Music fortress

1. Learning objectives

In this course, we mainly learn how to use MakeCode graphical programming to make the Mobile shooter "sing" and "dance" at the same time, that is, the motor, servo, buzzer, and RGB light work at the same time.

2. Building blocks

For the building blocks steps, please refer to the installation drawings of **[Assembly Course]-[Mobile shooter]** in the materials or the building blocks installation album.

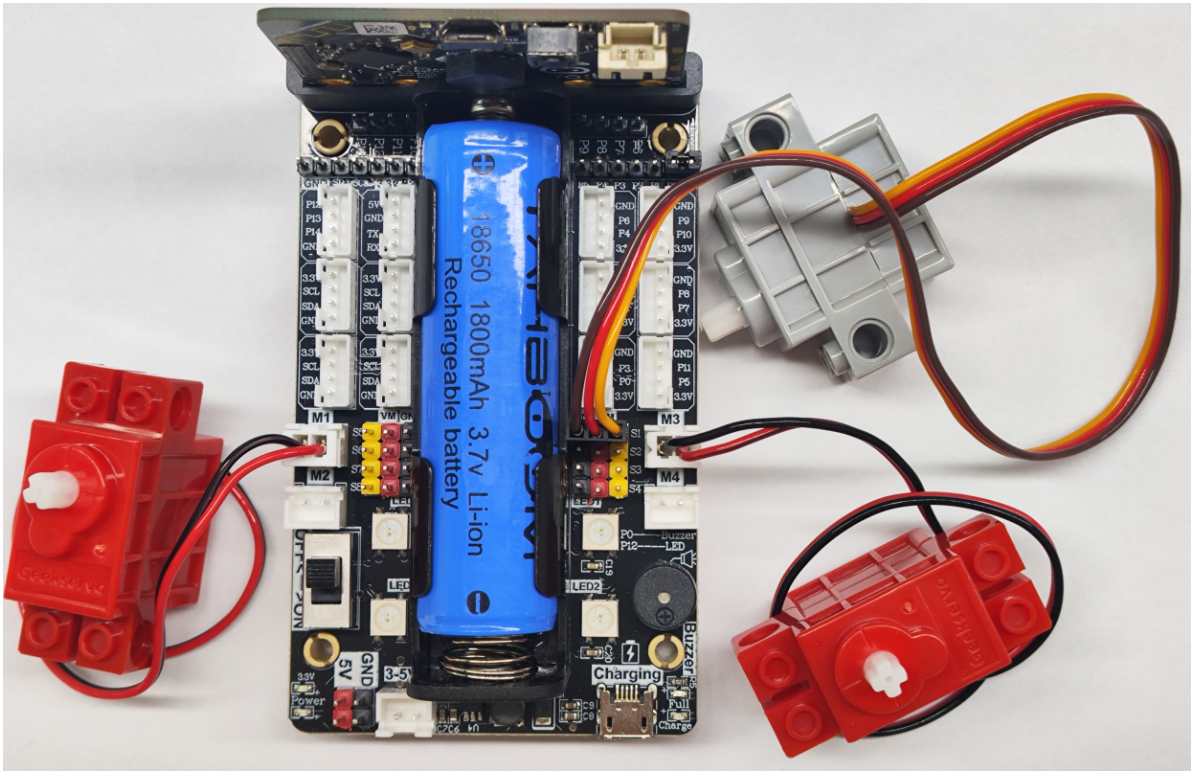
3. Motor wiring

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;

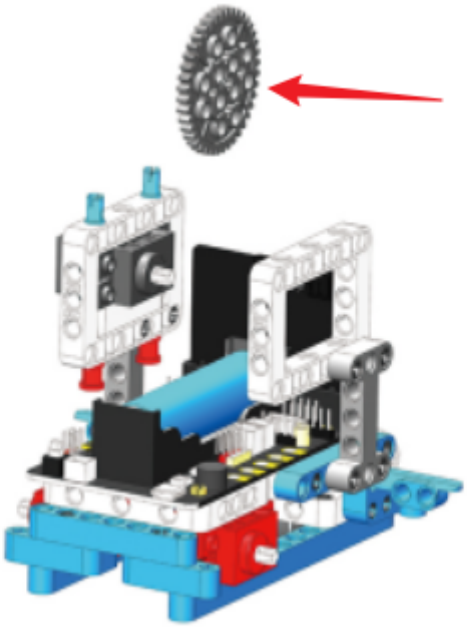
The building blocks servo wiring is inserted into the S1 interface of the Super:bit expansion board, and the orange servo wiring is inserted into the yellow pin of S1.

As shown below:



! Notes:

When taking a course related to the building block servo for the first time, we need to remove the large gear installed on the servo and upload the program of this course to the micro:bit; then turn on the power switch of the Super:bit expansion board and wait for the building block servo to turn to the initial position; then, we can turn off the power, adjust the angle of the car projection rod to be parallel to the ground, and then install the servo gear. (If you have used the Mobile shooter and servo-related programs before, you can skip this step)



4. Programming

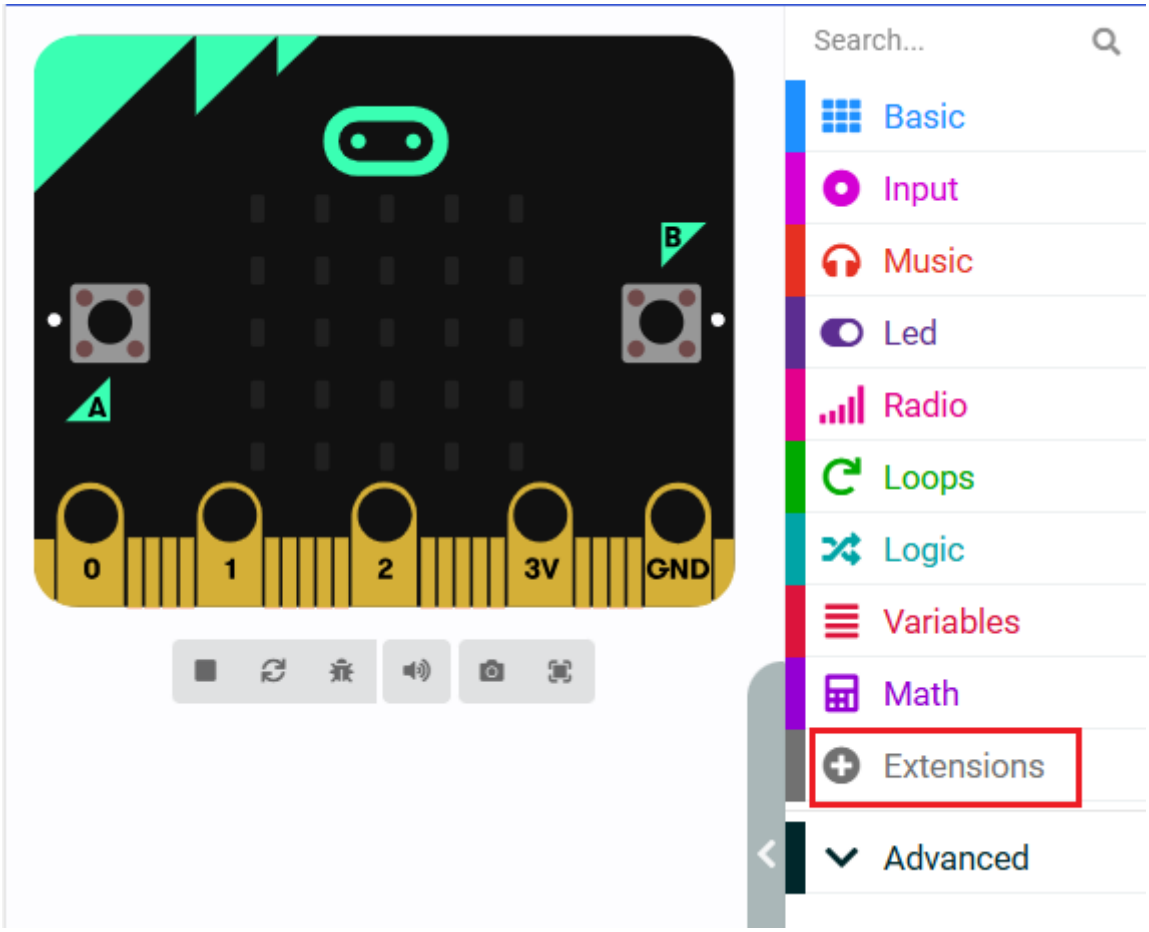
Method 1 Online programming:

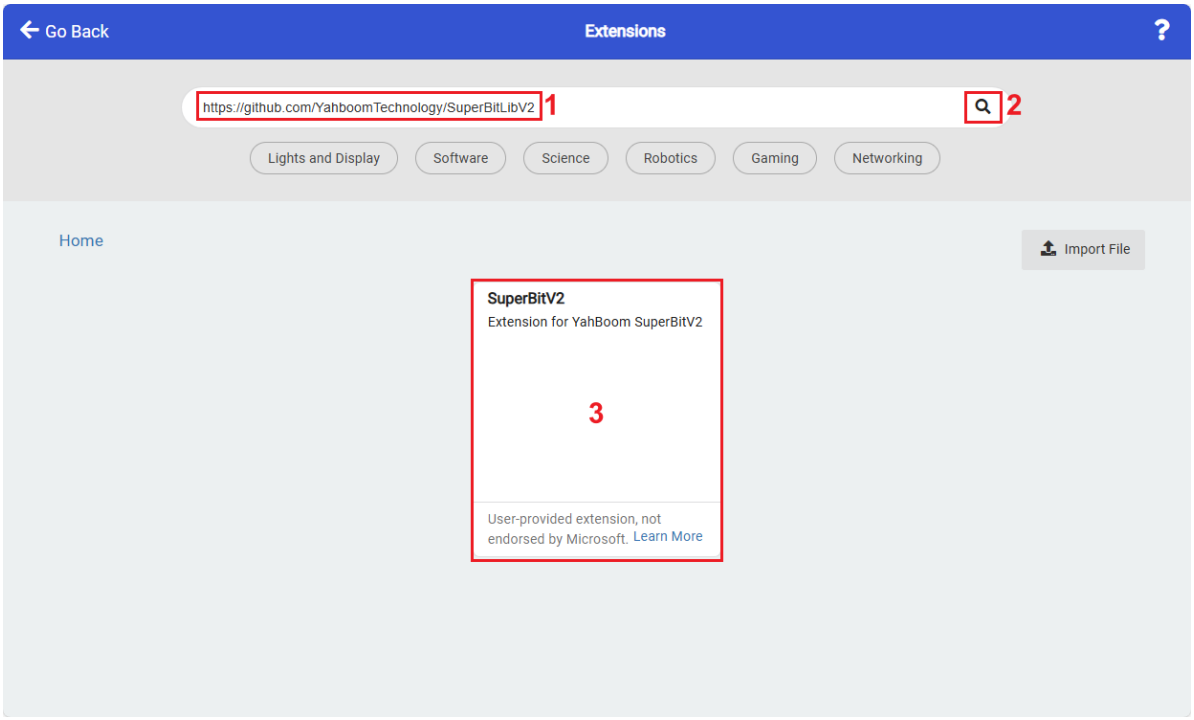
First, connect micro:bit to the computer via a USB data cable. The computer will pop up a U disk. Click the URL in the U disk: https://makecode.microbit.org/ to enter the programming interface. Then, add the Yahboom smart software package **https://github.com/YahboomTechnology/SuperBitLibV2** to start programming.

Method 2 Offline programming:

Open the offline programming software MakeCode and enter the programming interface. Click [New] and add the Yahboom smart software package **https://github.com/YahboomTechnology/SuperBitLibV2** to start programming.

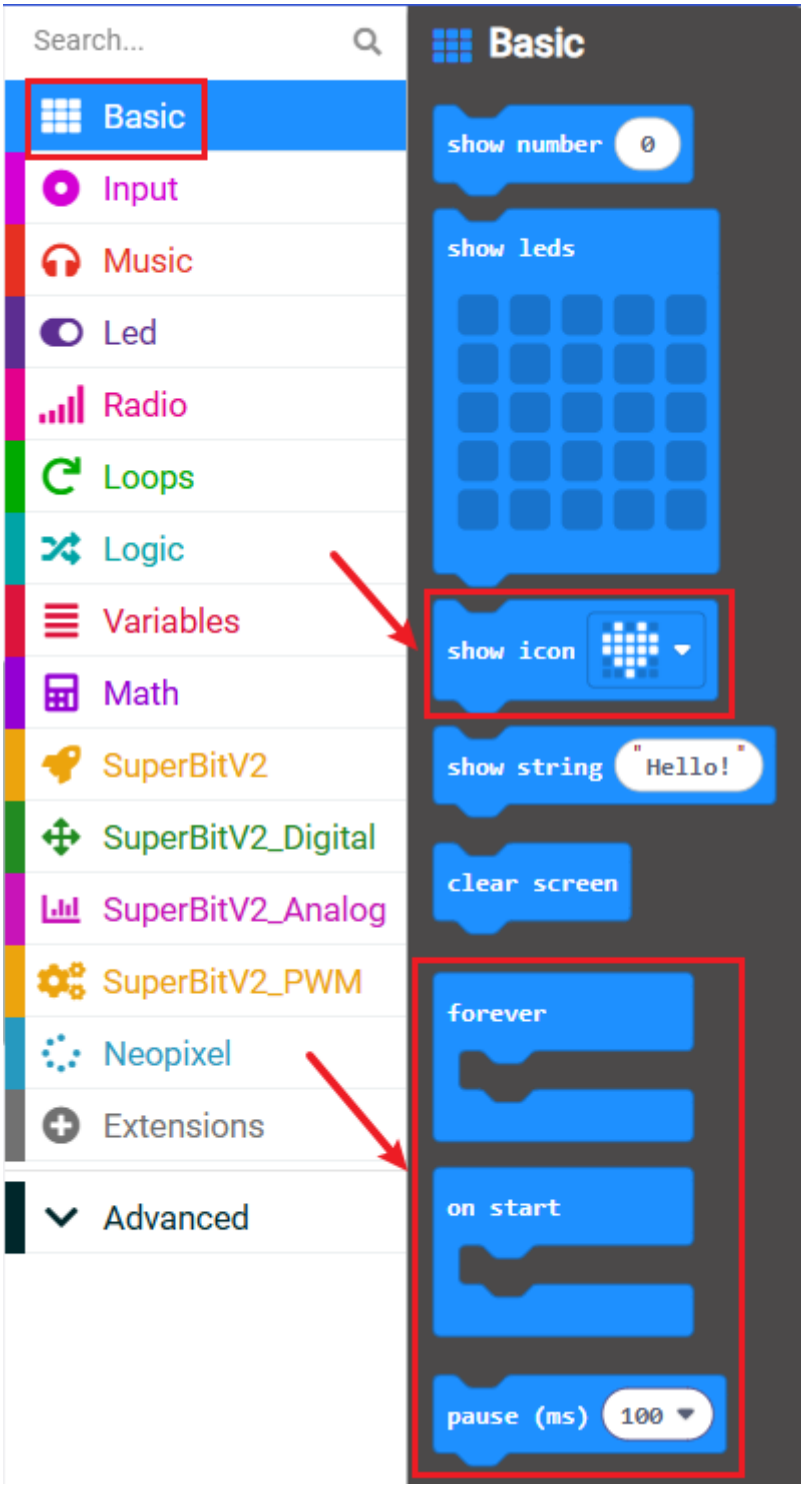
4.1 Adding extension packs



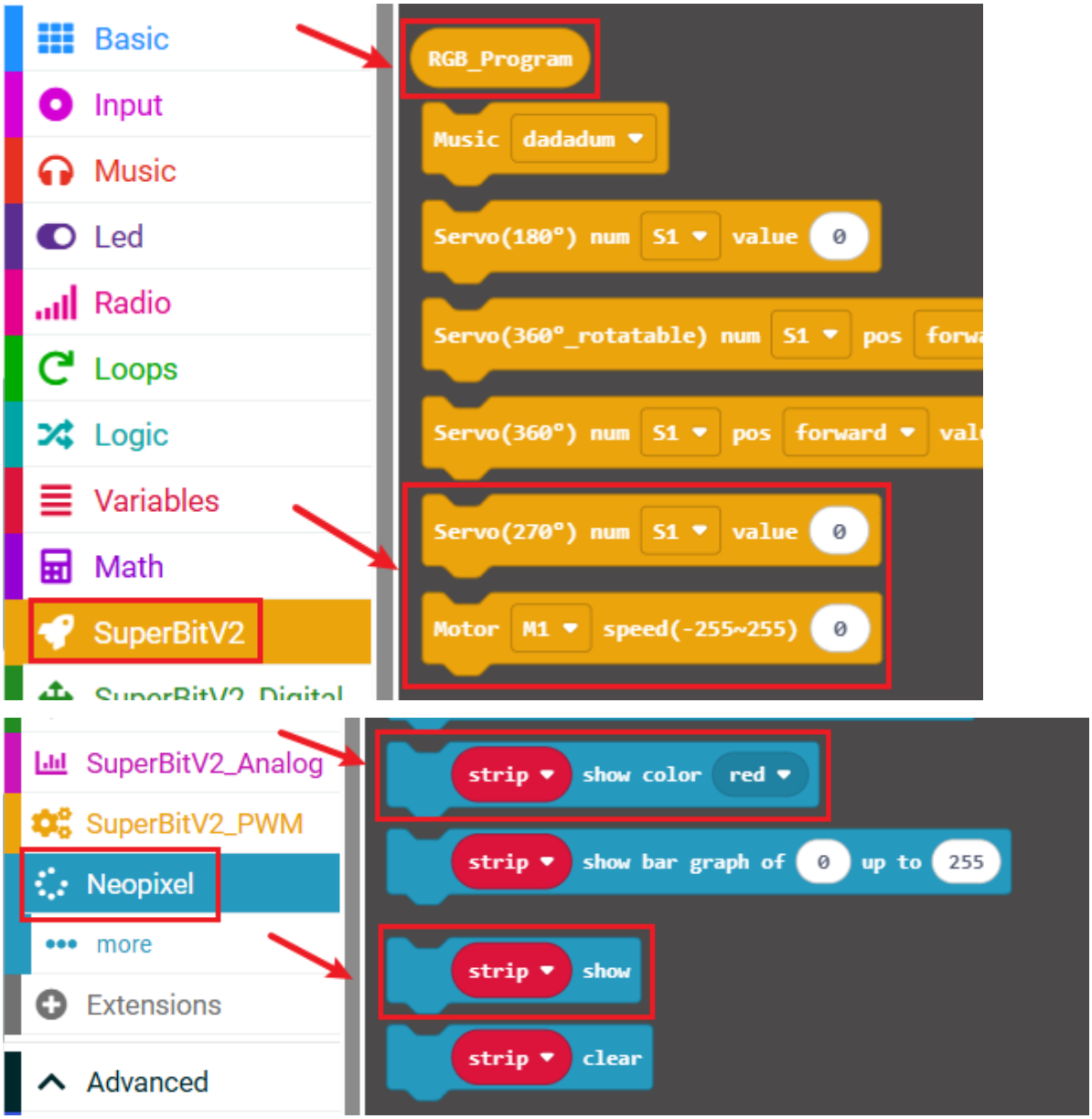


4.2 Building blocks used

The locations of the building blocks required for this programming are shown in the figure below.

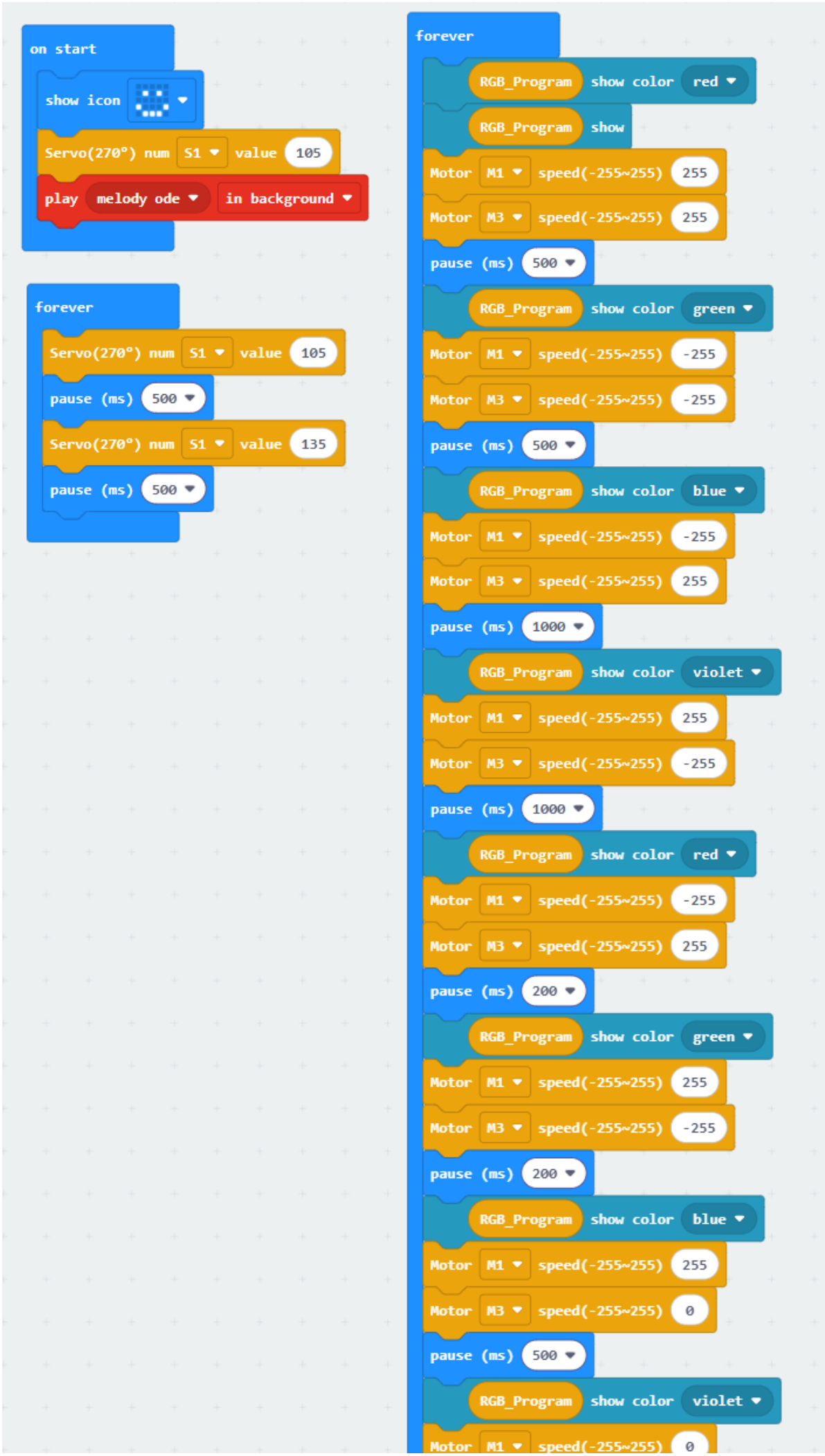

Search...
Basic
Input
Music
Led
Radio
Loops
Logic
Variables
Math
SuperBitV2
SuperBitV2_Digital
SuperBitV2_Analog
SuperBitV2_PWM
Neopixel
Extensions
Advanced
Basic
show number 0
show leds
show icon
show string "Hello!"
clear screen
forever
on start
pause (ms) 100

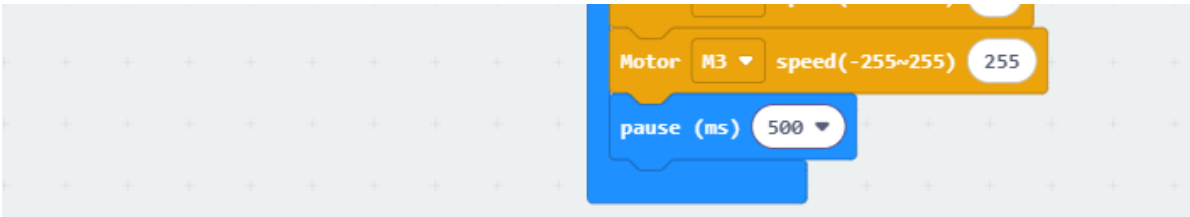

Search...
Basic
Input
Music
play melody dadadum in background
stop melody all



4.3 Combining blocks

The summary program is shown in the figure below.

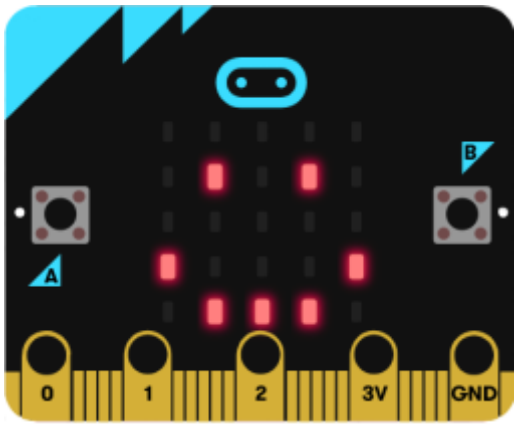

on start
show icon
Servo(270°) num S1 value 105
play melody ode in background
forever
Servo(270°) num S1 value 105
pause (ms) 500
Servo(270°) num S1 value 135
pause (ms) 500
forever
RGB_Program show color red
RGB_Program show
Motor M1 speed(-255~255) 255
Motor M3 speed(-255~255) 255
pause (ms) 500
RGB_Program show color green
Motor M1 speed(-255~255) -255
Motor M3 speed(-255~255) -255
pause (ms) 500
RGB_Program show color blue
Motor M1 speed(-255~255) -255
Motor M3 speed(-255~255) 255
pause (ms) 1000
RGB_Program show color violet
Motor M1 speed(-255~255) 255
Motor M3 speed(-255~255) -255
pause (ms) 1000
RGB_Program show color red
Motor M1 speed(-255~255) -255
Motor M3 speed(-255~255) 255
pause (ms) 200
RGB_Program show color green
Motor M1 speed(-255~255) 255
Motor M3 speed(-255~255) -255
pause (ms) 200
RGB_Program show color blue
Motor M1 speed(-255~255) 255
Motor M3 speed(-255~255) 0
pause (ms) 500
RGB_Program show color violet
Motor M1 speed(-255~255) 0



You can also directly open the **microbit-Music-fortress.hex** file provided in this experiment and drag it into the browser that opens the URL, and the program diagram of this project source code will be automatically opened

5. Experimental phenomenon

After the program is successfully downloaded, the micro:bit dot matrix will display a smiley face, as shown in the figure below. Turn on the power switch, the Mobile shooter will play the music "Ode", and will move forward-->backward-->left-->right-->left-->right, the RGB light will switch to different colors, and the projection rod will constantly change position.



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