Biped robot code Micro:bit handle control

1.Learning goals

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

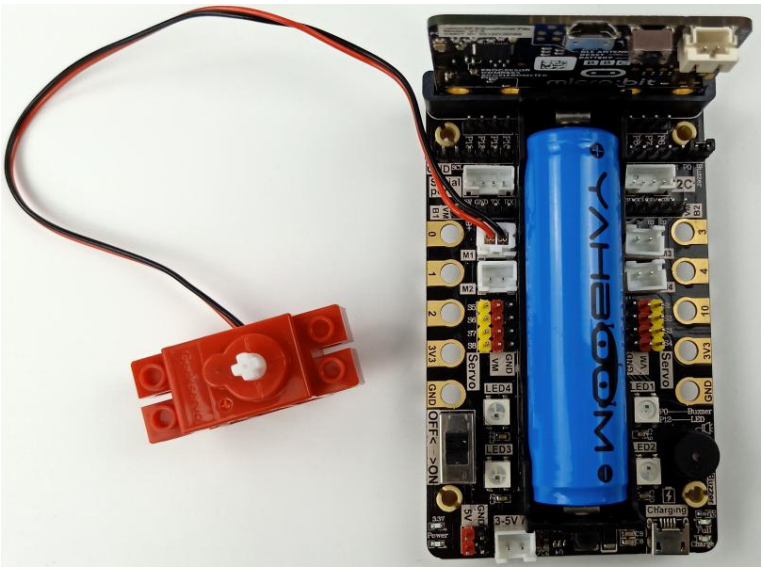
2.Building block assembly steps

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

3.Wiring of motor and servo

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

As shown below.



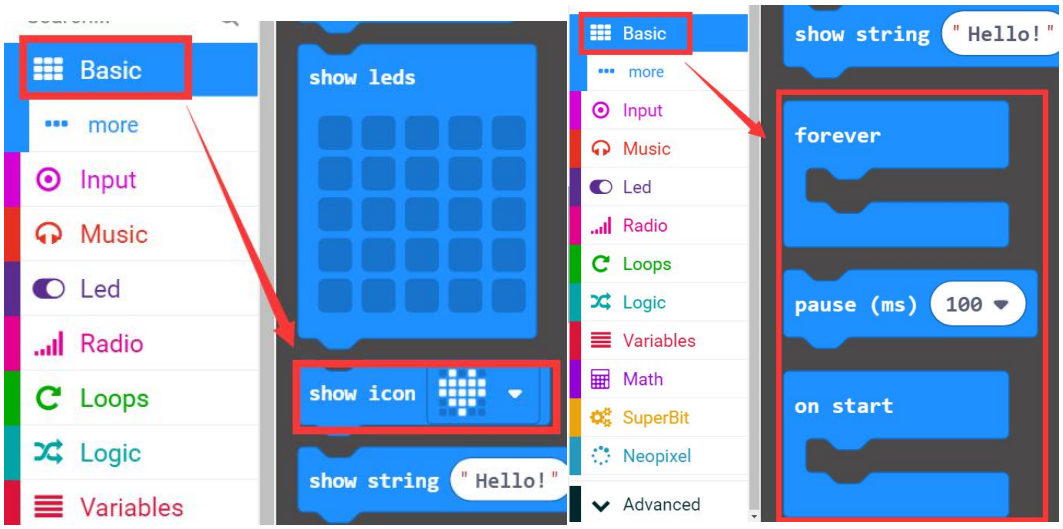
4.Programming method

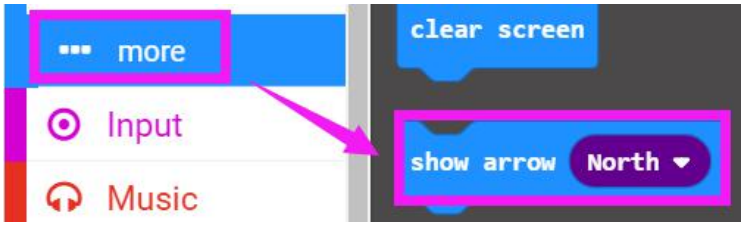
Mode 1 online programming: First, we need to connect the micro:bit to the computer by USB cable. The computer will pop up a USB flash drive and click on the URL in the USB flash drive: http://microbit.org/ to enter the programming interface. Add the Yahboom package **https://github.com/lzty634158/SuperBit**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

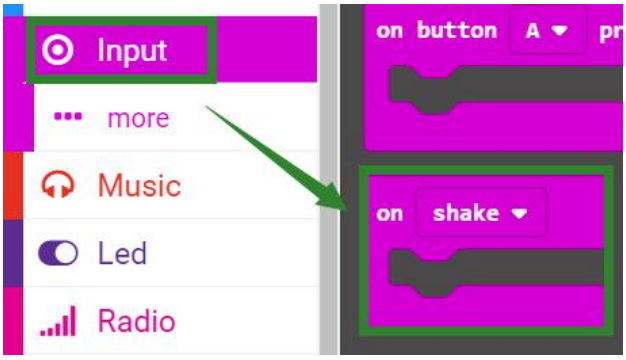
Mode 2 offline programming: We need to open the offline programming software. After the installation is complete, enter the programming interface, click【New Project】, add Yahboom package: **https://github.com/lzty634158/SuperBit** and **https://github.com/lzty634158/GHBit** , you can program.

5.Looking for blocks

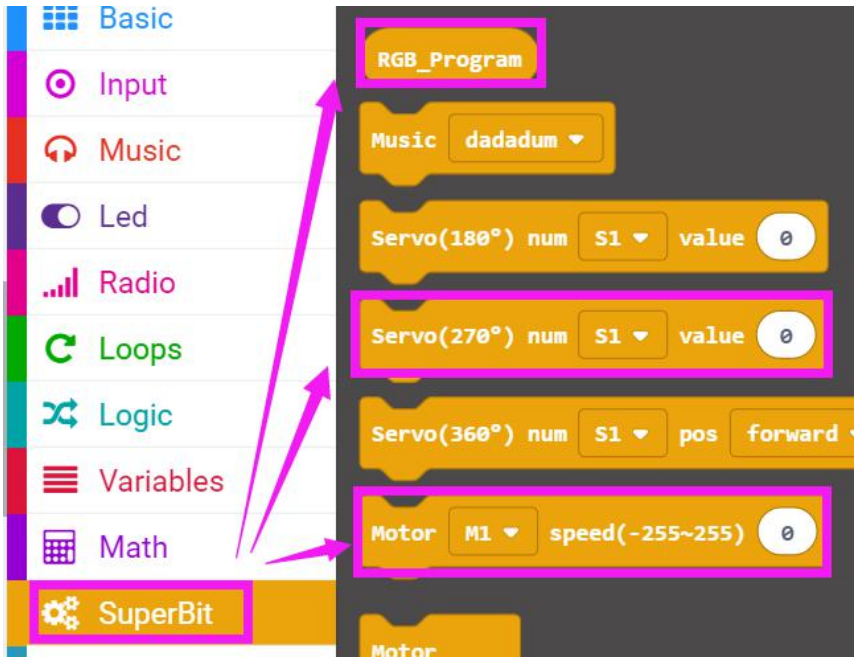
The following is the location of the building blocks required for this programming.

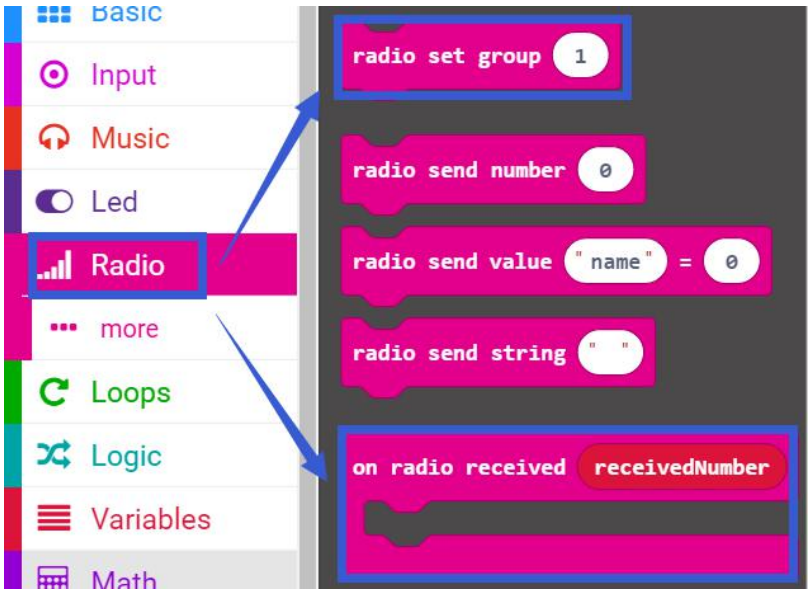

Basic
more
Input
Music
Led
Radio
Loops
Logic
Variables
show leds
show icon
show string
" Hello! "
Basic
more
Input
Music
Led
Radio
Loops
Logic
Variables
Math
SuperBit
Neopixel
Advanced
show string
" Hello! "
forever
pause (ms)
100
on start

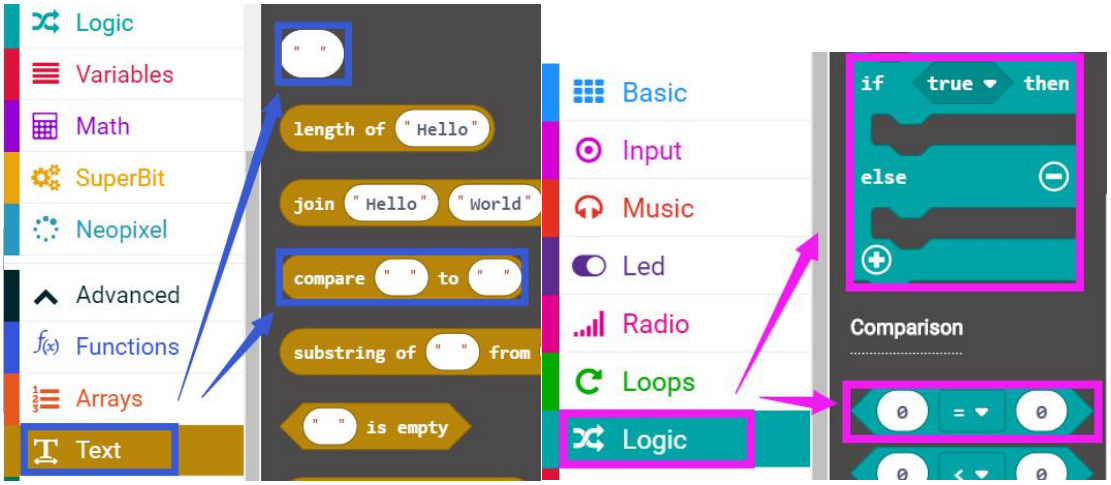

more
Input
Music
clear screen
show arrow
North

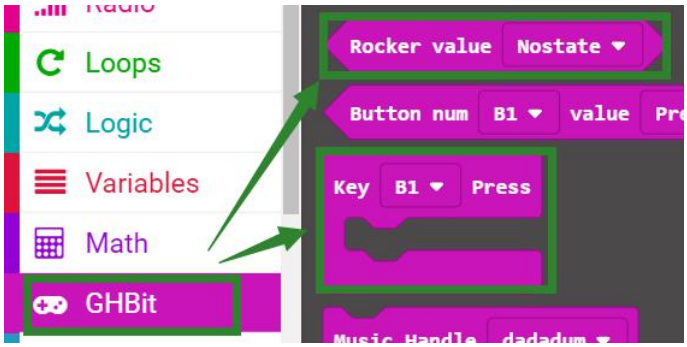

Input
more
Music
Led
Radio
on button
A
on
shake

Radio
Loops
Logic
Variables
set
item
to
0
change
item
by
1


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


Basic
Input
Music
Led
Radio
more
Loops
Logic
Variables
Math
radio set group 1
radio send number 0
radio send value "name" = 0
radio send string ""
on radio received receivedNumber


Logic
Variables
Math
SuperBit
Neopixel
Advanced
Functions
Arrays
Text
""
length of "Hello"
join "Hello" "World"
compare "" to ""
substring of "" from
"" is empty
Basic
Input
Music
Led
Radio
Loops
Logic
if true then
else
Comparison
0 = 0



How to create a new variable

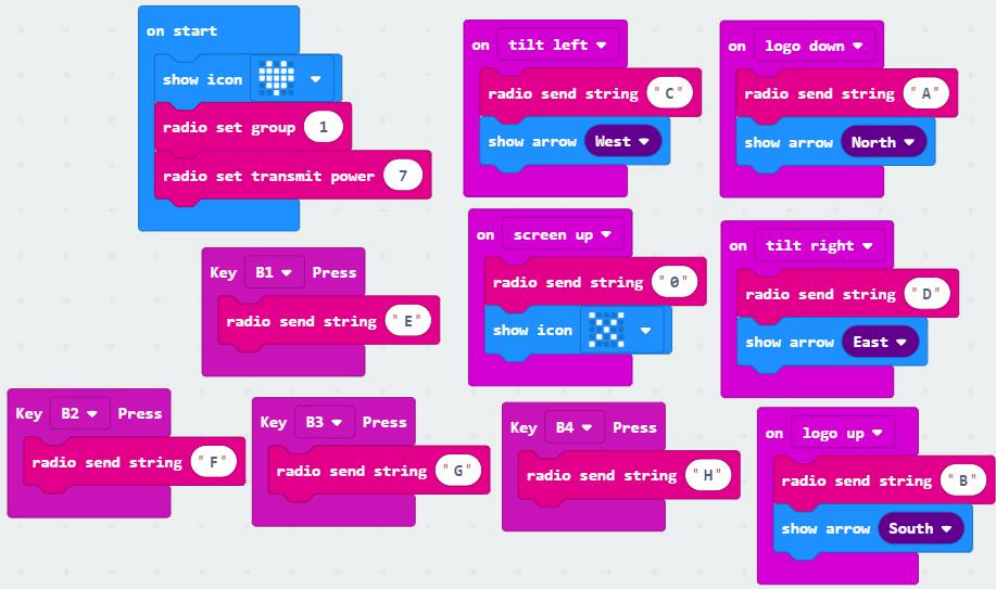
①Find the [Variable] option in the building block column-[Make a Variable]

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

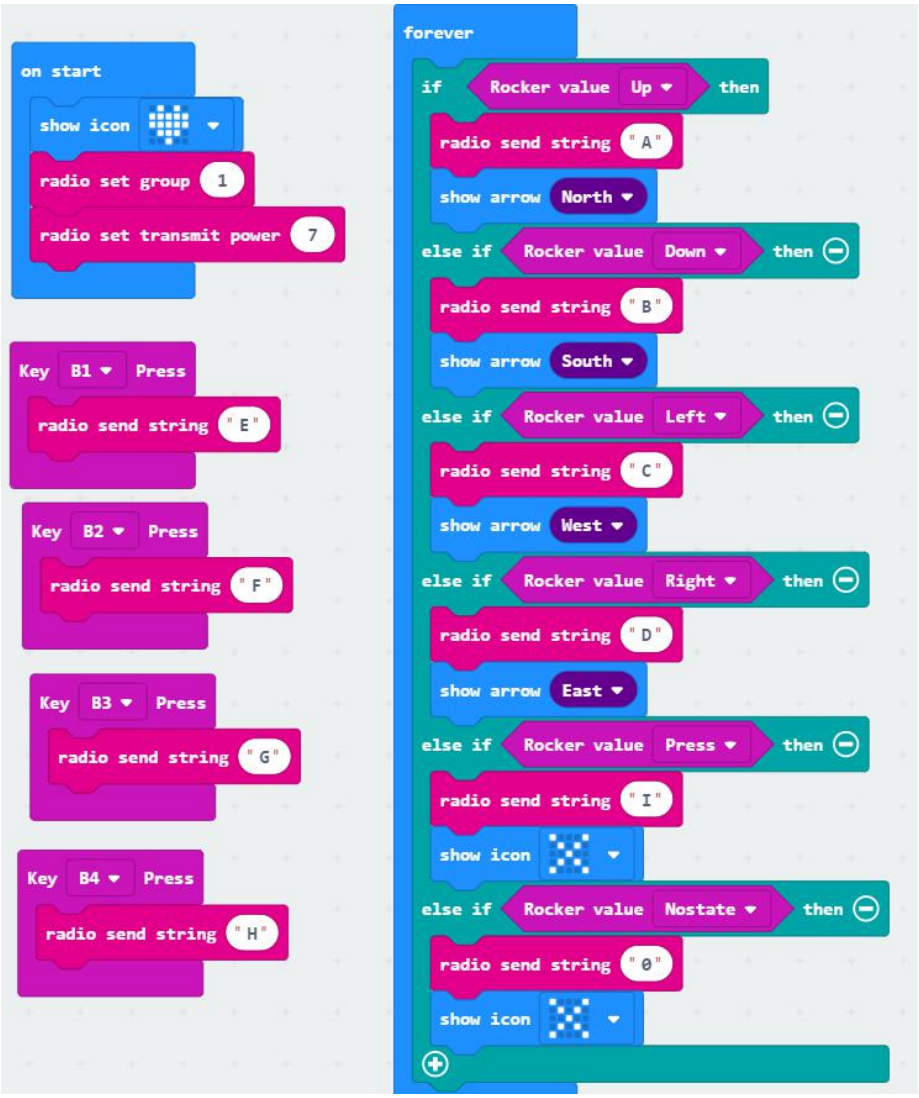
6.Combine block

The Biped robot program is shown below.

Handle gravity control code, as shown below.



Handle rocker control code, as shown below.



7.Experimental phenomena

We need to download the Biped robot code into the micro:bit board of the Biped robot. Open the power switch of the Biped robot, we can see a smile 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 Biped robot by handle.

The handle functions are shown below.

Rocker control

After the handle and the robot are paired successfully, we can see that the robot 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 robot advance, and it stops when you release your hand;
- The rocker is pushed back to control the robot back, 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 Biped robot advance, and keep advance when you release your hand;
- Push the rocker back to control the Biped robot back, and keep advance when you release your hand;
- Press the red button to turn on the red RGB light to stop the robot;

- 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 robot 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 robot forward, and it stops when handle is placed horizontally;
- The handle is tilted forward to control the robot back, 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)