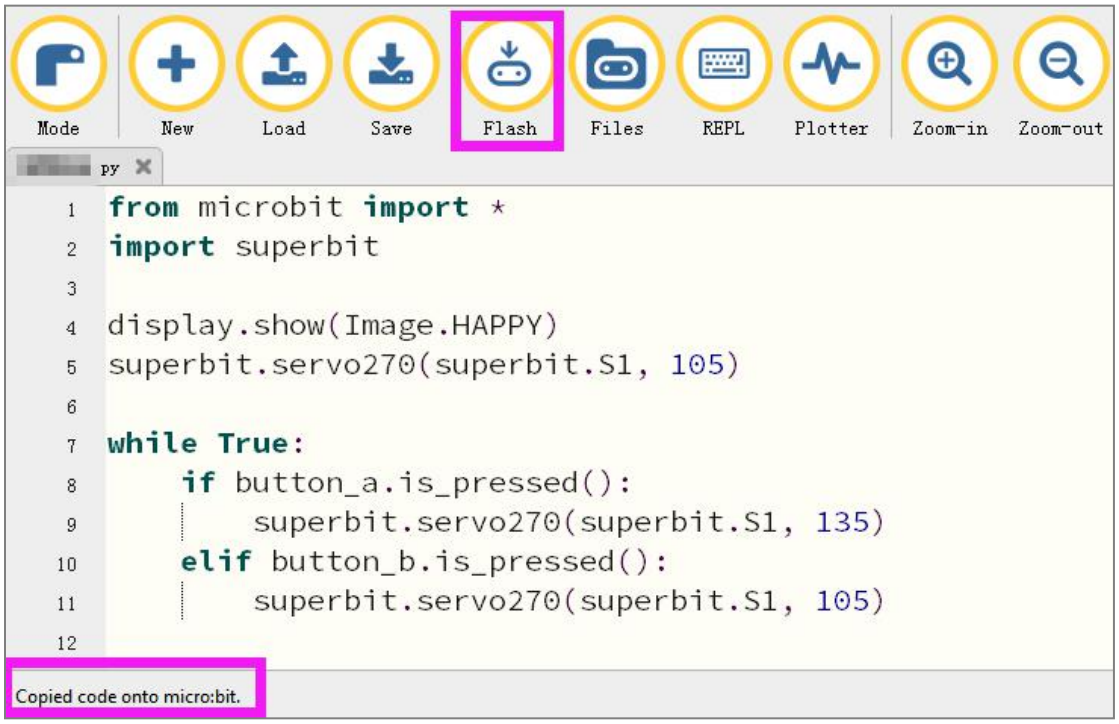


3. Click the ‘REPL’ button to check whether the Superbit library has been downloaded.

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 show a smile pattern.

Open the power switch, the servo will initialize to 0 ° (lifting platform lowest). After 1s, we can see an up arrow pattern on the micro: bit dot matrix, the RGB light turns red, the lifting platform rises.

After 500 ms, we can be seen that a down arrow pattern is displayed on the micro: bit dot matrix, the RGB light turns green, the lifting platform falls. And keep the cycle in this state.

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