Micro:bit handle control

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1. Learning objectives
2. Building blocks
3. Motor wiring
4. Programming
4.1 Add expansion package
4.2 Building blocks used
4.3 Add new variables
4.4 Combined blocks
5. Experimental phenomenon

1. Learning objectives

In this course, we mainly learn how to use MakeCode graphical programming to realize the microbit handle to control the Lifting platform.

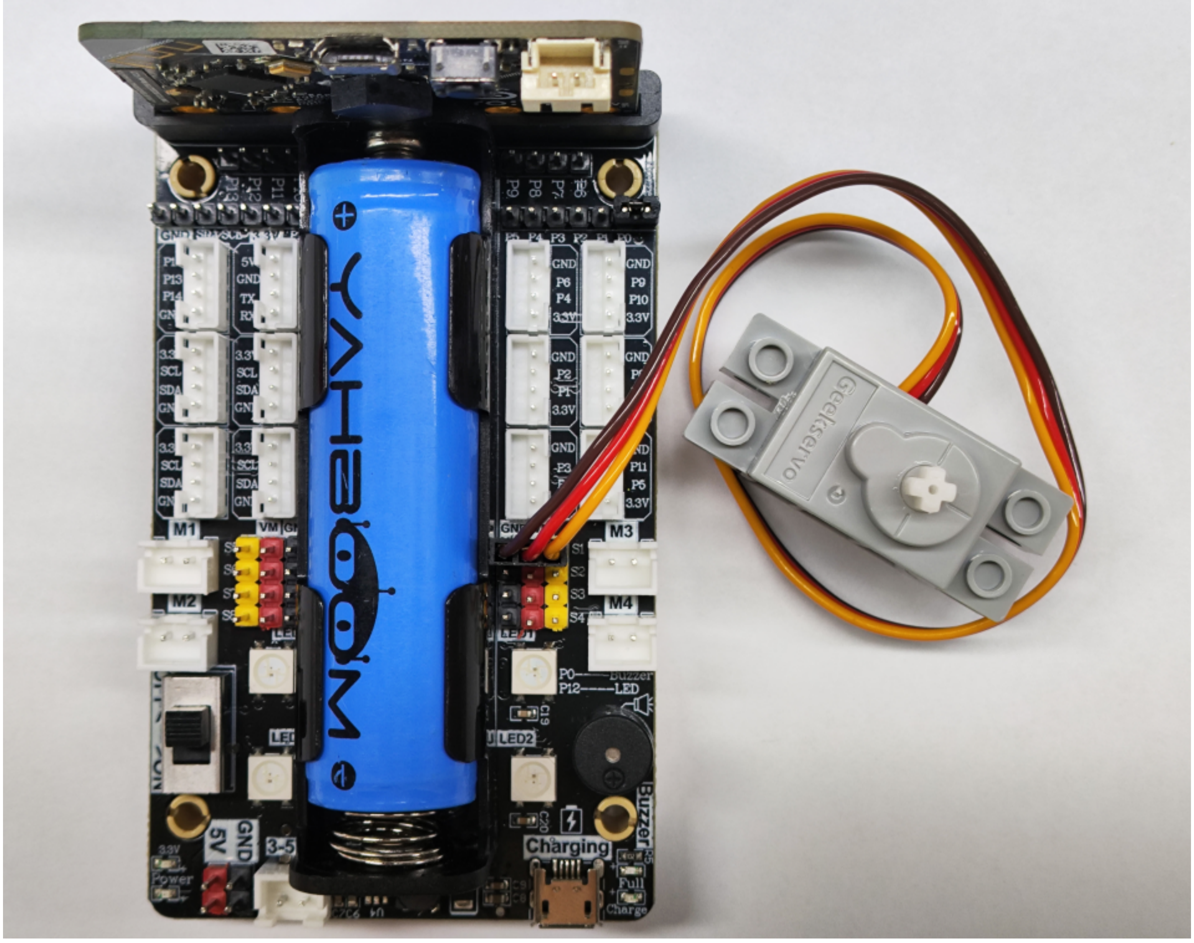
2. Building blocks

For the building blocks steps, please refer to the installation drawings of **[Assembly Course]--[Lifting platform]** in the materials or the building blocks installation book.

3. Motor wiring

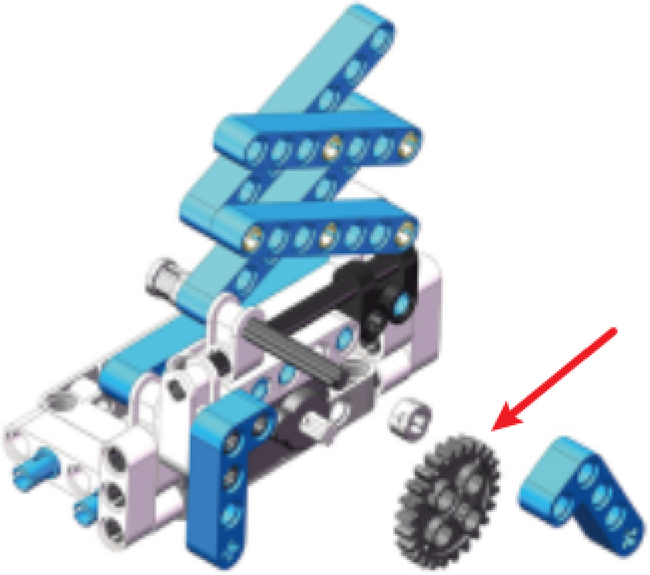
Insert the building blocks servo wiring into the S1 interface of the Super:bit expansion board, and the orange servo wiring into the yellow pin of S1.

As shown in the figure below:



! Notes:

When taking a course related to building block servos for the first time, we need to remove the gears on the servos 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 servos to turn to the initial position; then, we can turn off the power, adjust the lifting platform to the lowest position, and then install the servo gear. (If you have used the lifting platform and servo-related programs before, you can skip this step)



4. Programming

Method 1 Online programming:

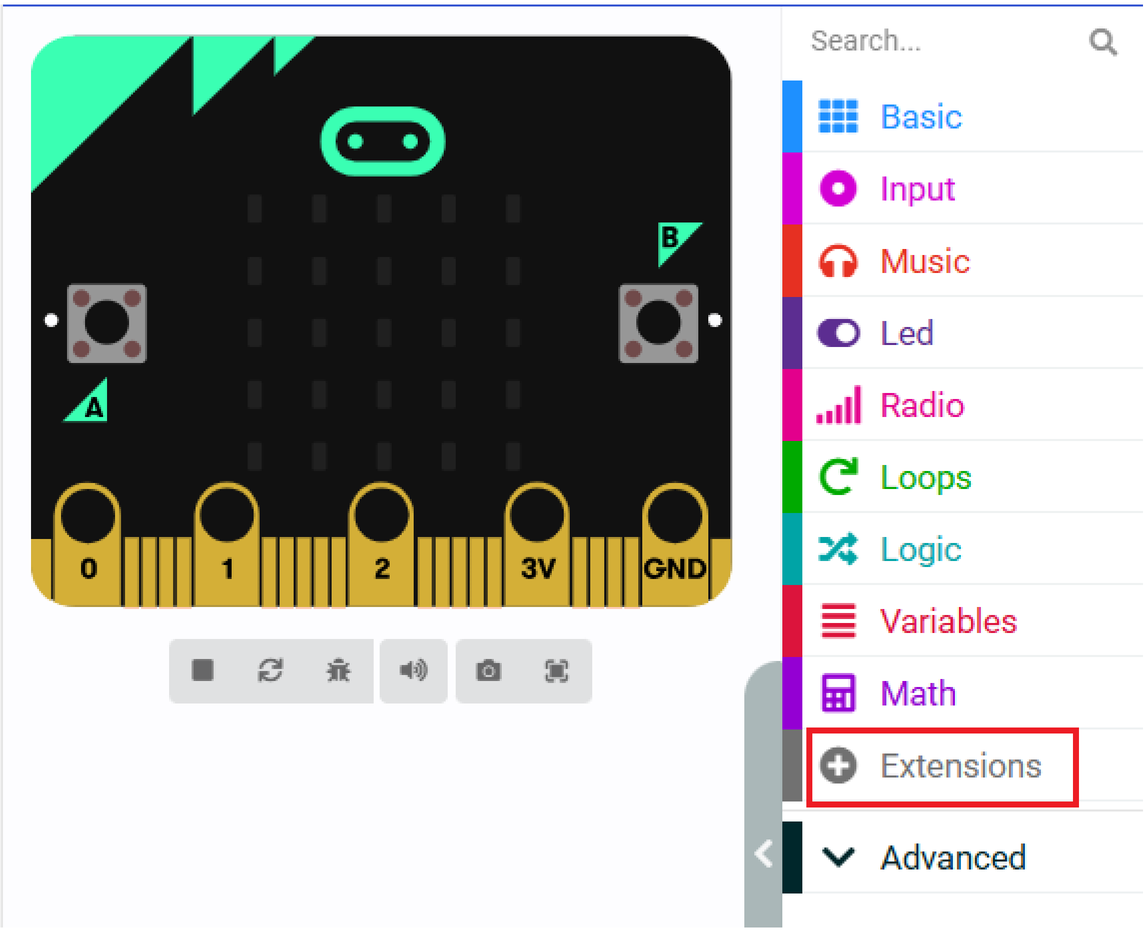
First, connect micro:bit to the computer via a USB data cable. The computer will pop up a U disk. Click the URL in the U disk: https://makecode.microbit.org/ to enter the programming interface. Then, add the Yahboom software package to start programming.

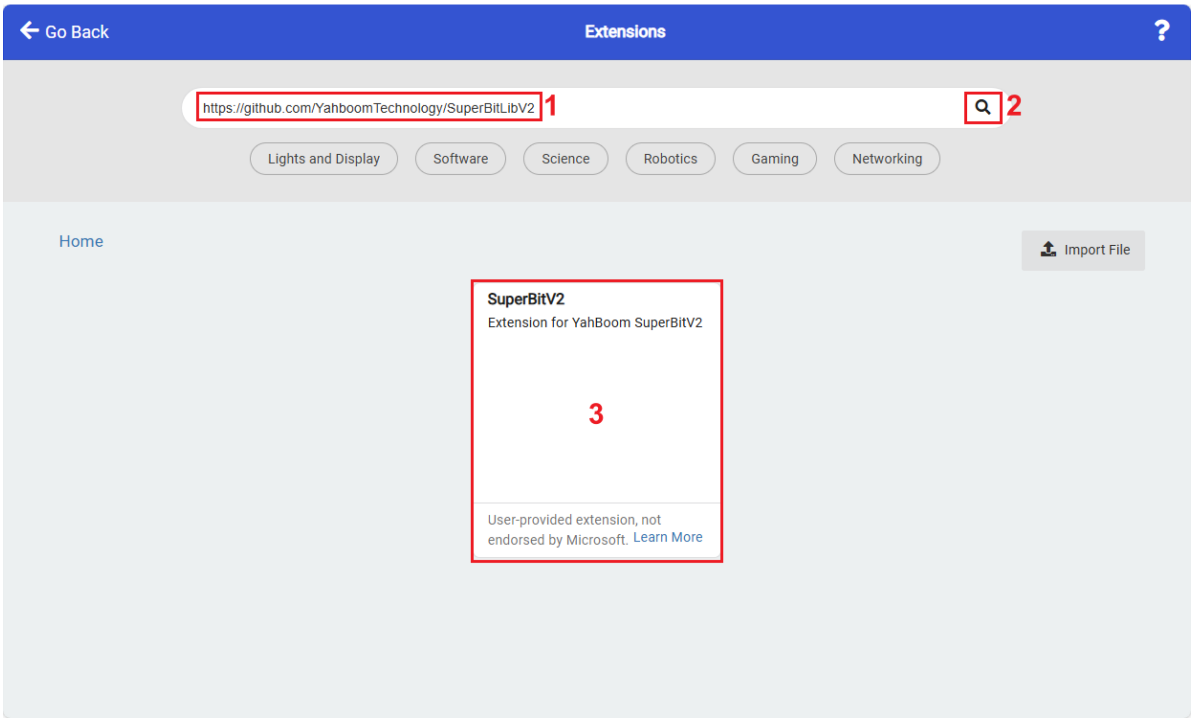
Method 2 Offline programming:

Open the offline programming software MakeCode and enter the programming interface. Click [New] and add the Yahboom software package to start programming.

superbit kit expansion package: https://github.com/YahboomTechnology/SuperBitLibV2
handle expansion package: https://github.com/YahboomTechnology/GHBitLib

4.1 Add expansion package

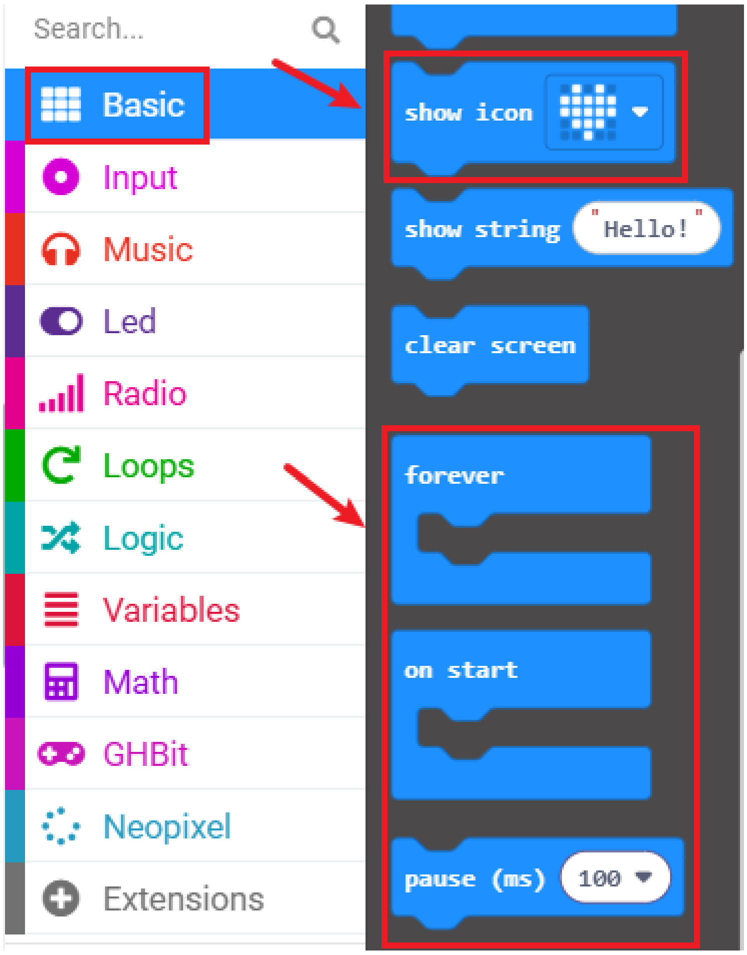


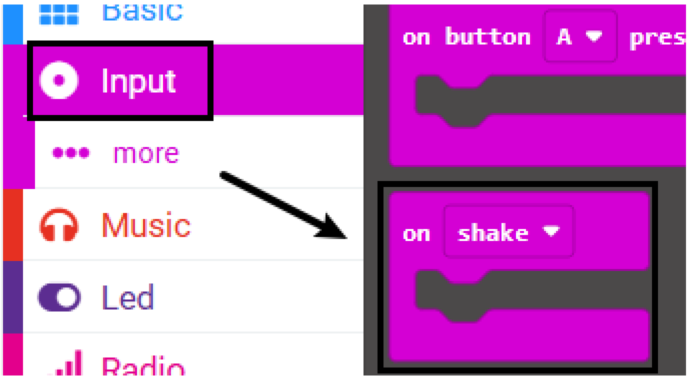


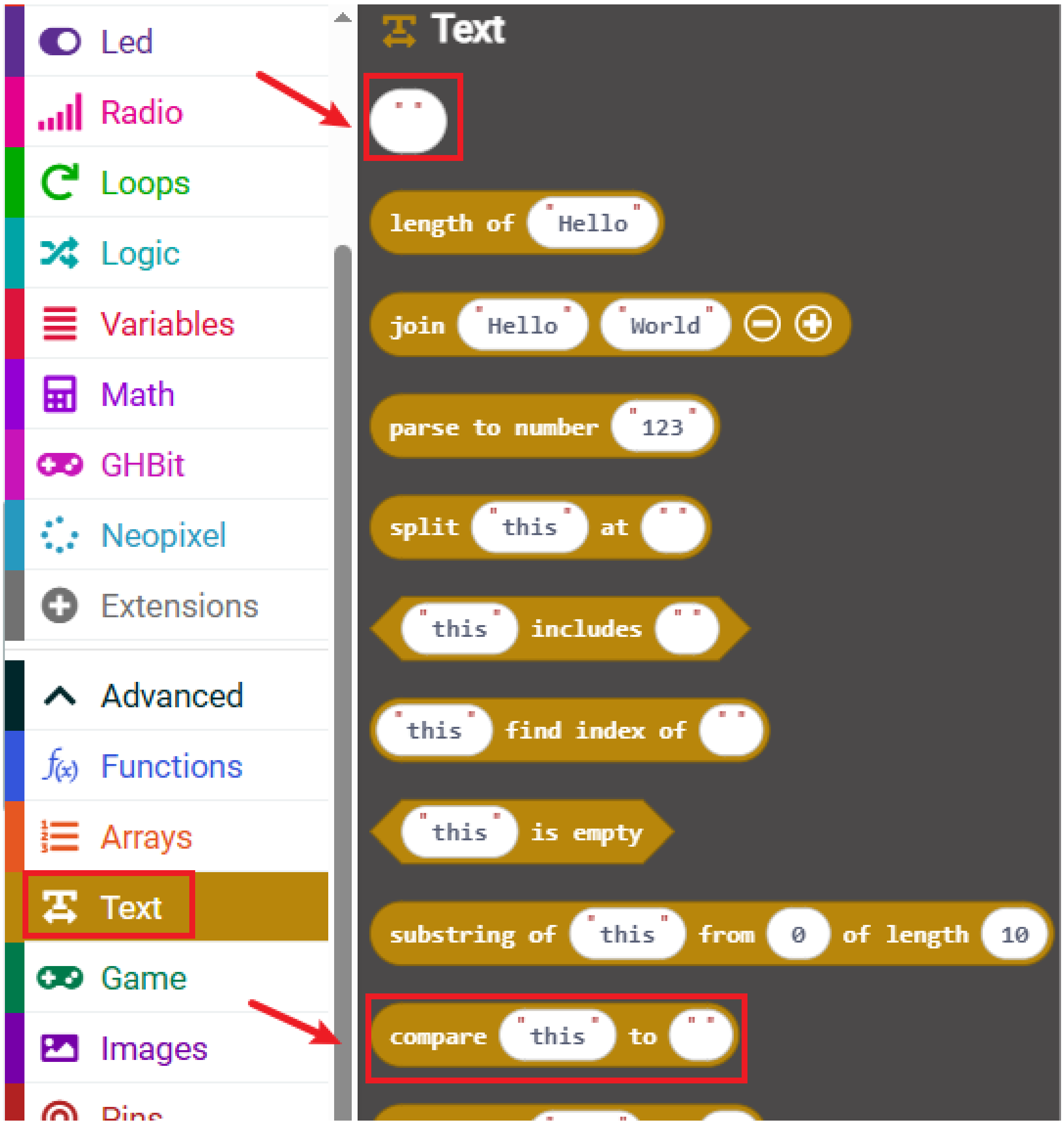
Go Back
Extensions
?
https://github.com/YahboomTechnology/SuperBitLibV2
1
2
Lights and Display
Software
Science
Robotics
Gaming
Networking
Home
Import File
SuperBitV2
Extension for YahBoom SuperBitV2
3
User-provided extension, not endorsed by Microsoft. Learn More

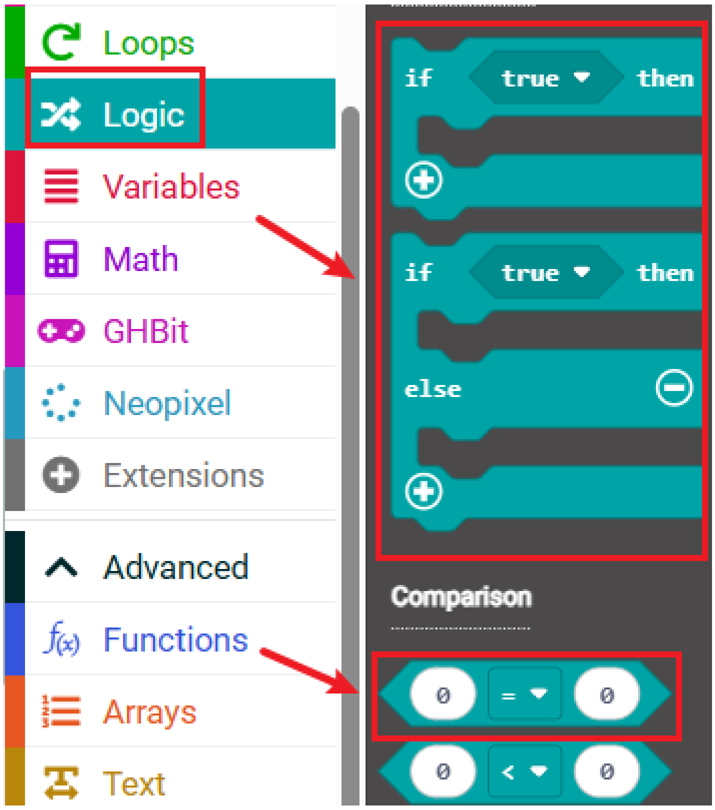
4.2 Building blocks used

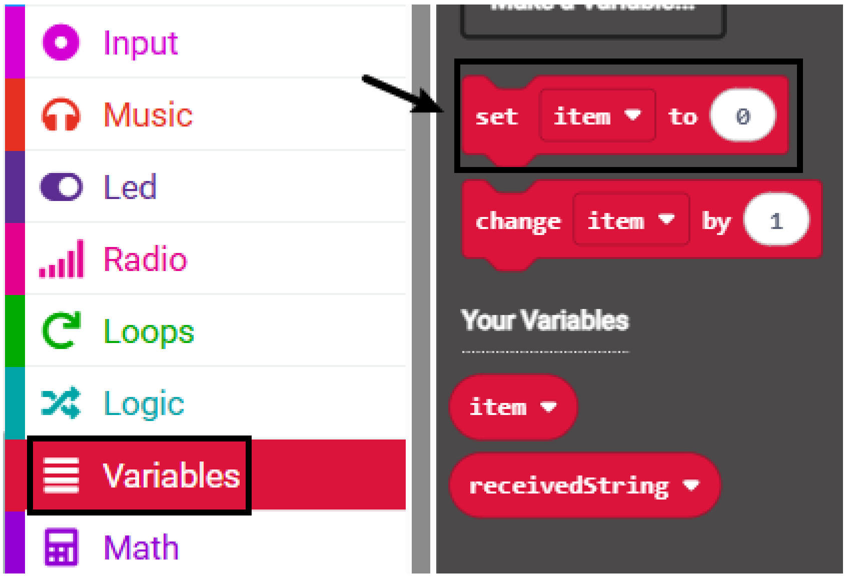
The location of the building blocks required for this programming is shown in the figure below.

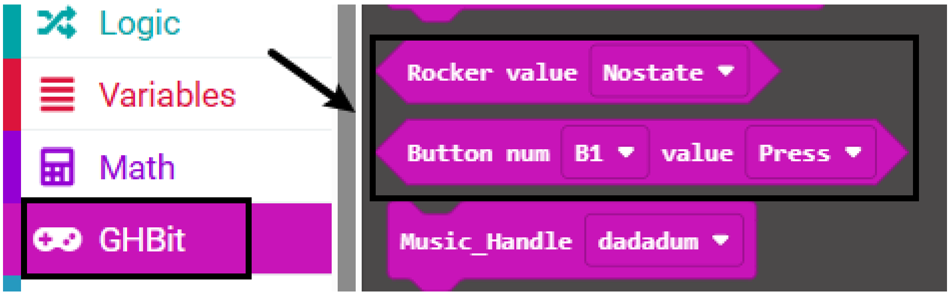


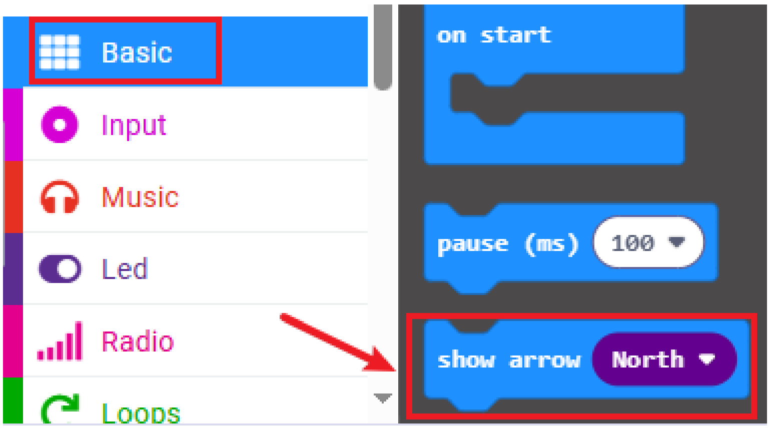

Basic
Input
more
Music
Led
Radio
on button A pres
on shake

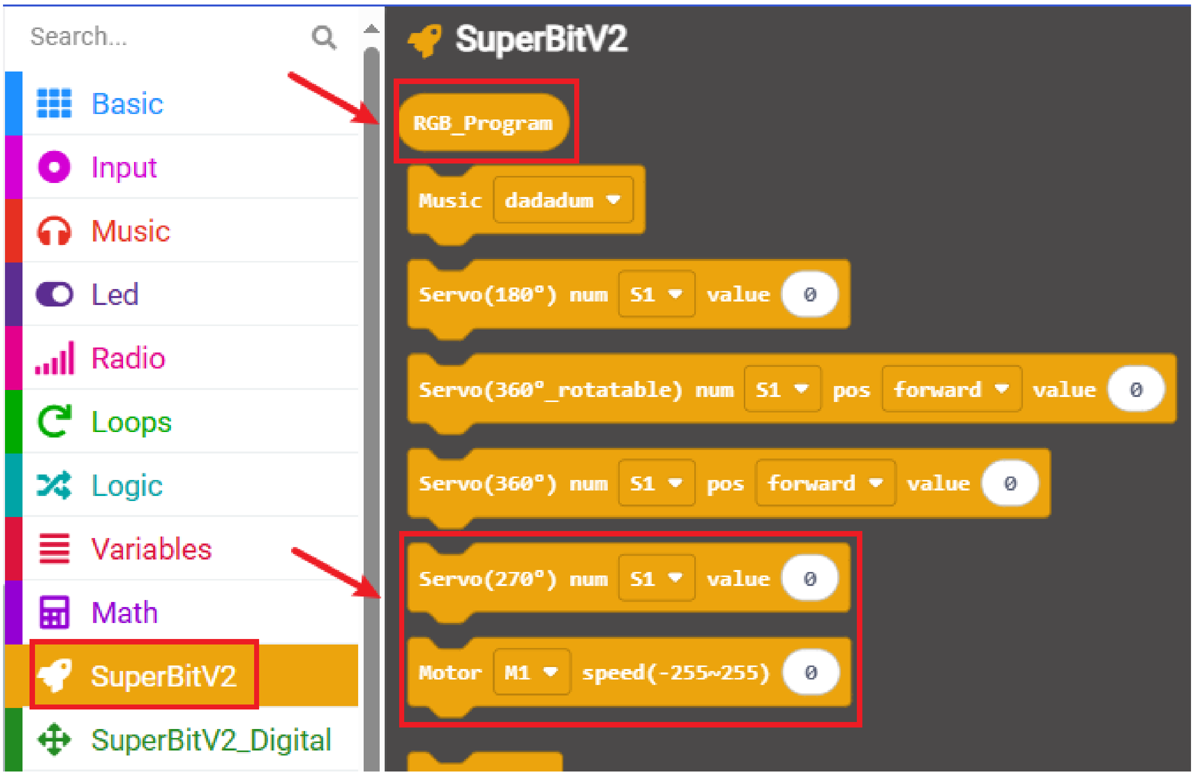

Led
Radio
Loops
Logic
Variables
Math
GHBit
Neopixel
Extensions
Advanced
Functions
Arrays
Text
Game
Images
Pins
Text
" "
length of "Hello"
join "Hello" "World"
parse to number "123"
split "this" at " "
"this" includes " "
"this" find index of " "
"this" is empty
substring of "this" from 0 of length 10
compare "this" to " "

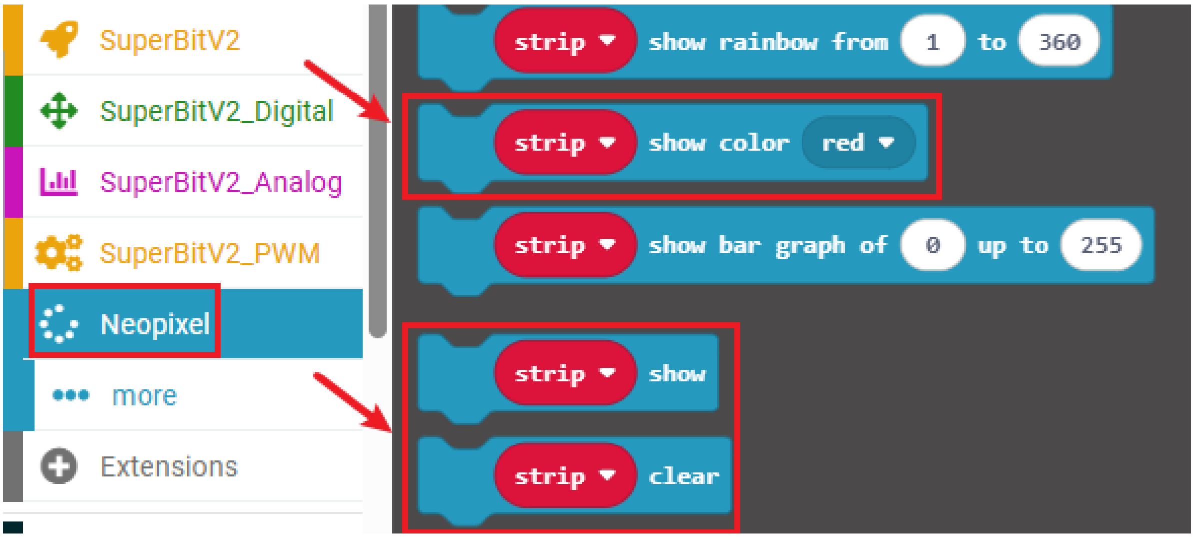

Loops
Logic
Variables
Math
GHBit
Neopixel
Extensions
Advanced
Functions
Arrays
Text
if true then
if true then
else
Comparison
0 = 0
0 < 0

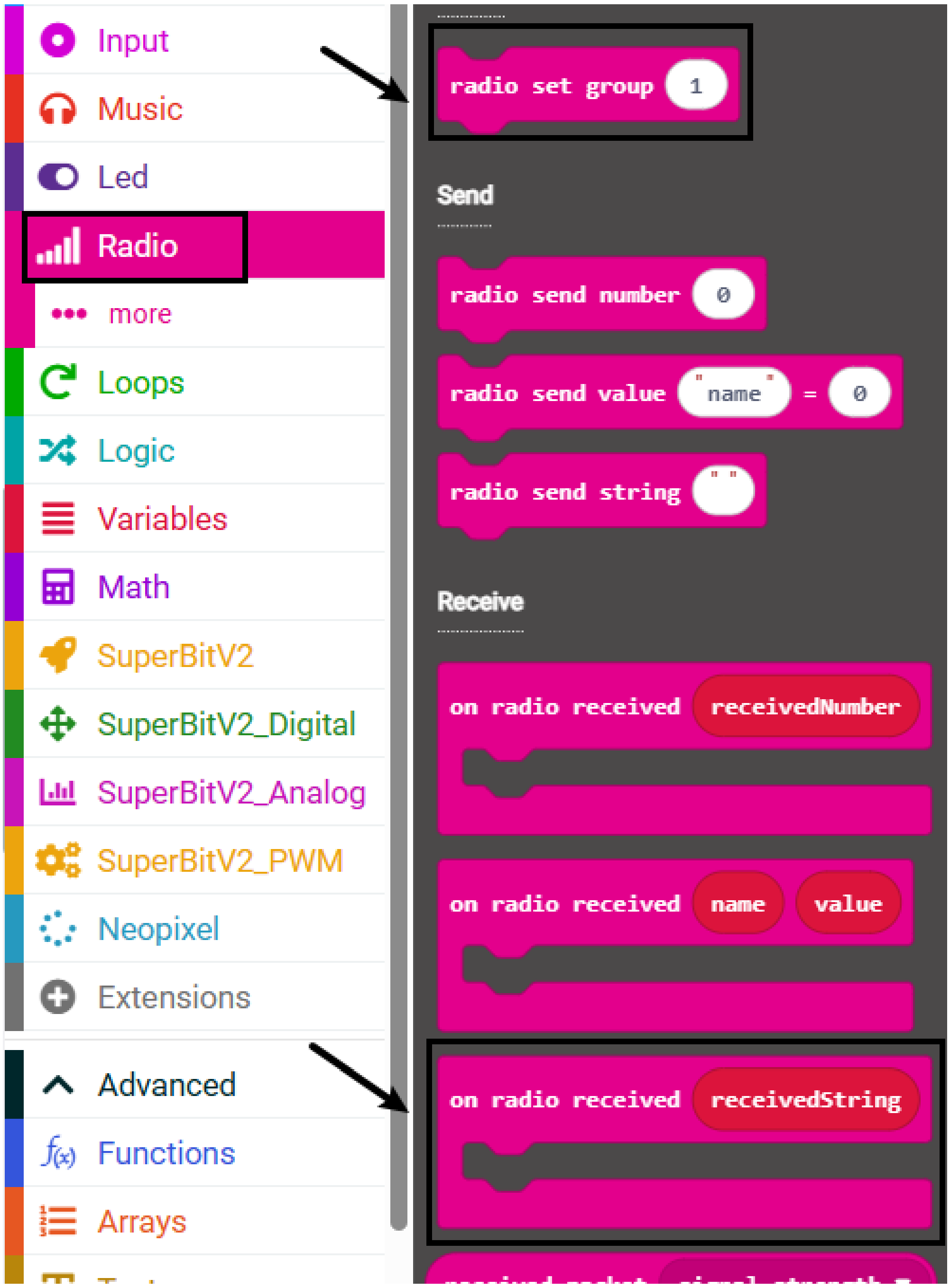

Input
Music
Led
Radio
Loops
Logic
Variables
Math
set item to 0
change item by 1
Your Variables
item
receivedString

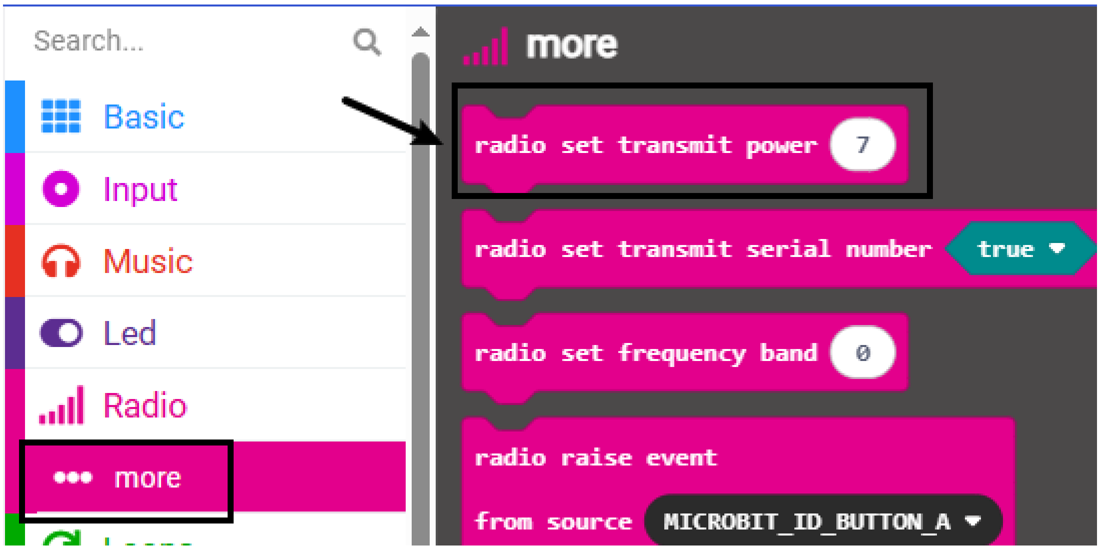

Logic
Variables
Math
GHBit
Rocker value Nostate
Button num B1 value Press
Music_Handle dadadum


Basic
Input
Music
Led
Radio
Loops
on start
pause (ms) 100
show arrow North


Search...
Basic
Input
Music
Led
Radio
Loops
Logic
Variables
Math
SuperBitV2
SuperBitV2_Digital
SuperBitV2
RGB_Program
Music dadadum
Servo(180°) num S1 value 0
Servo(360°_rotatable) num S1 pos forward value 0
Servo(360°) num S1 pos forward value 0
Servo(270°) num S1 value 0
Motor M1 speed(-255~255) 0

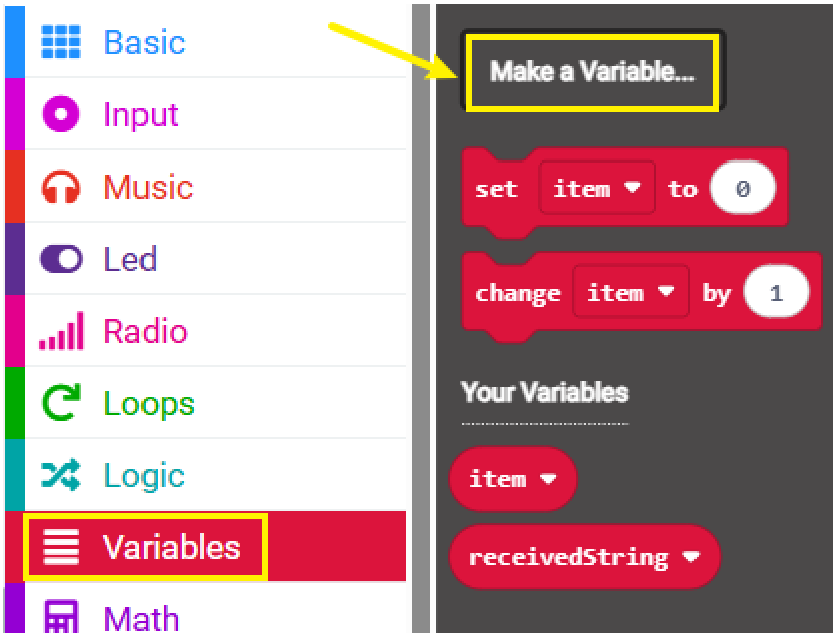

SuperBitV2
SuperBitV2_Digital
SuperBitV2_Analog
SuperBitV2_PWM
Neopixel
more
Extensions
strip show rainbow from 1 to 360
strip show color red
strip show bar graph of 0 up to 255
strip show
strip clear


Input
Music
Led
Radio
more
Loops
Logic
Variables
Math
SuperBitV2
SuperBitV2_Digital
SuperBitV2_Analog
SuperBitV2_PWM
Neopixel
Extensions
Advanced
Functions
Arrays
radio set group 1
Send
radio send number 0
radio send value "name" = 0
radio send string " "
Receive
on radio received receivedNumber
on radio received name value
on radio received receivedString

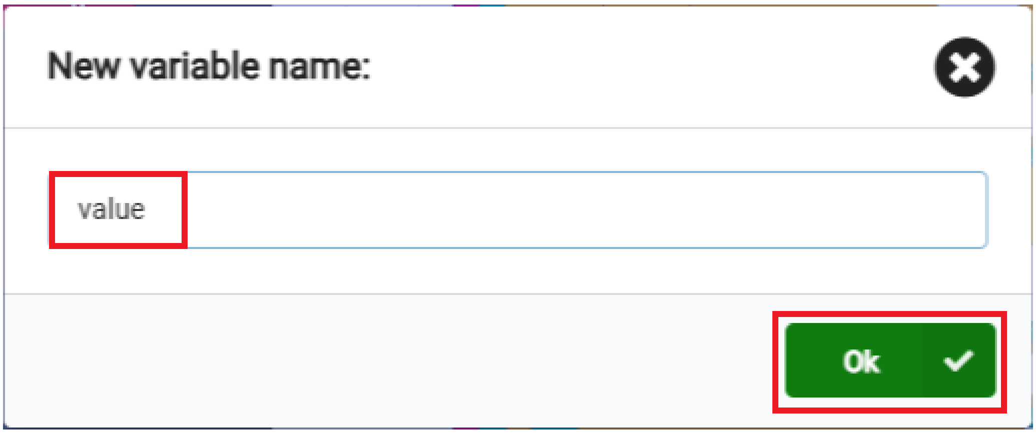

Search...
Basic
Input
Music
Led
Radio
more
more
radio set transmit power 7
radio set transmit serial number true
radio set frequency band 0
radio raise event
from source MICROBIT_ID_BUTTON_A

4.3 Add new variables

① Find the [Variable] option in the building block bar ---- [Set variable]

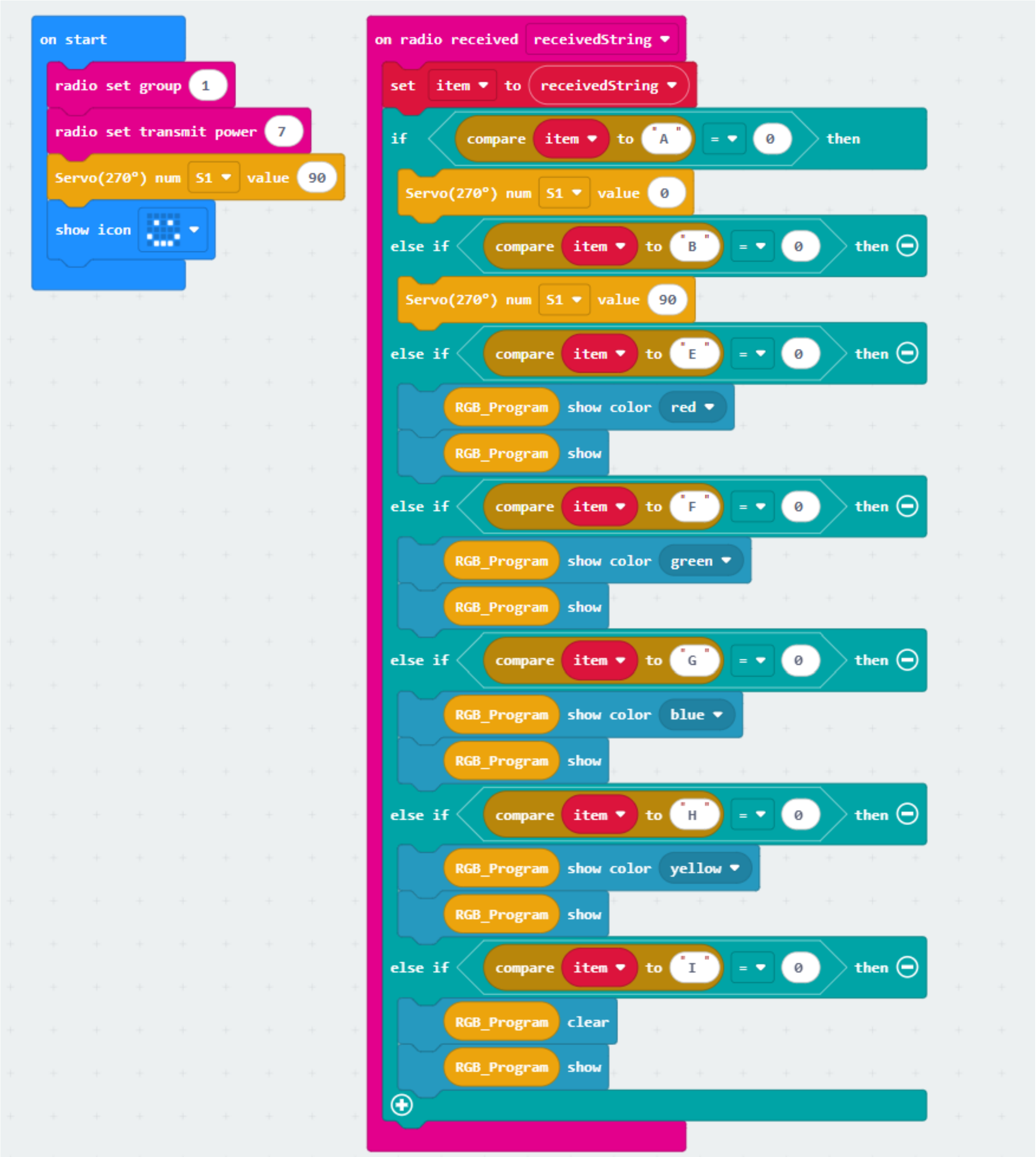


② Enter the variable name to complete the new variable.



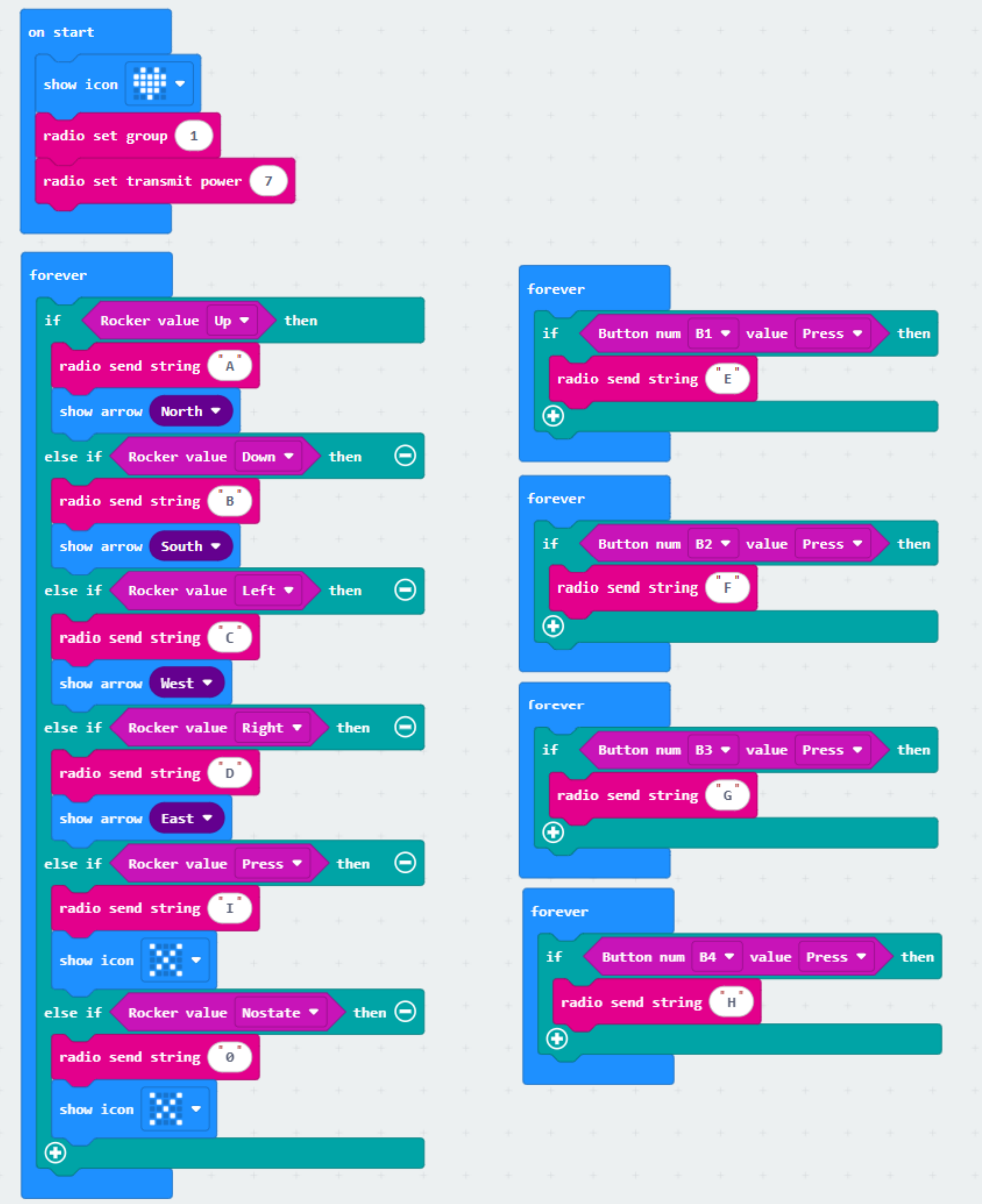
4.4 Combined blocks

The microbit summary program on the **Lifting platform** is shown in the figure below



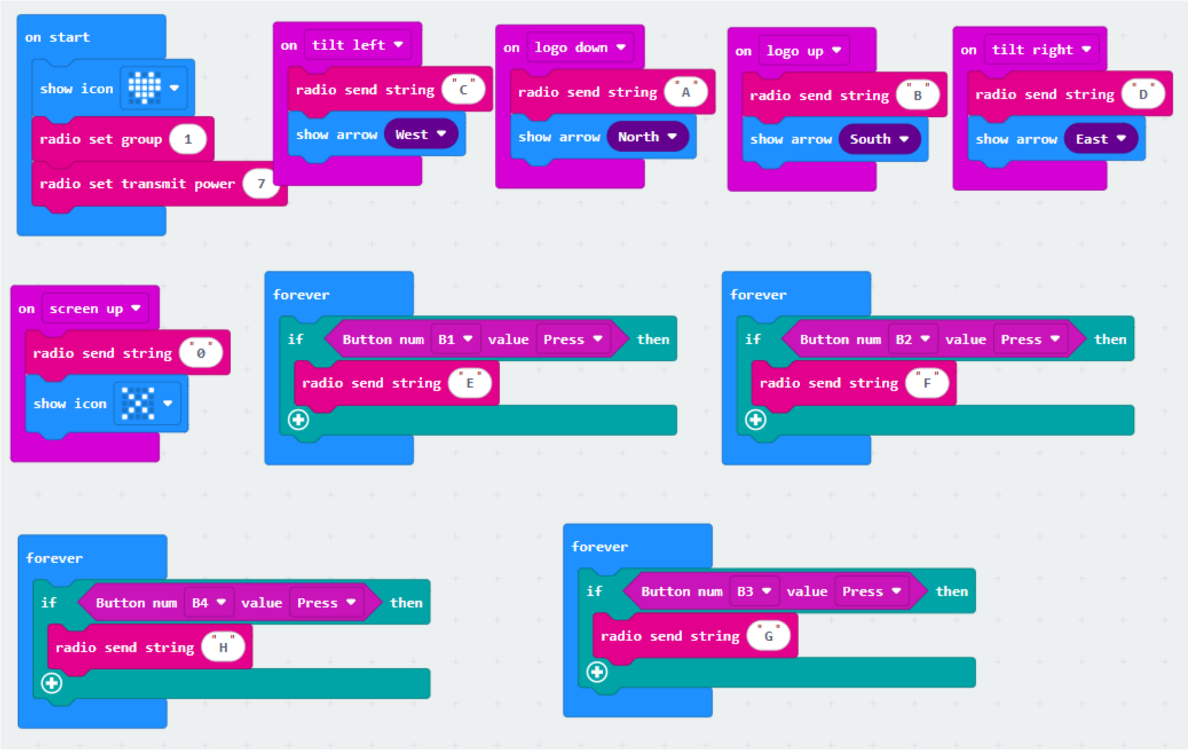
```
on start
    radio set group 1
    radio set transmit power 7
    Servo(270°) num S1 value 90
    show icon

on radio received receivedString
    set item to receivedString
    if compare item to "A" = 0 then
        Servo(270°) num S1 value 0
    else if compare item to "B" = 0 then
        Servo(270°) num S1 value 90
    else if compare item to "E" = 0 then
        RGB_Program show color red
        RGB_Program show
    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
        RGB_Program clear
        RGB_Program show
```

The **Handle rocker control** program is as follows



```
on start
    show icon
    radio set group 1
    radio set transmit power 7

forever
    if Rocker value Up then
        radio send string "A"
        show arrow North
    else if Rocker value Down then
        radio send string "B"
        show arrow South
    else if Rocker value Left then
        radio send string "C"
        show arrow West
    else if Rocker value Right then
        radio send string "D"
        show arrow East
    else if Rocker value Press then
        radio send string "I"
        show icon
    else if Rocker value Nostate then
        radio send string "0"
        show icon

forever
    if Button num B1 value Press then
        radio send string "E"

forever
    if Button num B2 value Press then
        radio send string "F"

forever
    if Button num B3 value Press then
        radio send string "G"

forever
    if Button num B4 value Press then
        radio send string "H"
```

The **Handle gravity control** program is as follows



```
on start
    show icon
    radio set group 1
    radio set transmit power 7

on tilt left
    radio send string "C"
    show arrow West

on logo down
    radio send string "A"
    show arrow North

on logo up
    radio send string "B"
    show arrow South

on tilt right
    radio send string "D"
    show arrow East

on screen up
    radio send string "0"
    show icon

forever
    if Button num B1 value Press then
        radio send string "E"

forever
    if Button num B2 value Press then
        radio send string "F"

forever
    if Button num B4 value Press then
        radio send string "H"

forever
    if Button num B3 value Press then
        radio send string "G"
```

You can also directly open the **microbit-handle-control-Lifting-platform.hex, microbit-Handle-rocker-control.hex, microbit-Handle-gravity-control.hex** files provided in this experiment and drag them into the browser that opens the URL, and the program diagram of this project source code will be automatically opened

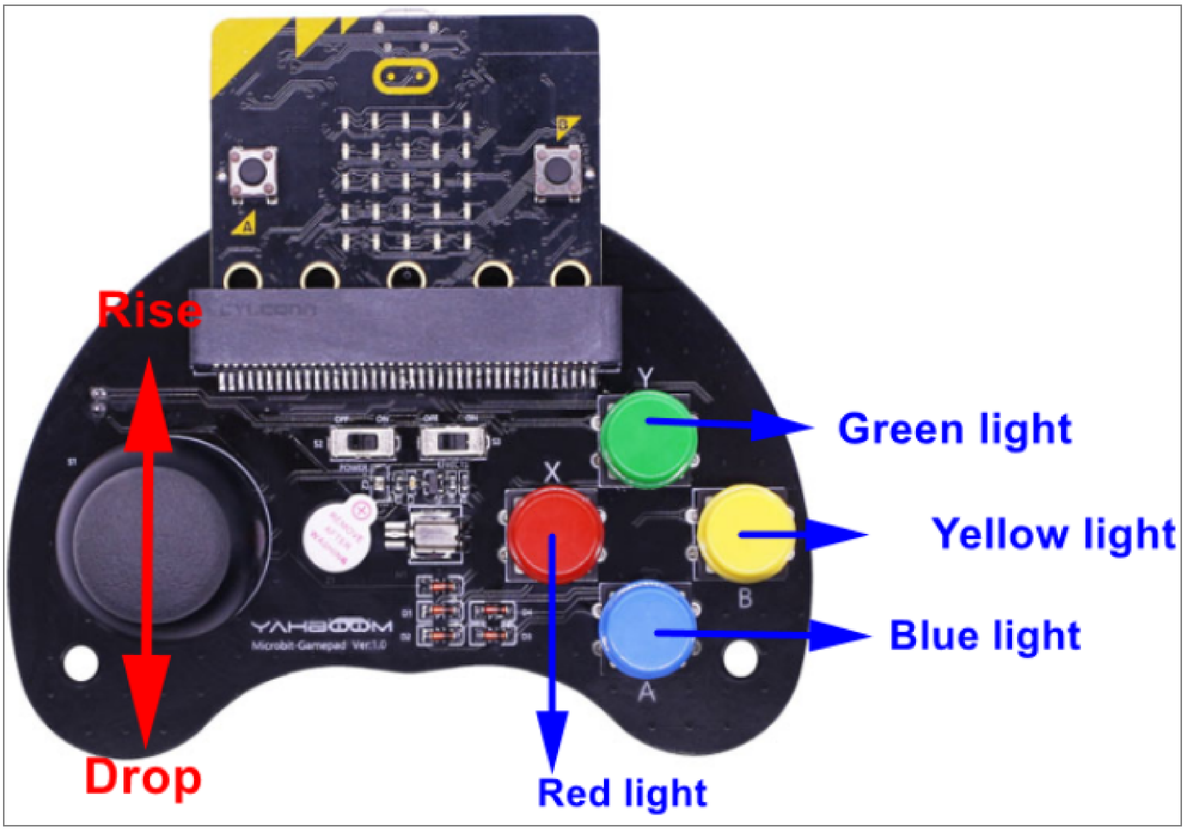
5. Experimental phenomenon

We need to download the Lifting platform program to the micro:bit motherboard of the Lifting platform, turn on the power switch of the Lifting platform, and we can see a smiley face pattern displayed on the micro:bit dot matrix;

Download the handle remote control program to the micro:bit motherboard of the handle, turn on the power switch of the handle, and we can see that the micro:bit dot matrix will be initialized to display a heart pattern, and then an "X" pattern will be displayed, indicating that the handle is in the default state and no data is sent.

The two will automatically pair, and then we can start remotely controlling the Lifting platform.

The handle functions are as follows.


Rise
Drop
Green light
Yellow light
Blue light
Red light
Y
X
B
A
YAHBOOM
Microbit-Gamepad Ver:1.0