Freestyle Micro:bit handle control

1.Learning goals

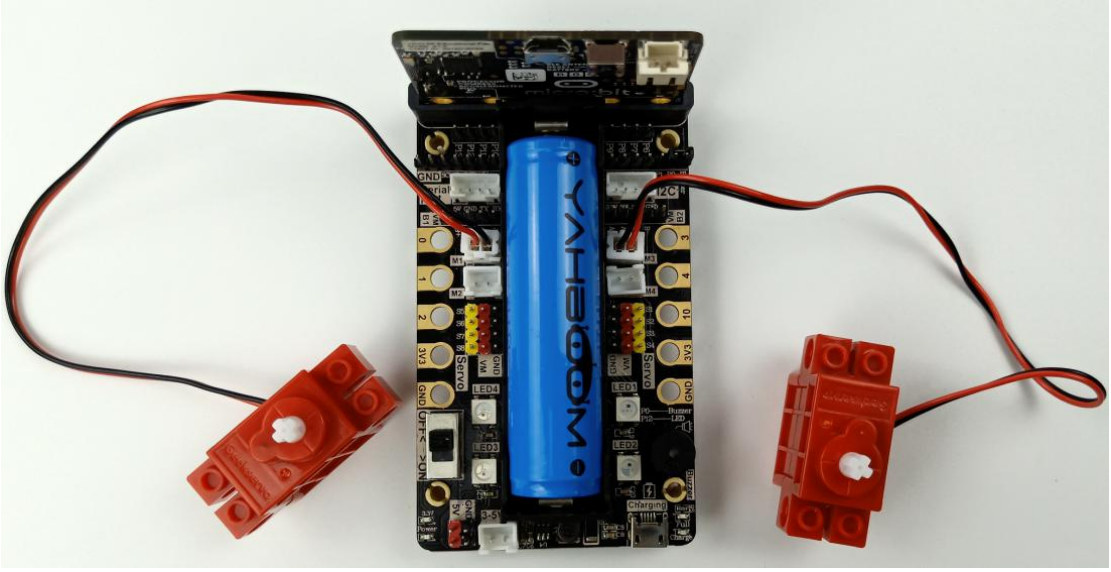
In this course, we mainly learn how to use handle control Freestyle.

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]-[Freestyle].

3.Wiring of motor and servo

The motor wiring on the left side of the freestyle 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 freestyle is inserted into the M3 interface of the Super:bit expansion board, and the black wire is close to the battery side;
As shown below:



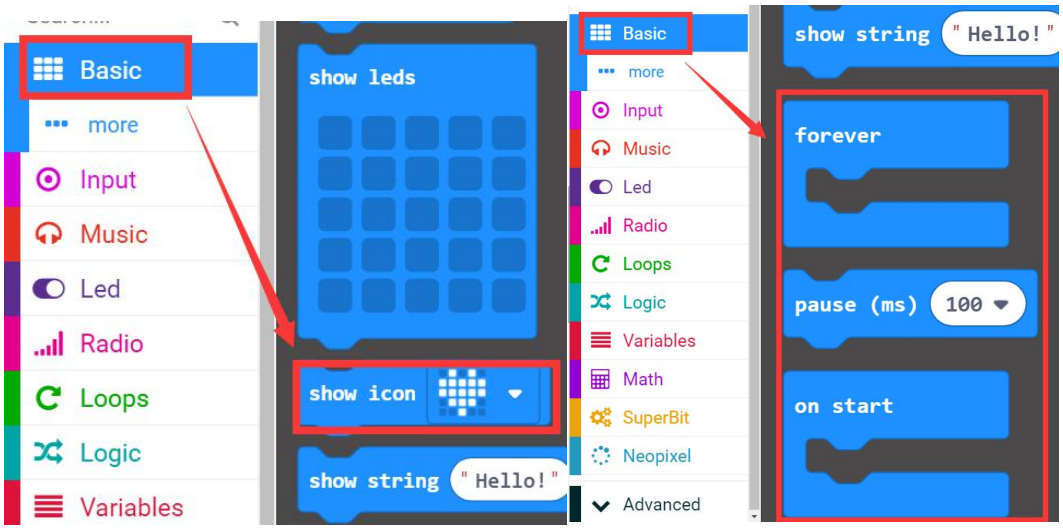
4.Programming method

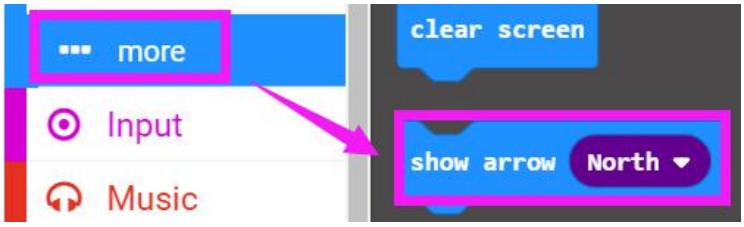
Mode 1 online programming: First, we need to connect the micro:bit to the computer by USB cable. The computer will pop up a USB flash drive and click on the URL in the USB flash drive: http://microbit.org/ to enter the programming interface. Add the Yahboom package **https://github.com/lzty634158/SuperBit** and **https://github.com/lzty634158/GHBit** to program.

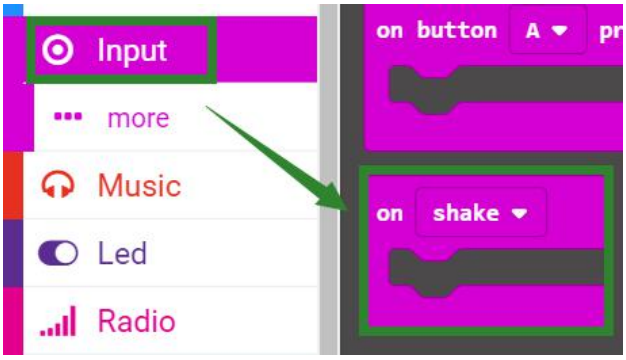
Mode 2 offline programming: We need to open the offline programming software. After the installation is complete, enter the programming interface, click【New Project】, add Yahboom package: **https://github.com/lzty634158/SuperBit** and **https://github.com/lzty634158/GHBit** , you can program.

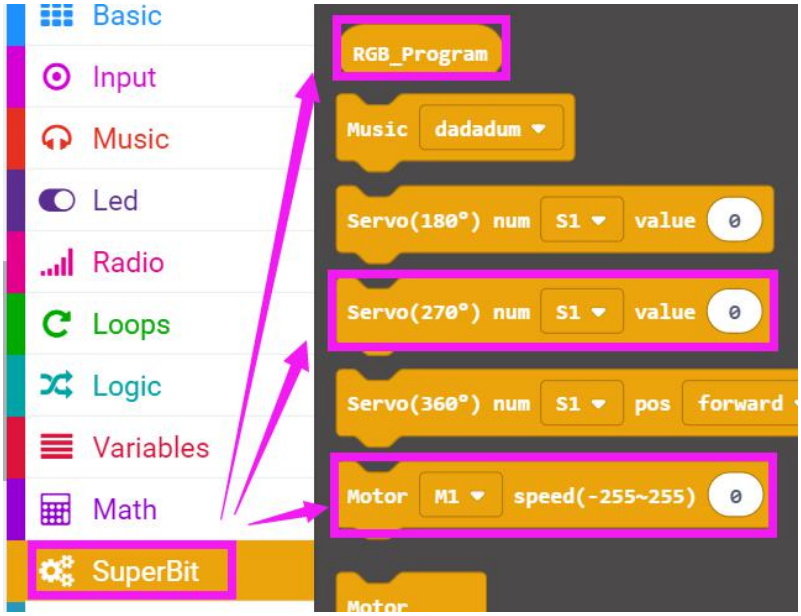
5.Looking for blocks

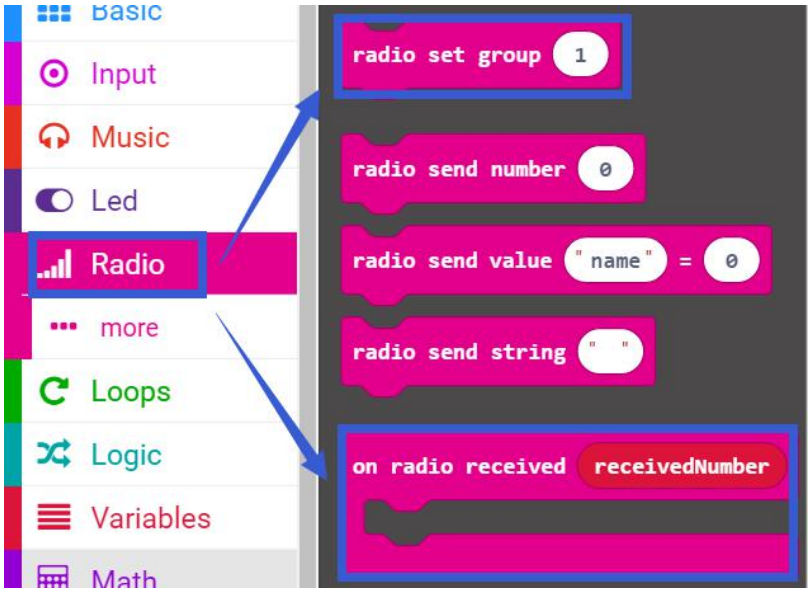
The following is the location of the building blocks required for this programming.

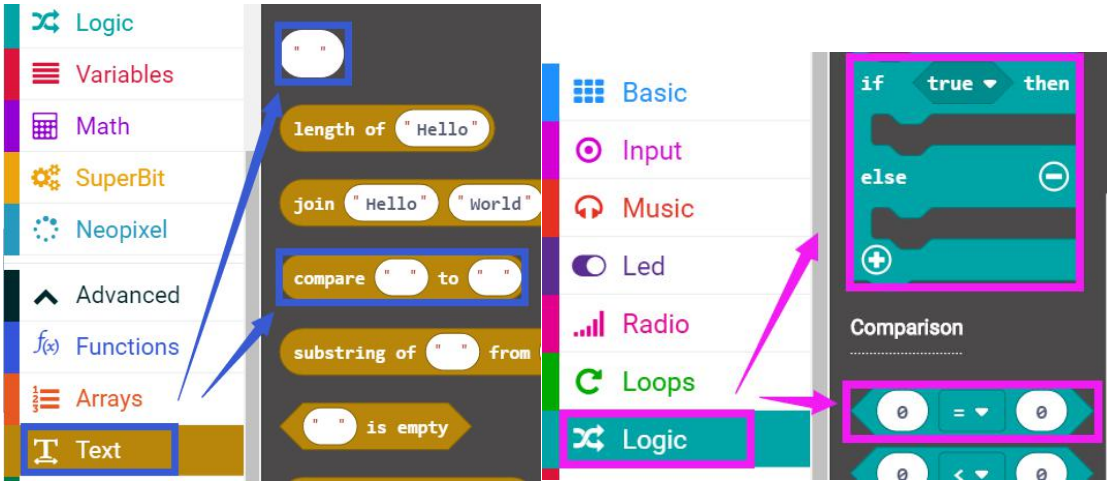

Basic
more
Input
Music
Led
Radio
Loops
Logic
Variables
show leds
show icon
show string
" Hello! "
Basic
more
Input
Music
Led
Radio
Loops
Logic
Variables
Math
SuperBit
Neopixel
Advanced
show string
" Hello! "
forever
pause (ms)
100
on start

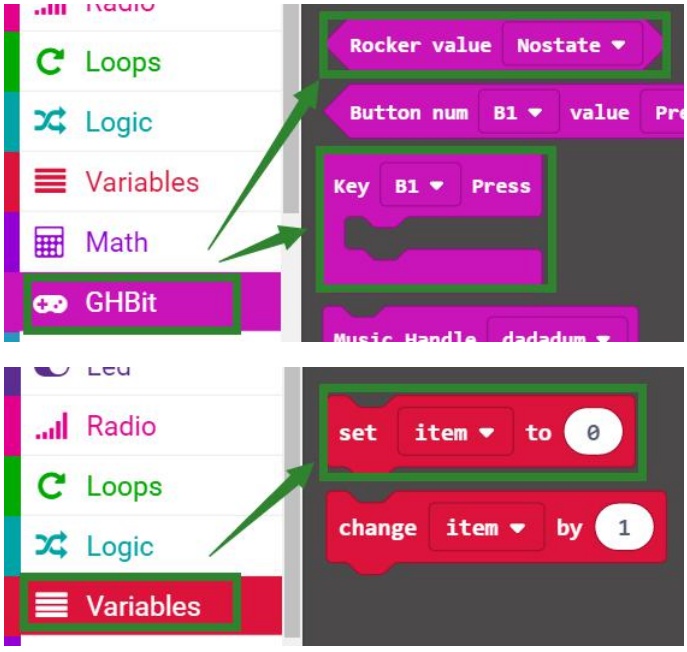

more
Input
Music
clear screen
show arrow
North


Input
more
Music
Led
Radio
on button
A
on
shake


Basic
Input
Music
Led
Radio
Loops
Logic
Variables
Math
SuperBit
RGB_Program
Music
dadadum
Servo(180°) num
S1
value
0
Servo(270°) num
S1
value
0
Servo(360°) num
S1
pos
forward
Motor
M1
speed(-255~255)
0
Motor

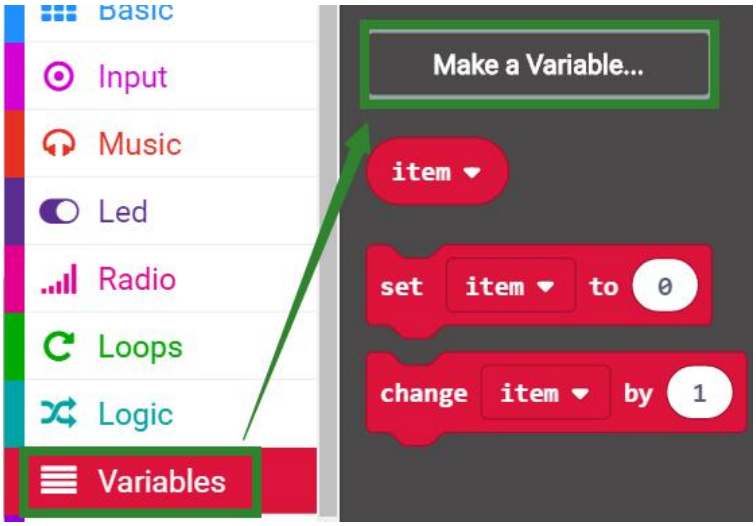






How to create a new variable

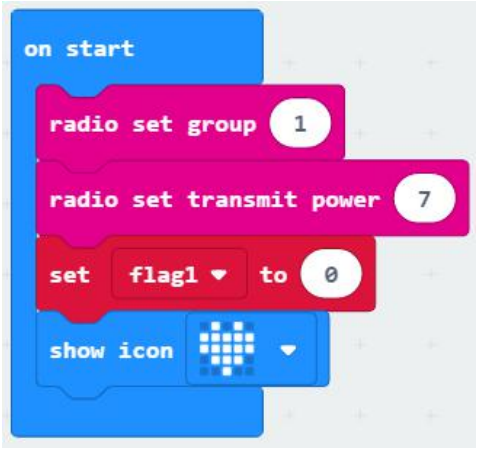
①Find the [Variable] option in the building block column-[Make a Variable]

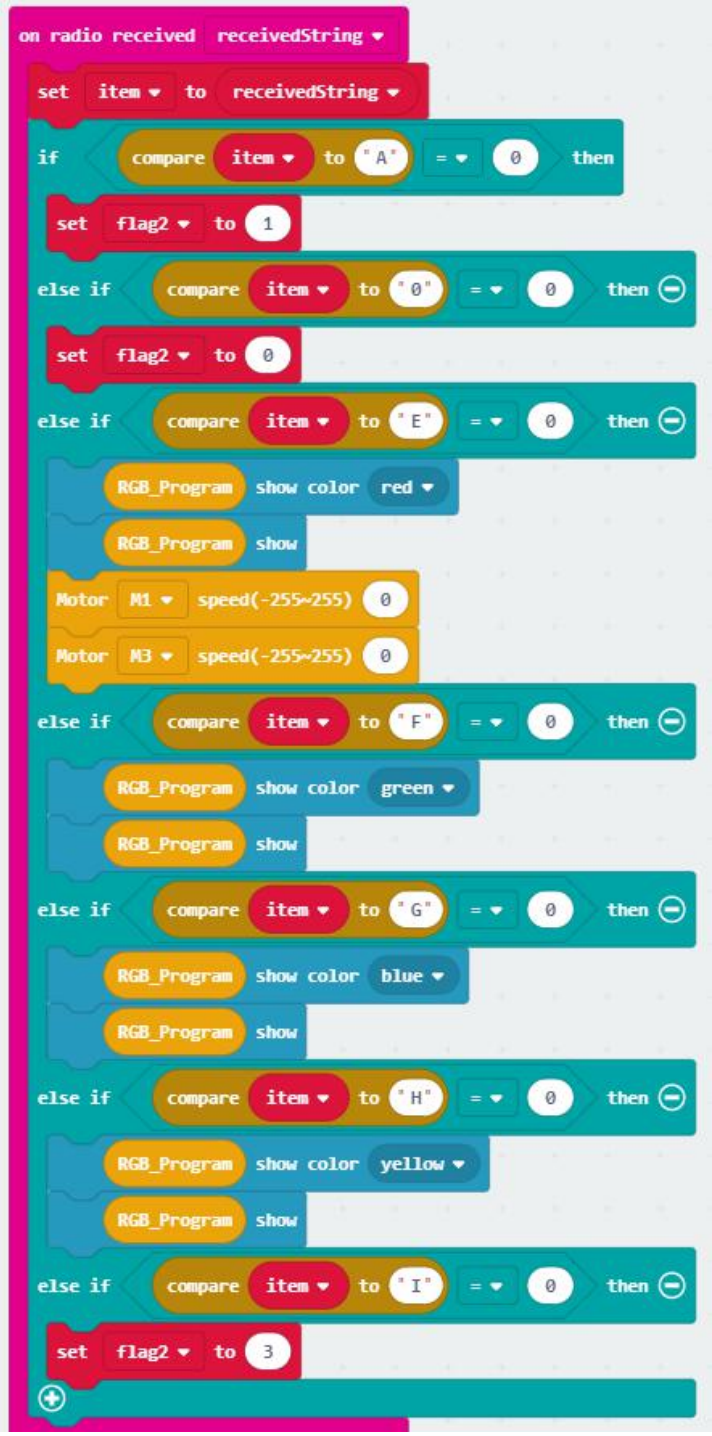


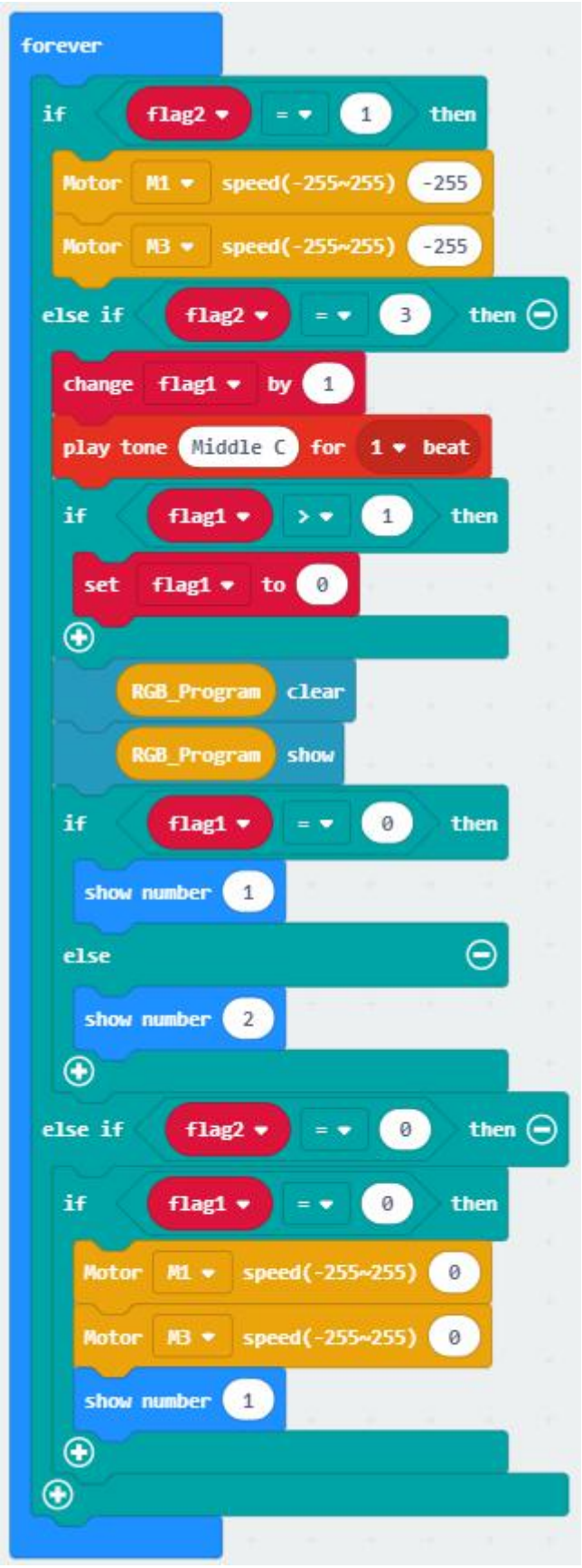
②Enter the name of variable to complete the new variable.

6.Combine block

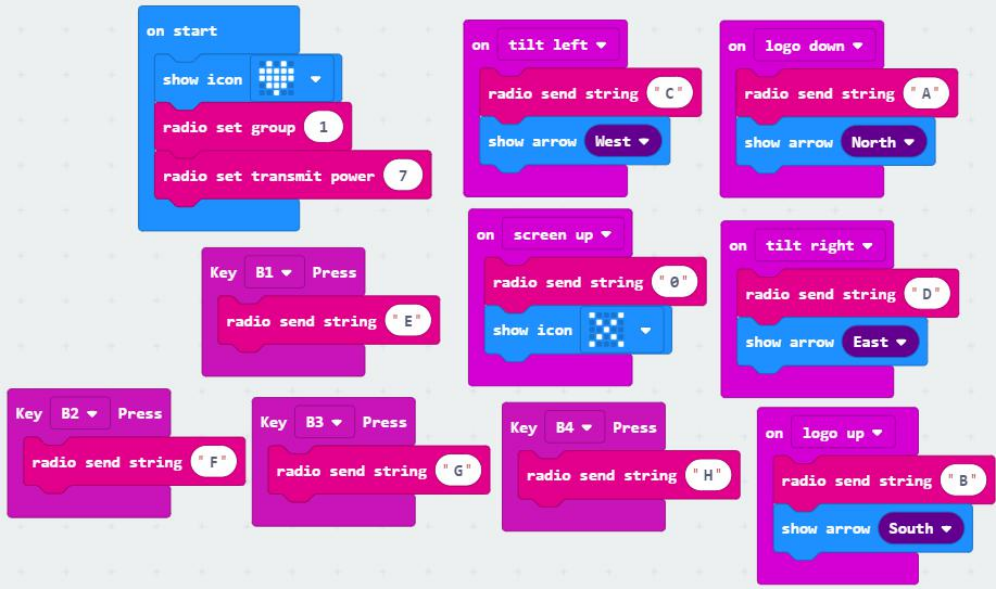
The Freestyle program is shown below.



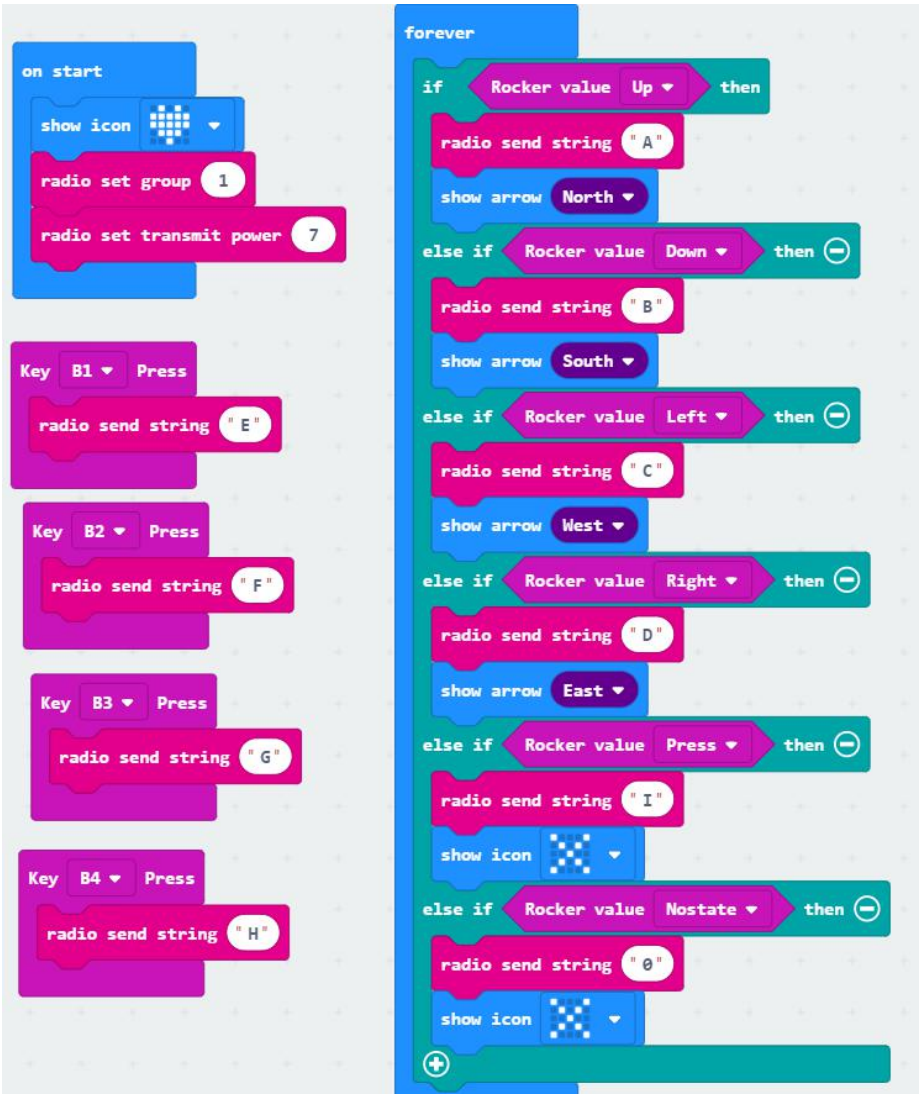

on radio received receivedString
set item to receivedString
if compare item to "A" = 0 then
set flag2 to 1
else if compare item to "0" = 0 then
set flag2 to 0
else if compare item to "E" = 0 then
RGB_Program show color red
RGB_Program show
Motor M1 speed(-255~255) 0
Motor M3 speed(-255~255) 0
else if compare item to "F" = 0 then
RGB_Program show color green
RGB_Program show
else if compare item to "G" = 0 then
RGB_Program show color blue
RGB_Program show
else if compare item to "H" = 0 then
RGB_Program show color yellow
RGB_Program show
else if compare item to "I" = 0 then
set flag2 to 3



Handle gravity control code, as shown below.



Handle rocker control code, as shown below.



7.Experimental phenomena

We need to download the Freestyle code into the micro: bit board of the Freestyle.
Open the power switch of the Freestyle, we can see a heart pattern displayed on the micro:bit dot matrix;
We need to download the Handle code into the micro:bit board of the handle.
Open the power switch of the handle, we can see that the micro: bit dot matrix will initially display a heart pattern, and then display an "X" pattern, indicating that the handle is in the default(no data is sent).
They will automatically pairing, then, we can start remote control the Freestyle by handle.
The handle functions are shown below.

Rocker control

After the handle and the Freestyle are paired successfully, we can see that the Freestyle displays the number 1 on the micro:bit dot matrix, which indicating it in mode 1 at this time.
In the case of mode 1:

- The rocker is pushed forward to control the Freestyle movement, and it stops when you release your hand;
- Press the red button to light up the red RGB light;
- Press the green button to light the green RGB light;
- Press the yellow button to light the yellow RGB light;
- Press the blue button to light up the blue RGB light.

We can press the rocker to switch to mode 2. At this time, we can see the number 2 on the micro: bit dot matrix of the Freestyle, indicating that it in mode 2.
In the case of mode 2:

- Push the rocker forward to control the Freestyle,movement, and keep advance when you release your hand;
- Press the red button to turn on the red RGB light to stop the Freestyle;
- Press the green button to light the green RGB light;
- Press the yellow button to light the yellow RGB light;
- Press the blue button to light up the blue RGB light.

When we press the rocker each time, it will switch Mode 1 and Mode 2, and the RGB light will turn off.

Handle gravity control

After the handle and the Freestyle are paired successfully, we can see that the Freestyle displays the number 1 on the micro:bit dot matrix.

- The handle is tilted forward to control the movement of the Freestyle, and it stops when handle is placed horizontally;
- Press the red button to light up the red RGB light;
- Press the green button to light the green RGB light;
- Press the yellow button to light the yellow RGB light;
- Press the blue button to light up the blue RGB light.

(Note: The handle gravity control only has this mode, not include mode 2)