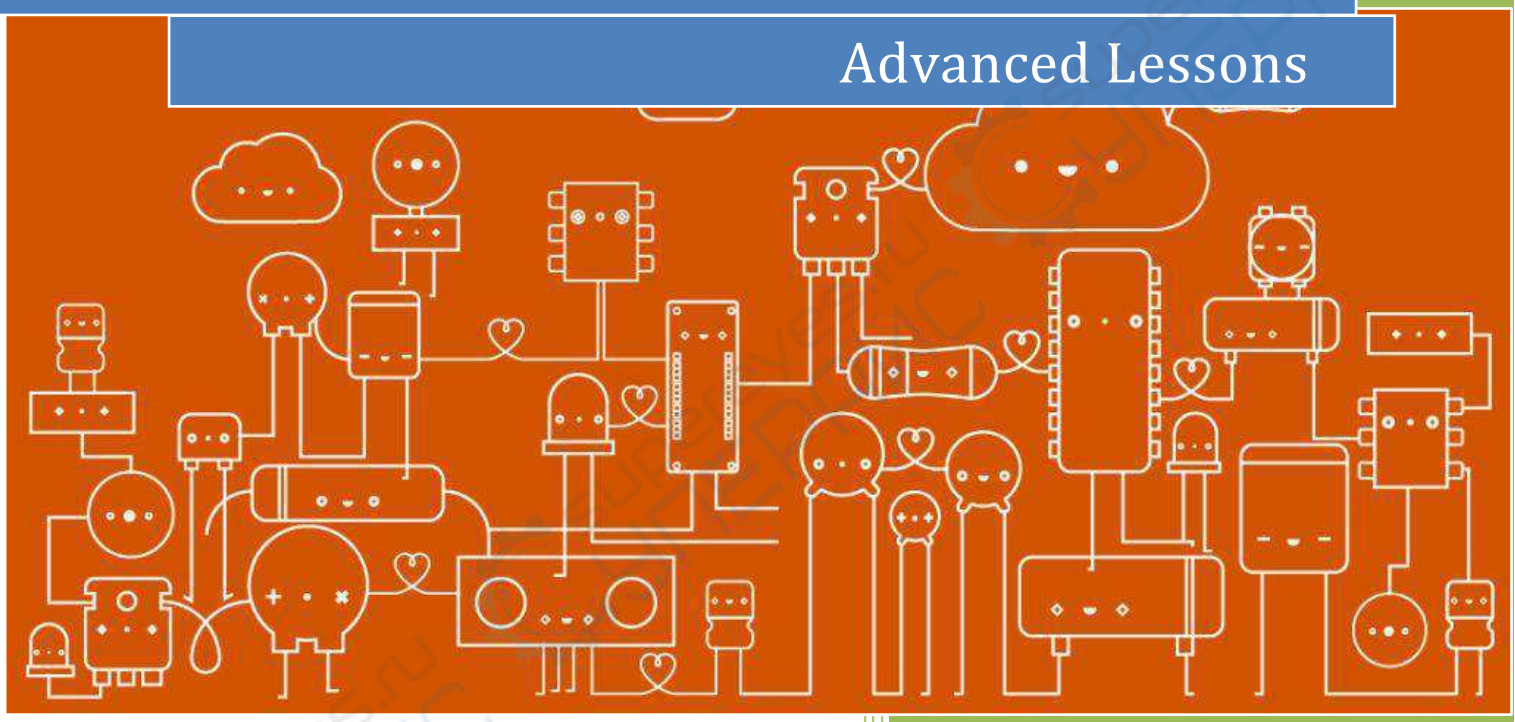
2019

Micro:bit Smart Robot Car

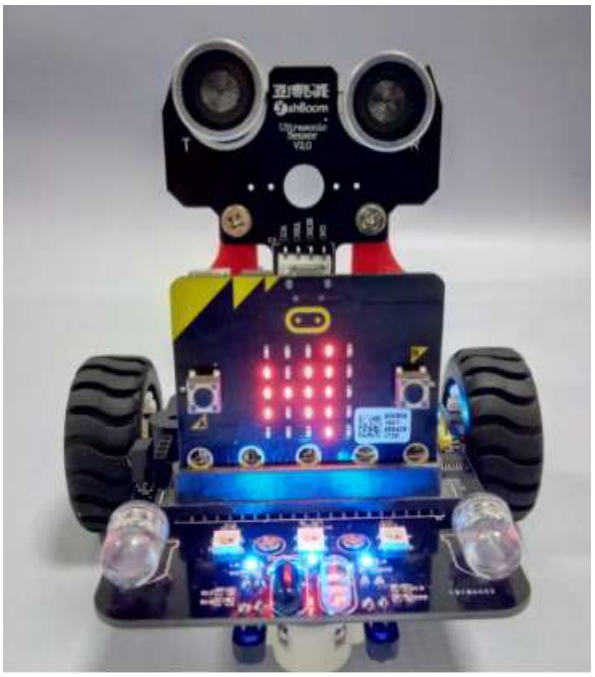
Advanced Lessons



Advanced Lessons

Lesson 1 Buzzer singing

1.Learning goals



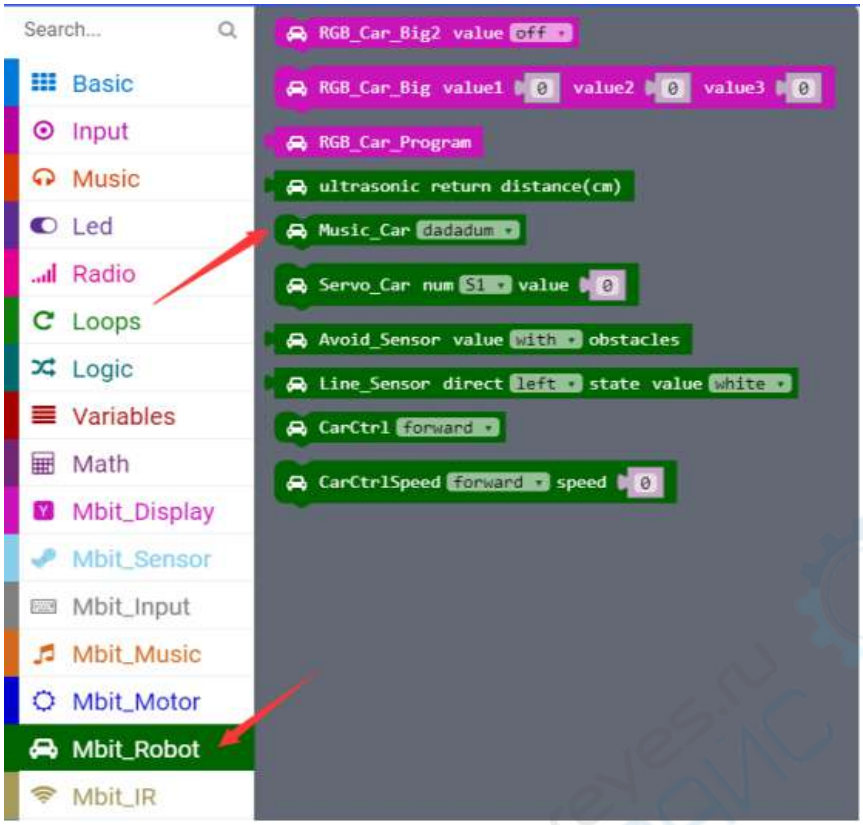
After you download the program, you can hear the car robot start singing “Happy Birthday”. And micro:bit has a buzzer logo on it, which flashes together while singing.

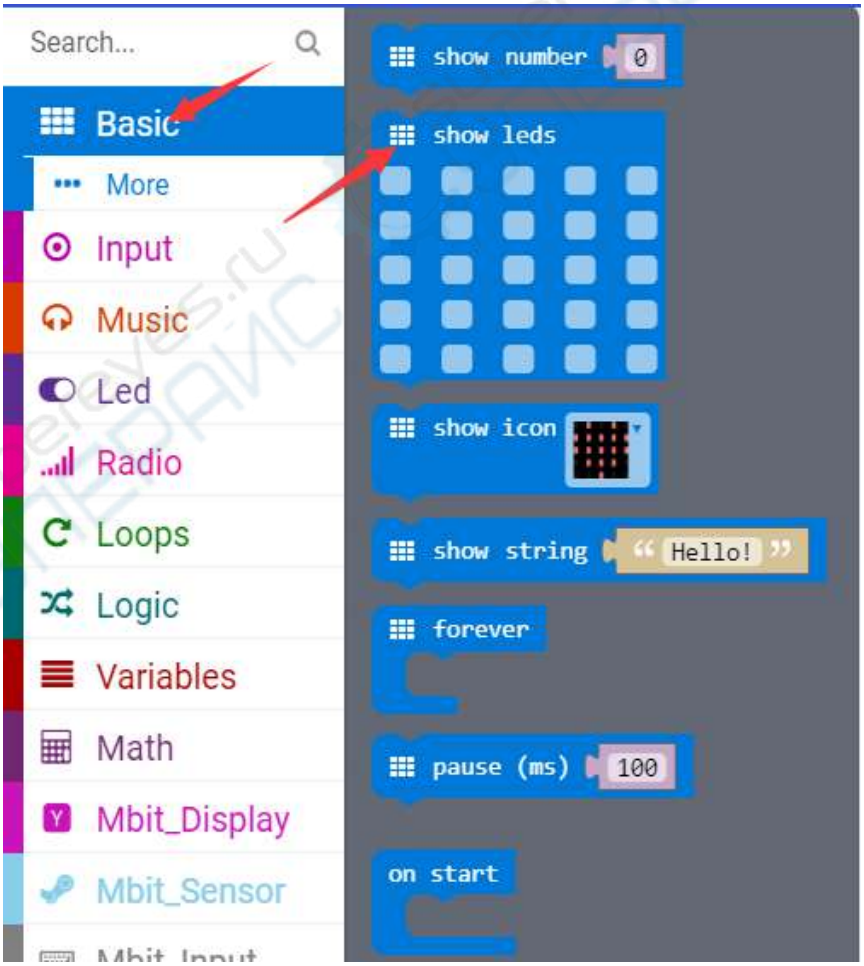
2.Preparation

1 X USB cable
1 X micro:bit robot

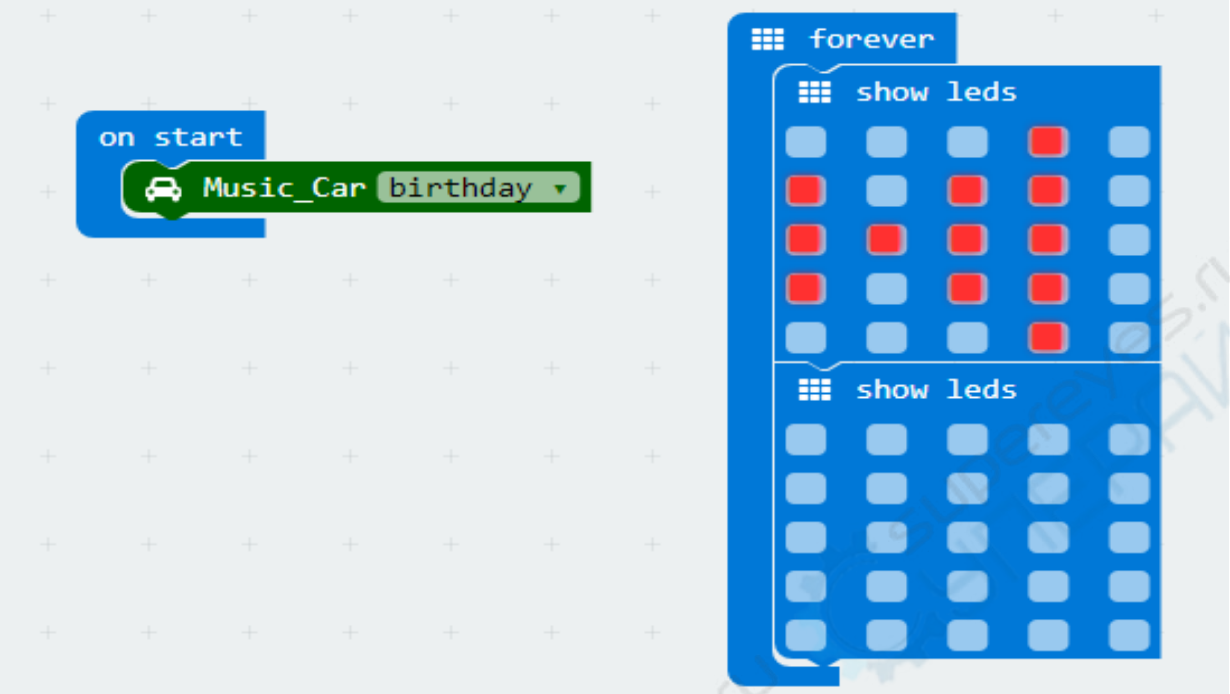
Then the micro:bit is connected to the computer through USB, and the computer will pop up a U disk and click the URL in the U disk to enter the programming interface. Input this URL https://github.com/lzty634158/yahboom_mbit_en to get the package.

3.Search for blocks





4.Combine blocks



Lesson 2 “Craftsman music”

1.Learning goals

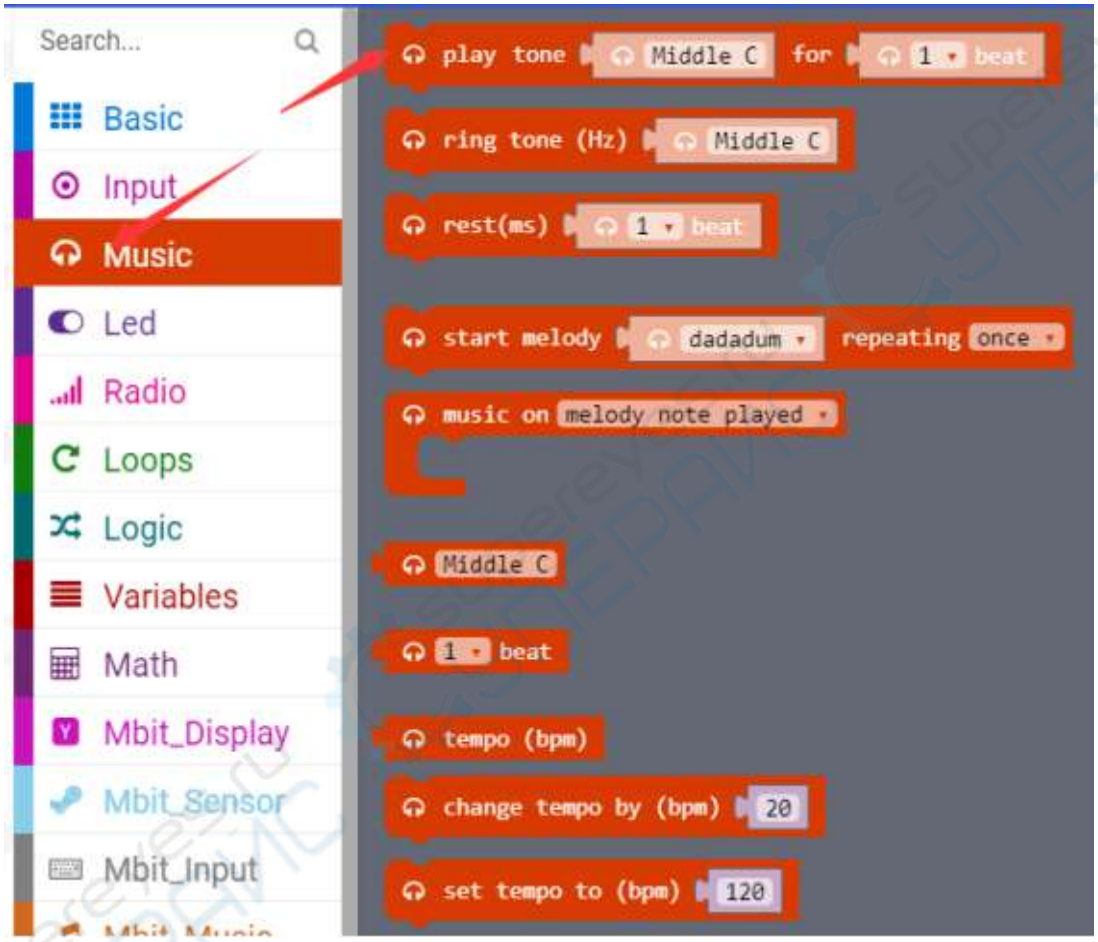
After you download the program, you can hear the robot’s buzzer play the music we’ve written, the painter. And there is a note pattern on the micro:bit dot matrix. As long as we search for music from the Internet, we can compose other songs.

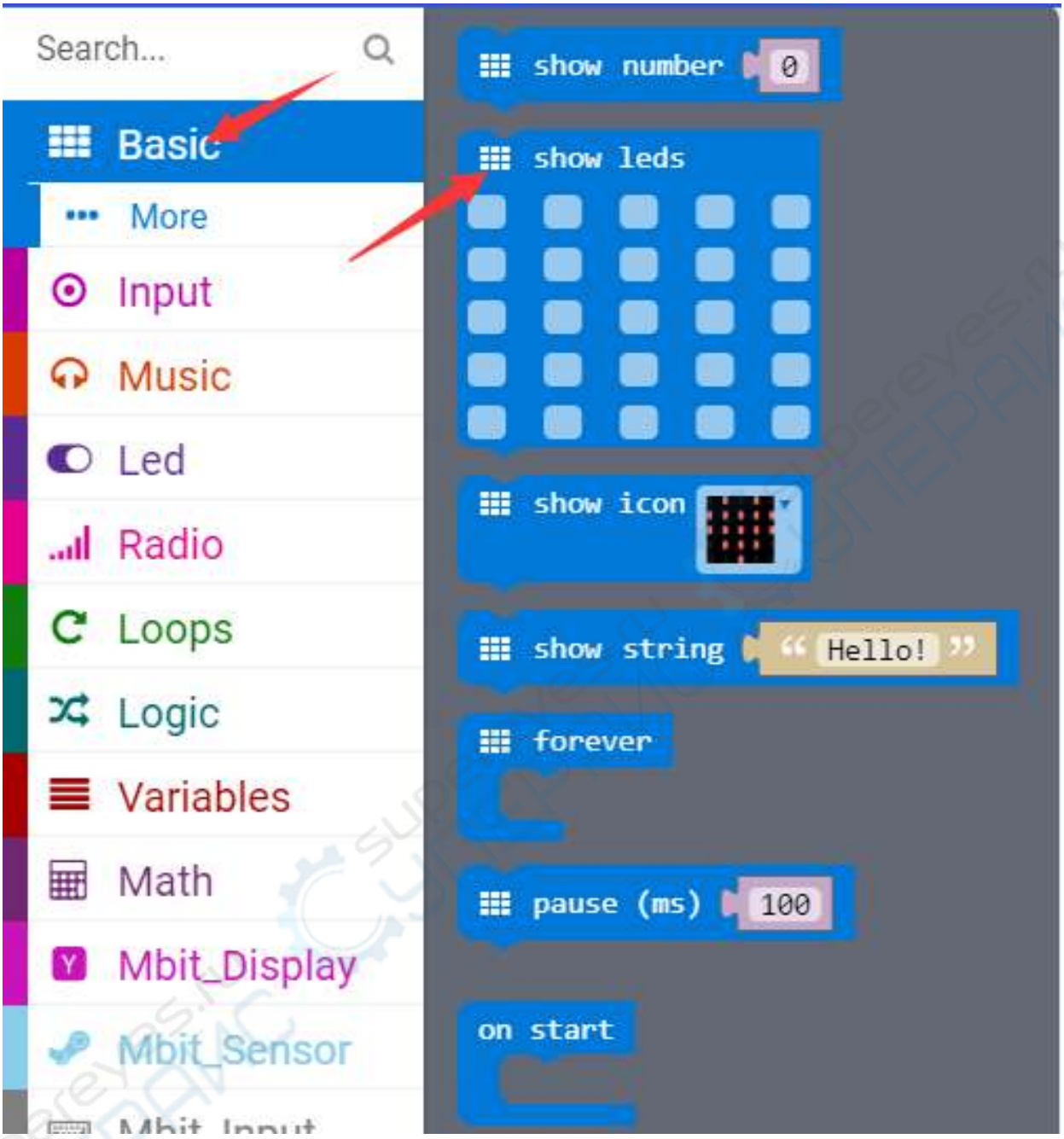
2.Hardware

1 X USB cable
1 X micro:bit robot

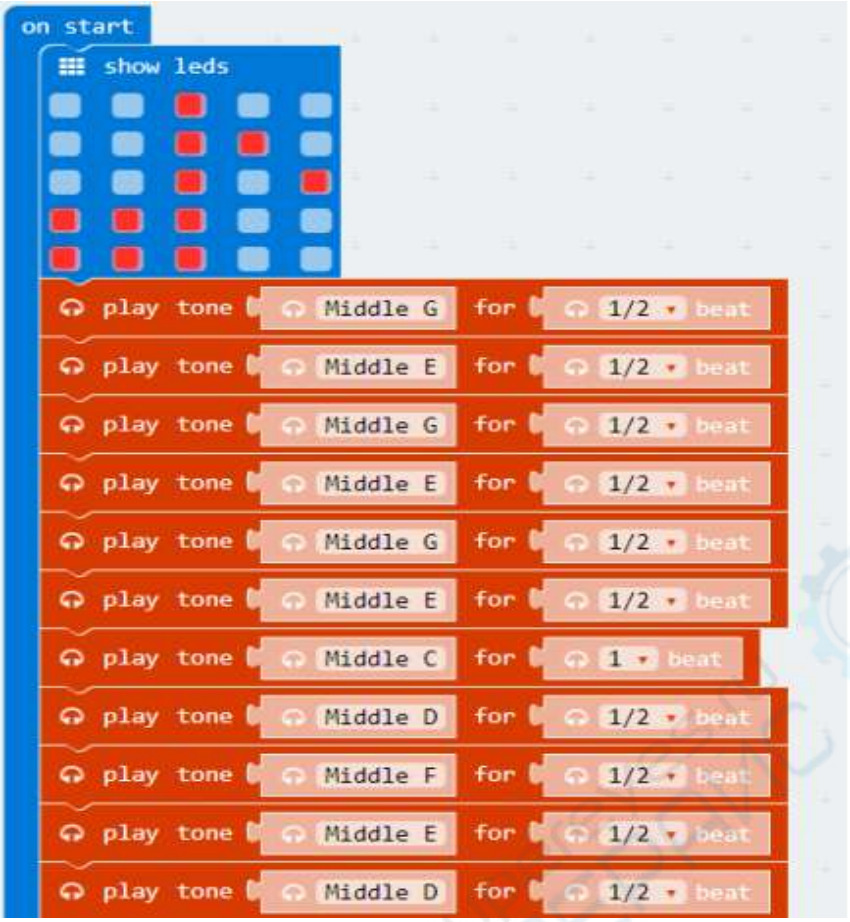
Then the micro:bit is connected to the computer through USB, and the computer will pop up a U disk and click the URL in the U disk to enter the programming interface. Input this URL https://github.com/lzty634158/yahboom_mbit_en to get the package.

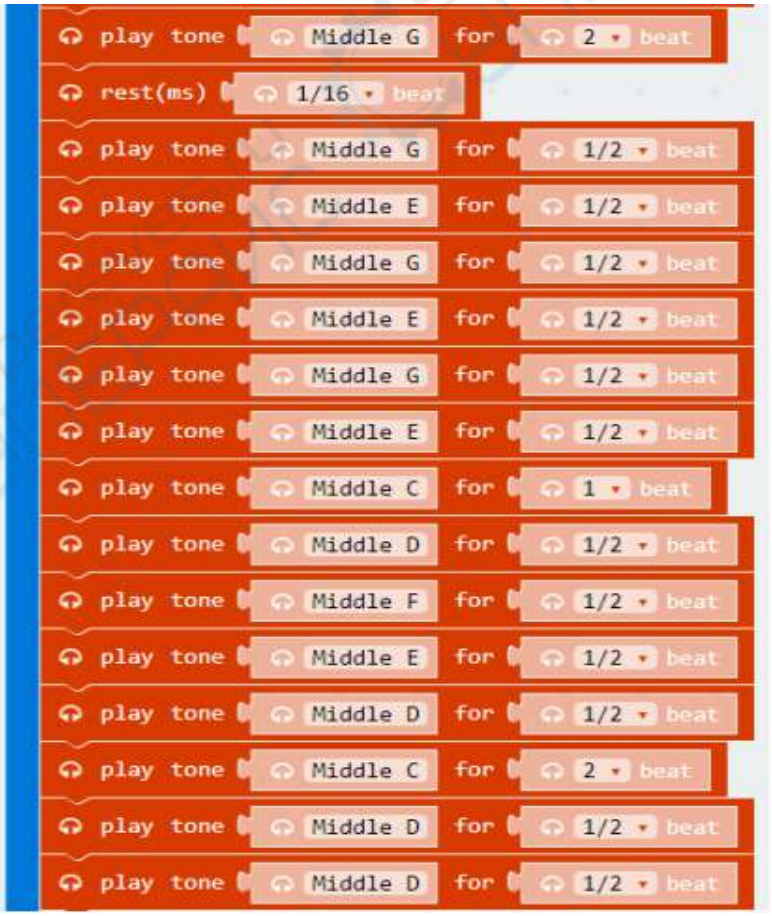
3.Search for blocks




Search...
Basic
More
Input
Music
Led
Radio
Loops
Logic
Variables
Math
Mbit_Display
Mbit_Sensor
show number 0
show leds
show icon
show string Hello!
forever
pause (ms) 100
on start

4.Combine blocks






play tone Middle F for 1/2 beat
play tone Middle F for 1/2 beat
play tone Middle E for 1/2 beat
play tone Middle C for 1/2 beat
play tone Middle G for 1 beat
play tone Middle D for 1/2 beat
play tone Middle F for 1/2 beat
play tone Middle E for 1/2 beat
play tone Middle D for 1/2 beat
play tone Middle G for 2 beat
rest(ms) 1/16 beat


play tone Middle G for 1/2 beat
play tone Middle E for 1/2 beat
play tone Middle G for 1/2 beat
play tone Middle E for 1/2 beat
play tone Middle G for 1/2 beat
play tone Middle E for 1/2 beat
play tone Middle C for 1 beat
play tone Middle D for 1/2 beat
play tone Middle F for 1/2 beat
play tone Middle E for 1/2 beat
play tone Middle D for 1/2 beat
play tone Middle C for 1 beat

5.Music score

I'm a painter

1=D $\frac{2}{4}$

5 3 5 3 | 5 3 1 | 2 4 3 2 | 5 - | 5 3 5 3 | 5 3 1 |

2 4 3 2 | 1 - | 2 2 4 4 | 3 1 5 | 2 4 3 2 |

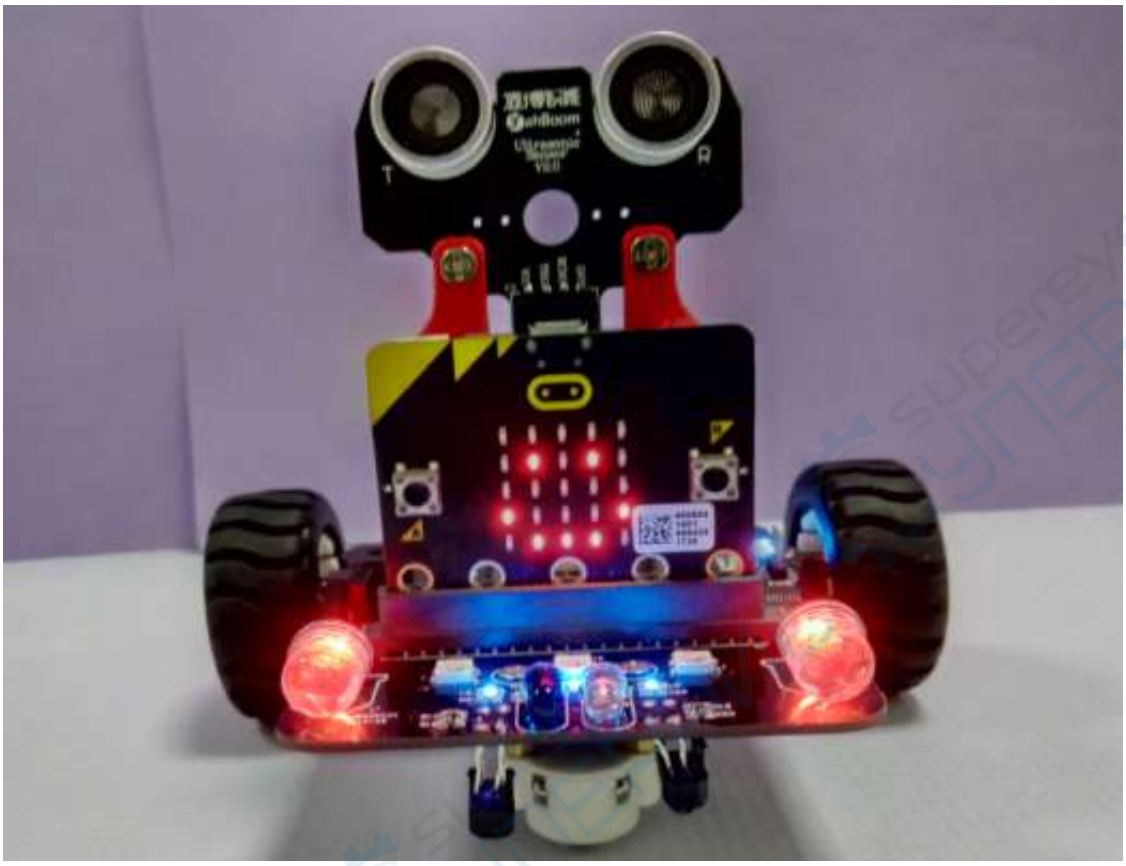
5 - | 5 3 5 3 | 5 3 1 | 2 4 3 2 | 1 - ‖

We turn the numbers in the score into blocks in our program. I have tried many times that the blocks in this song are the best.

After watching the tone, let's get to know the beat again,If the number underlines the underline, we set its beat to be 1/2; if there is a horizontal bar behind the number, we set its beat to 2; if only a single number, the beat is 1; if the song does not hear the pause, we can also put a 1 /16 beat in the middle as a pause.

Lesson 3 “Colorful searchlight”

1.Learning goals



When you download the program, you can see a smile on the car’s dot matrix, and the seven color lights are on, and the children can modify the program to try other colors.

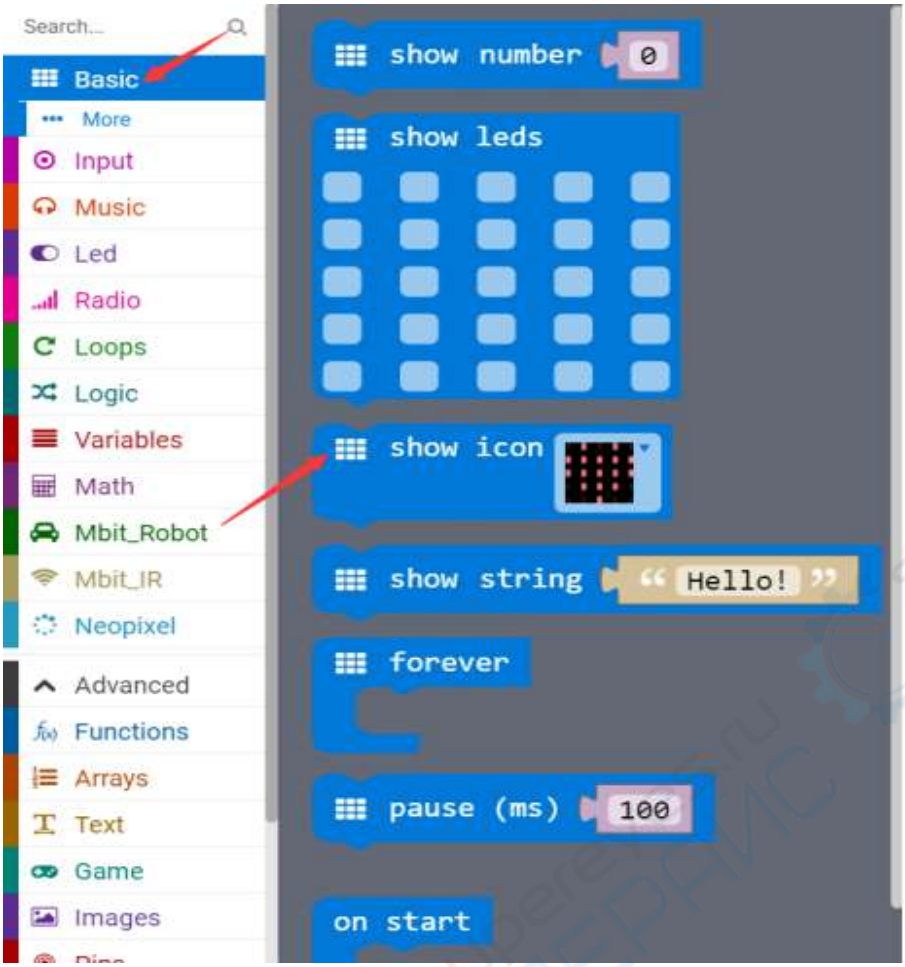
2.Preparation

Hardware:

1 X USB cable
1 X micro:bit robot

Then the micro:bit is connected to the computer through USB, and the computer will pop up a U disk and click the URL in the U disk to enter the programming interface. Input this URL https://github.com/lzty634158/yahboom_mbit_en to get the package.

3.Search for blocks: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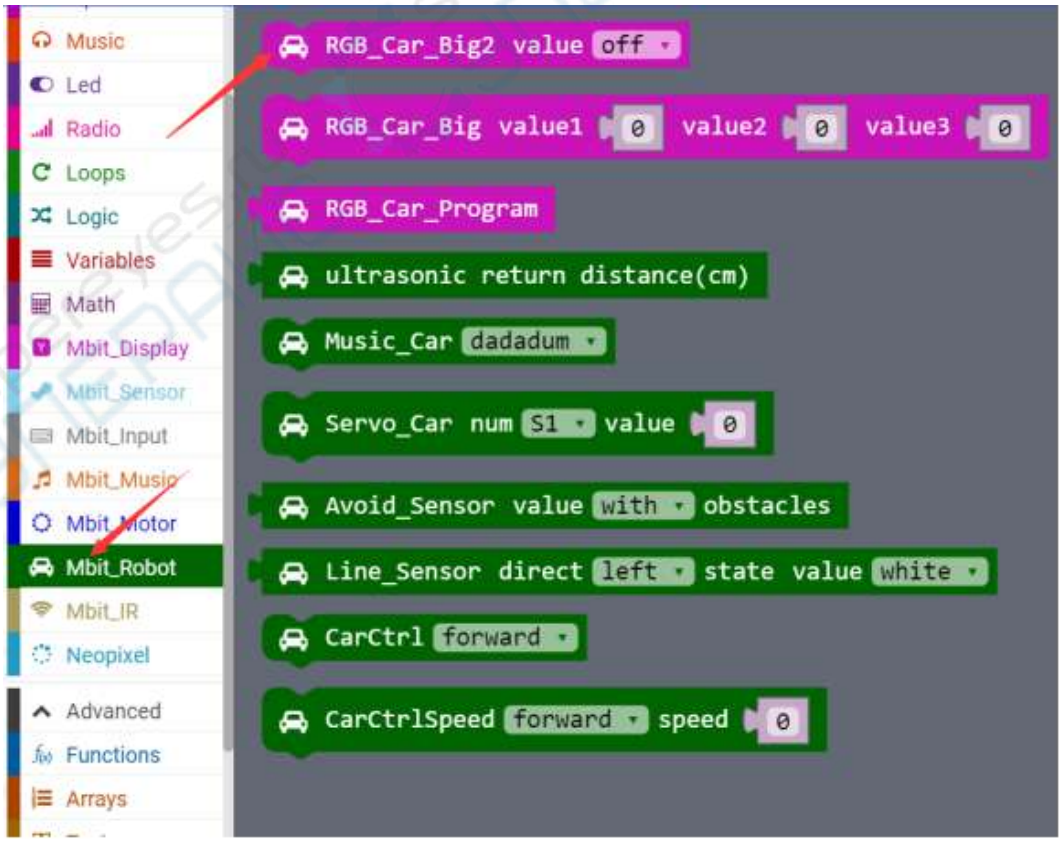
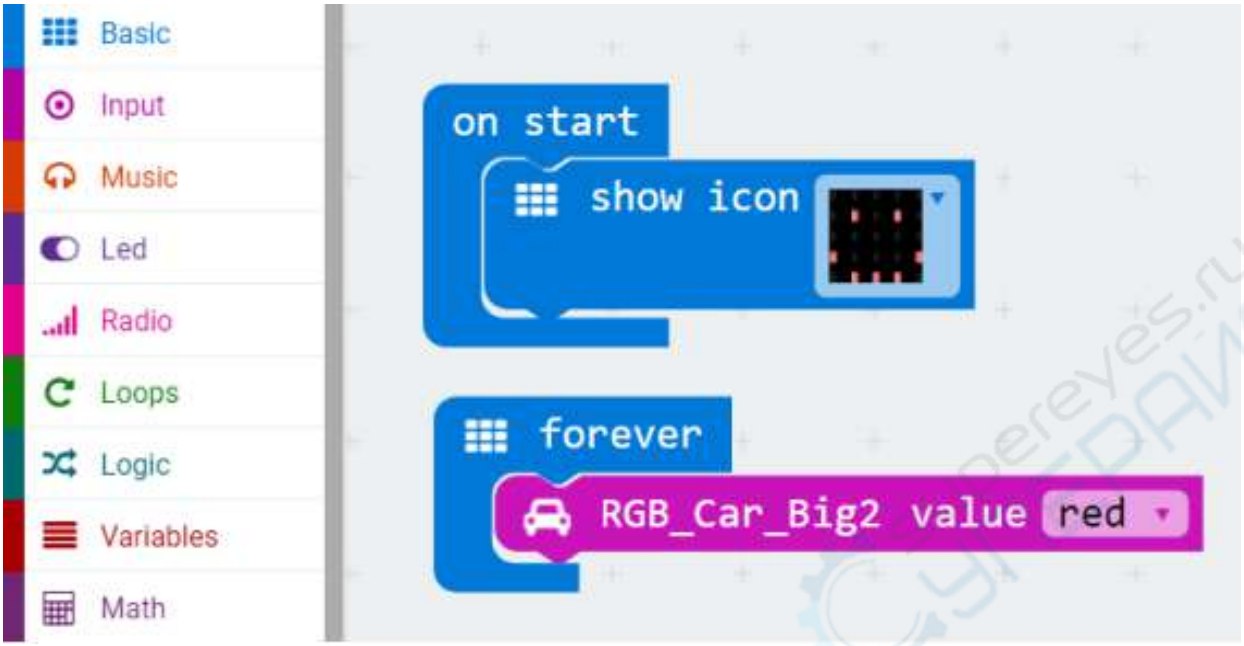
Basic
More
Input
Music
Led
Radio
Loops
Logic
Variables
Math
Mbit_Robot
Mbit_IR
Neopixel
Advanced
Functions
Arrays
Text
Game
Images
show number 0
show leds
show icon
show string Hello!
forever
pause (ms) 100
on start

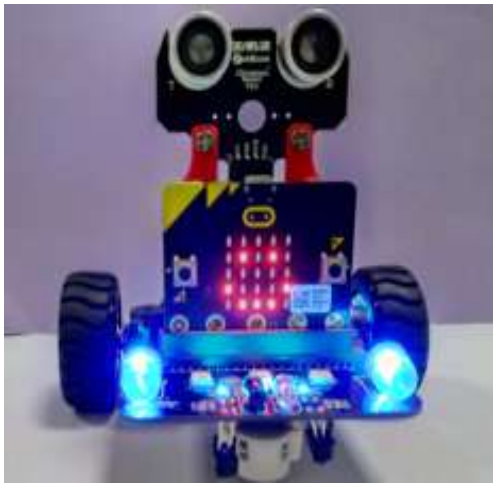

Music
Led
Radio
Loops
Logic
Variables
Math
Mbit_Display
Mbit_Sensor
Mbit_Input
Mbit_Music
Mbit_Motor
Mbit_Robot
Mbit_IR
Neopixel
Advanced
Functions
Arrays
RGB_Car_Big2 value off
RGB_Car_Big value1 0 value2 0 value3 0
RGB_Car_Program
ultrasonic return distance(cm)
Music_Car dadadum
Servo_Car num S1 value 0
Avoid_Sensor value with obstacles
Line_Sensor direct left state value white
CarCtrl forward
CarCtrlSpeed forward speed 0

4.Combine blocks



Lesson 4 “Colorful car light”

1.Learning goals



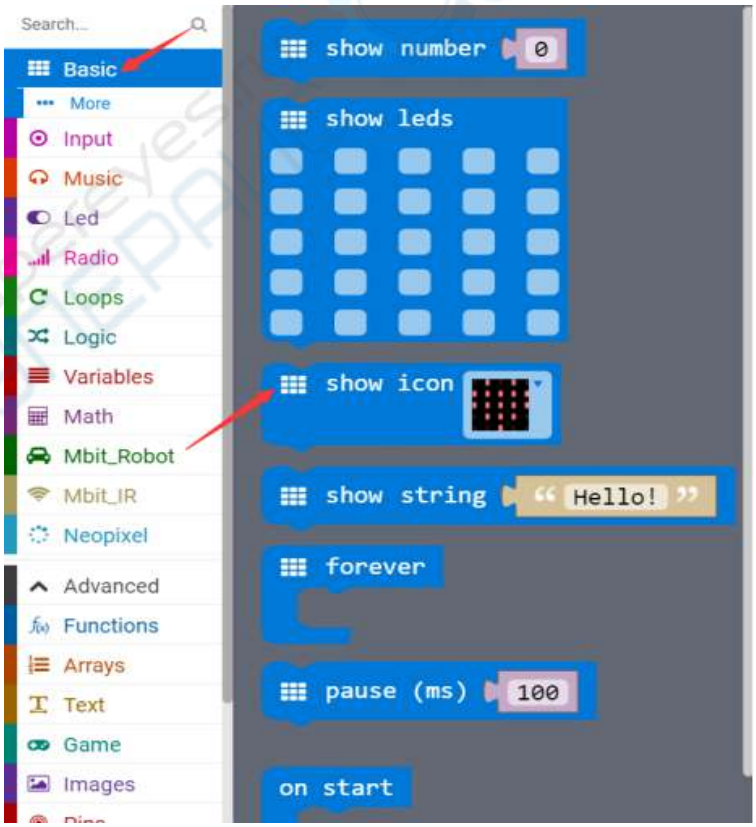

After you have downloaded the program, you can see a smile on the car's dot matrix, and the color cycle of the seven colored lights constantly changes, and the children do it together to see the effect.

2.Preparation

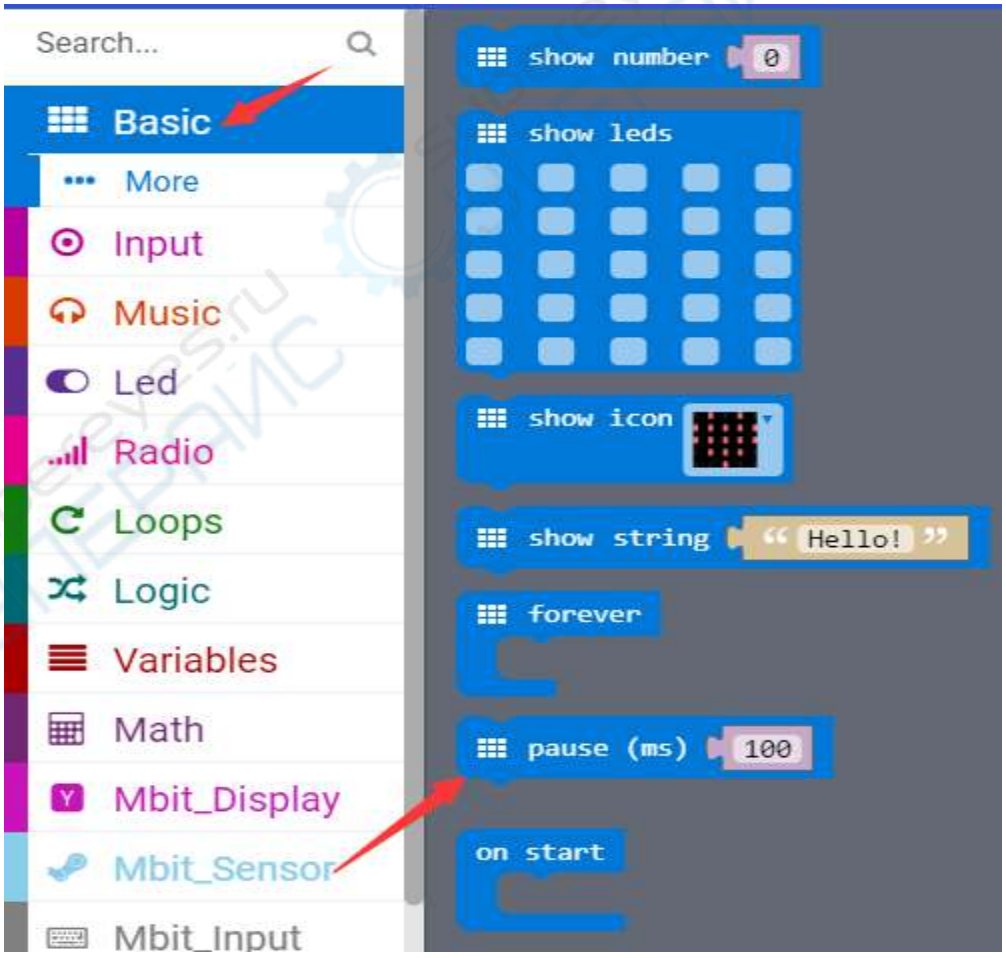
1 X USB cable
1 X micro:bit robot

Then the micro:bit is connected to the computer through USB, and the computer will pop up a U disk and click the URL in the U disk to enter the programming interface. Input this URL https://github.com/lzty634158/yahboom_mbit_en to get the package.

3.Search for blocks




Music
Led
Radio
Loops
Logic
Variables
Math
Mbit_Display
Mbit_Sensor
Mbit_Input
Mbit_Music
Mbit_Motor
Mbit_Robot
Mbit_IR
Neopixel
Advanced
Functions
Arrays
RGB_Car_Big2 value off
RGB_Car_Big value1 0 value2 0 value3 0
RGB_Car_Program
ultrasonic return distance(cm)
Music_Car dadadum
Servo_Car num S1 value 0
Avoid_Sensor value with obstacles
Line_Sensor direct left state value white
CarCtrl forward
CarCtrlSpeed forward speed 0


Search...
Basic
More
Input
Music
Led
Radio
Loops
Logic
Variables
Math
Mbit_Display
Mbit_Sensor
Mbit_Input
show number 0
show leds
show icon
show string "Hello!"
forever
pause (ms) 100
on start

4.Combine blocks

Lesson 5 “Full light control”

1.Learning goals

After you have downloaded the program, you can see a smile on the car’s dot matrix, and all the seven color flow lights are lit up. Now, the light is lit up with purple, and the children can choose to light the other colors in the program.

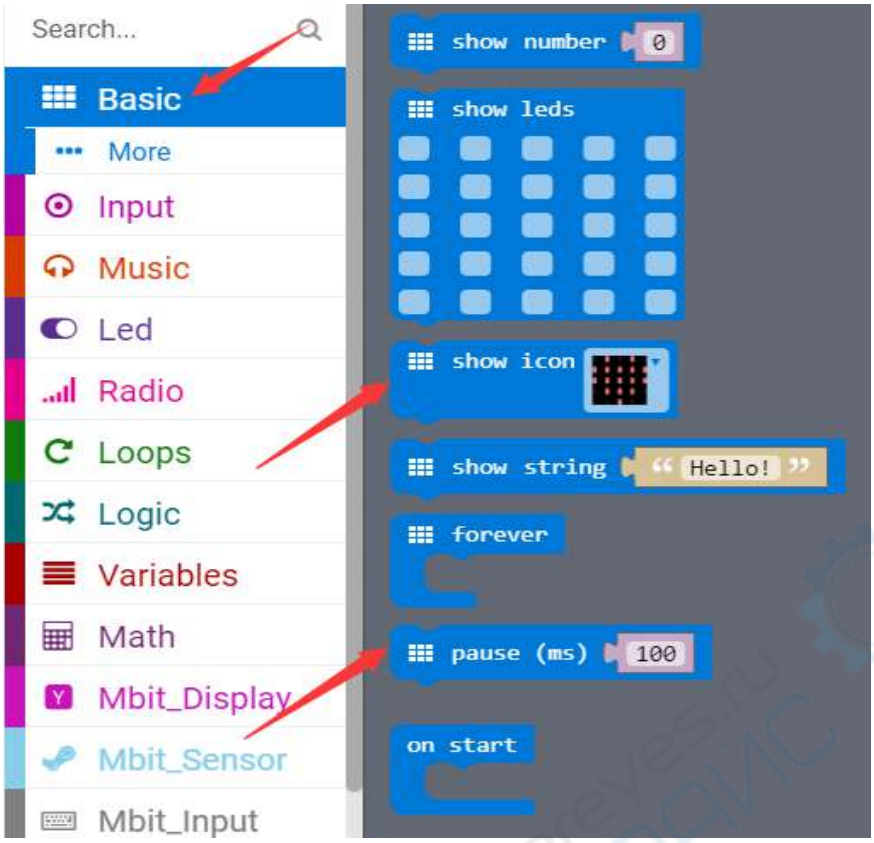
2.Preparation

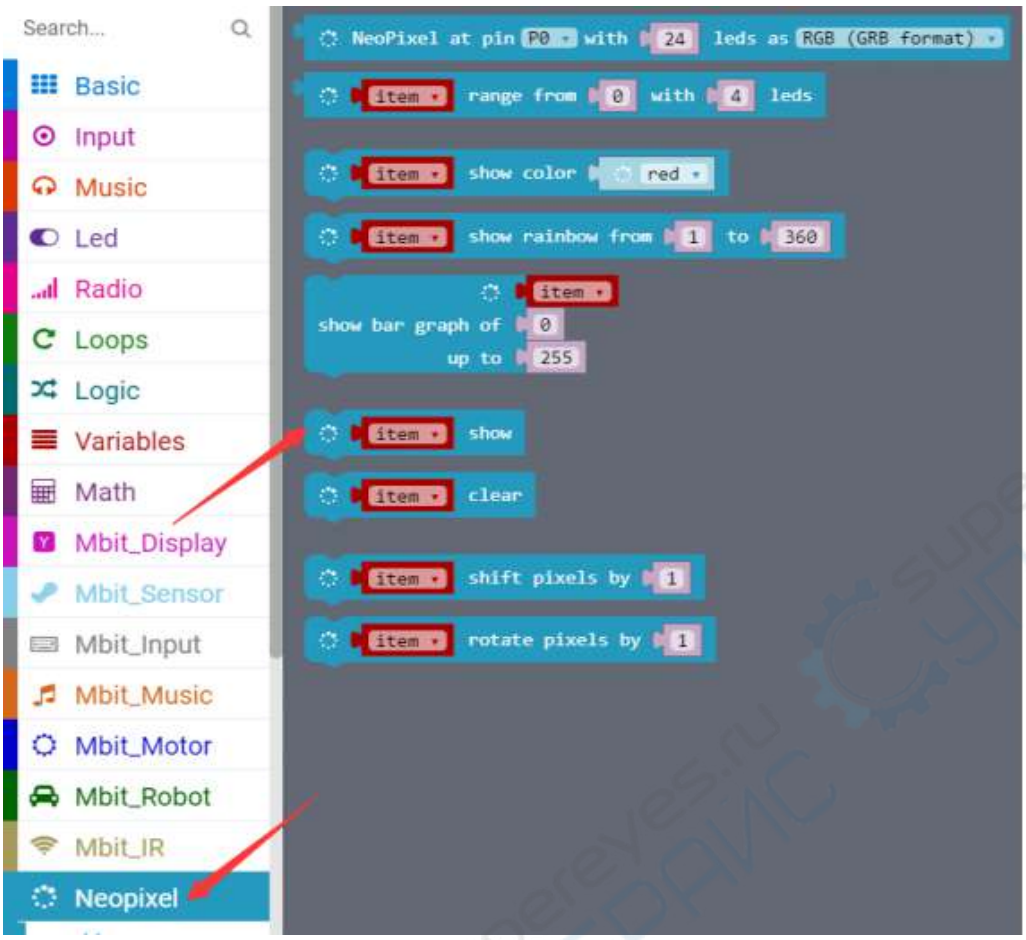
Hardware:

1 X USB cable
1 X micro:bit robot

Then the micro:bit is connected to the computer through USB, and the computer will pop up a U disk and click the URL in the U disk to enter the programming interface. Input this URL https://github.com/lzty634158/yahboom_mbit_en to get the package.

3.Search for blocks

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Logic
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Math
Mbit_Display
Mbit_Sensor
Mbit_Input
Mbit_Music
Mbit_Motor
Mbit_Robot
Mbit_IR
Neopixel
NeoPixel at pin P0 with 24 leds as RGB (GRB format)
item range from 0 with 4 leds
item show color red
item show rainbow from 1 to 360
item
show bar graph of 0
up to 255
item show
item clear
item shift pixels by 1
item rotate pixels by 1


Search...
Basic
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Music
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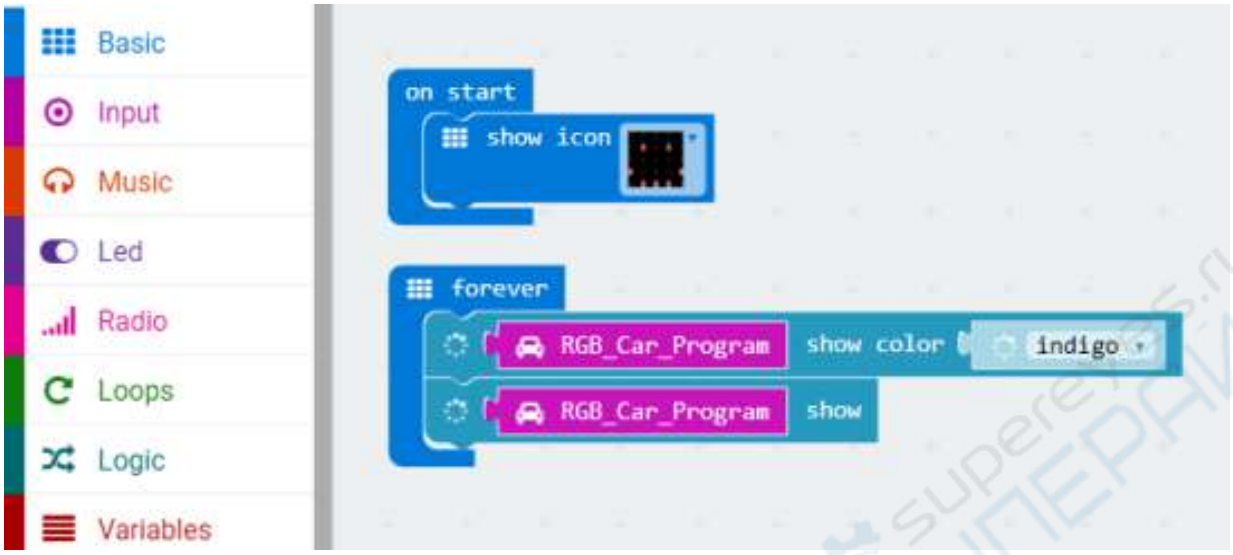
Radio
Loops
Logic
Variables
Math
Mbit_Display
Mbit_Sensor
Mbit_Input
Mbit_Music
Mbit_Motor
Mbit_Robot
Mbit_IR
Neopixel
NeoPixel at pin P0 with 24 leds as RGB (GRB format)
item range from 0 with 4 leds
item show color red
item show rainbow from 1 to 360
item
show bar graph of 0
up to 255
item show
item clear
item shift pixels by 1
item rotate pixels by 1

4.Combine blocks



The courses about water lamp need to turn off the power before downloading the new program, otherwise the water lantern will always be on.

Lesson 6 “Light alone”

1.Learning goals

After you have downloaded the program, you can see a smile on the car's dot matrix and light a seven color flow lamp alone. Now it is lit by red, and the children can choose to light the other colors in the program.

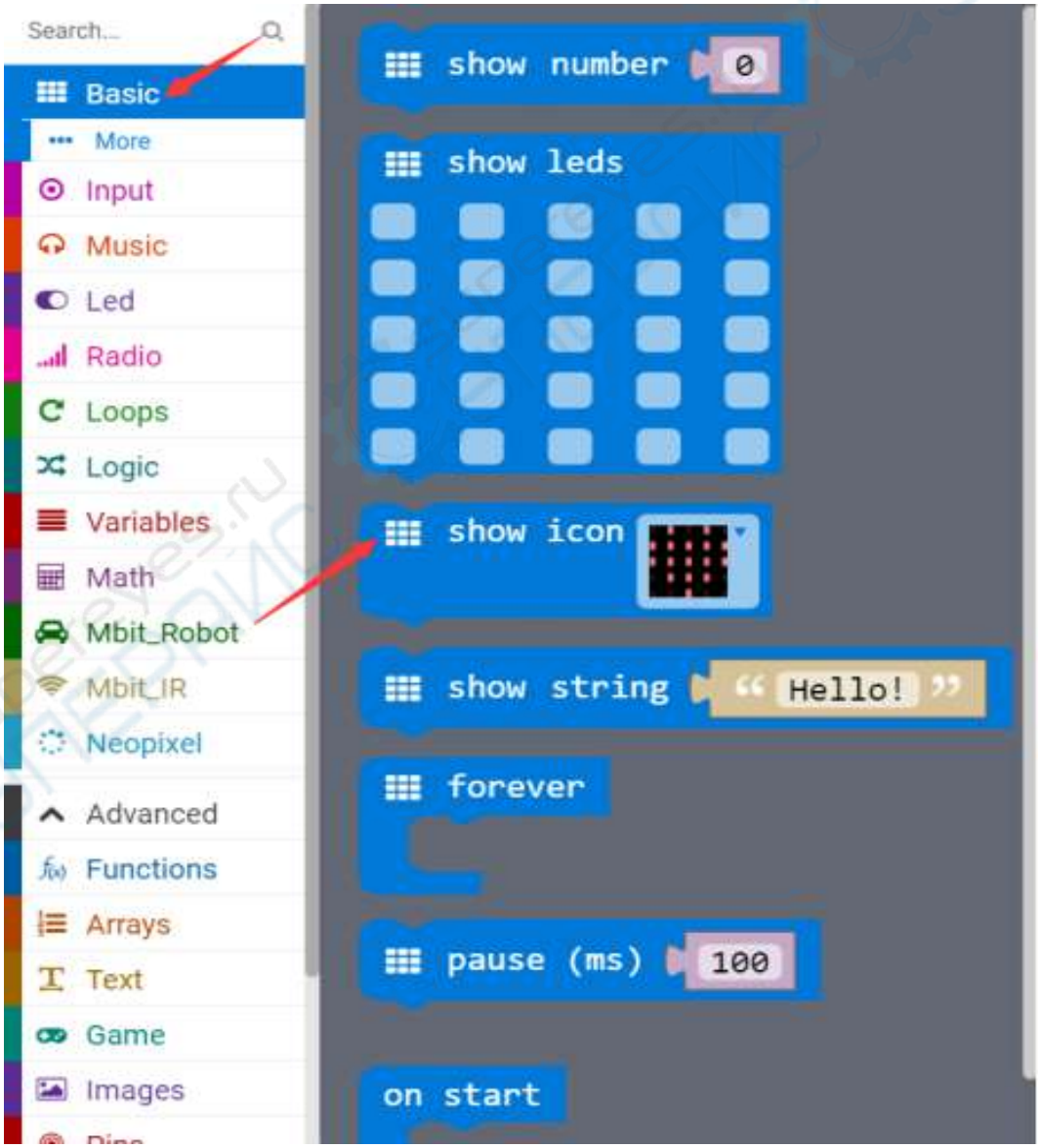
2.Preparation:

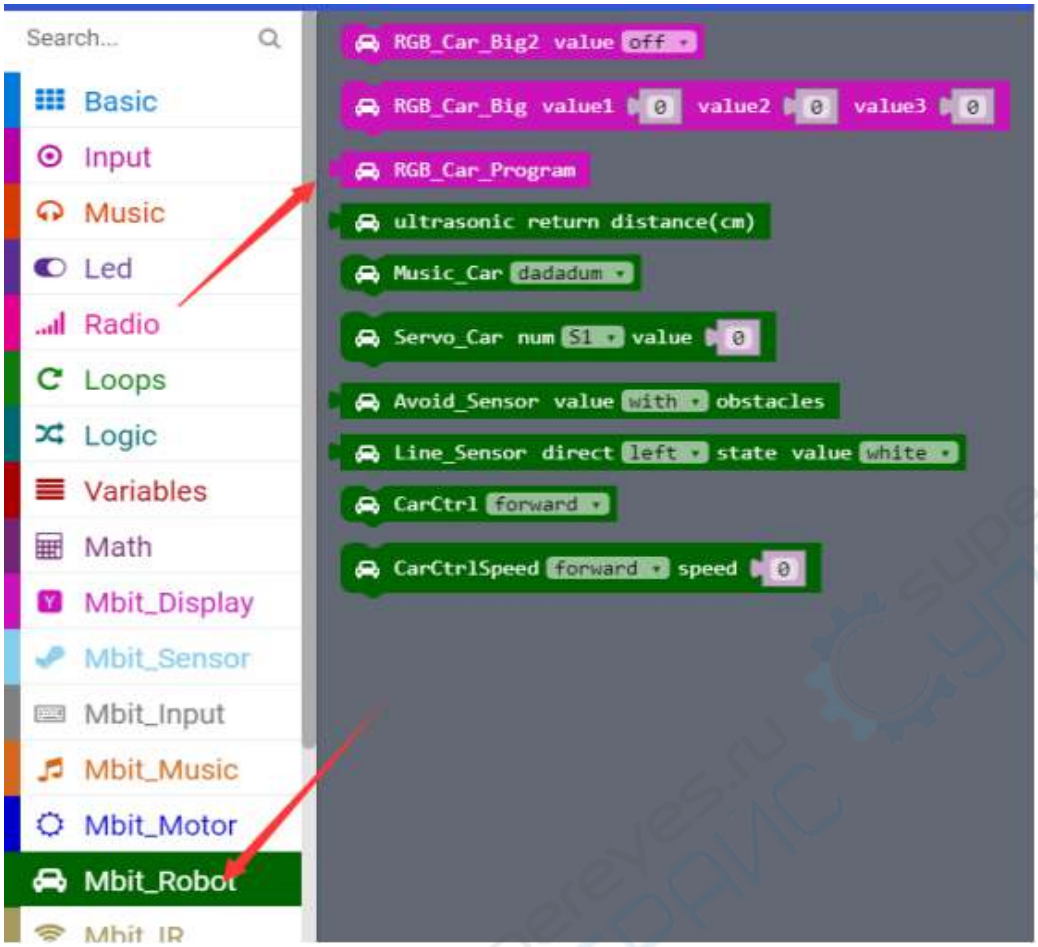
Hardware:

1 X USB cable
1 X micro:bit robot

Then the micro:bit is connected to the computer through USB, and the computer will pop up a U disk and click the URL in the U disk to enter the programming interface. Input this URL https://github.com/lzty634158/yahboom_mbit_en to get the package.

3.Search for blocks:




Search...
Basic
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Music
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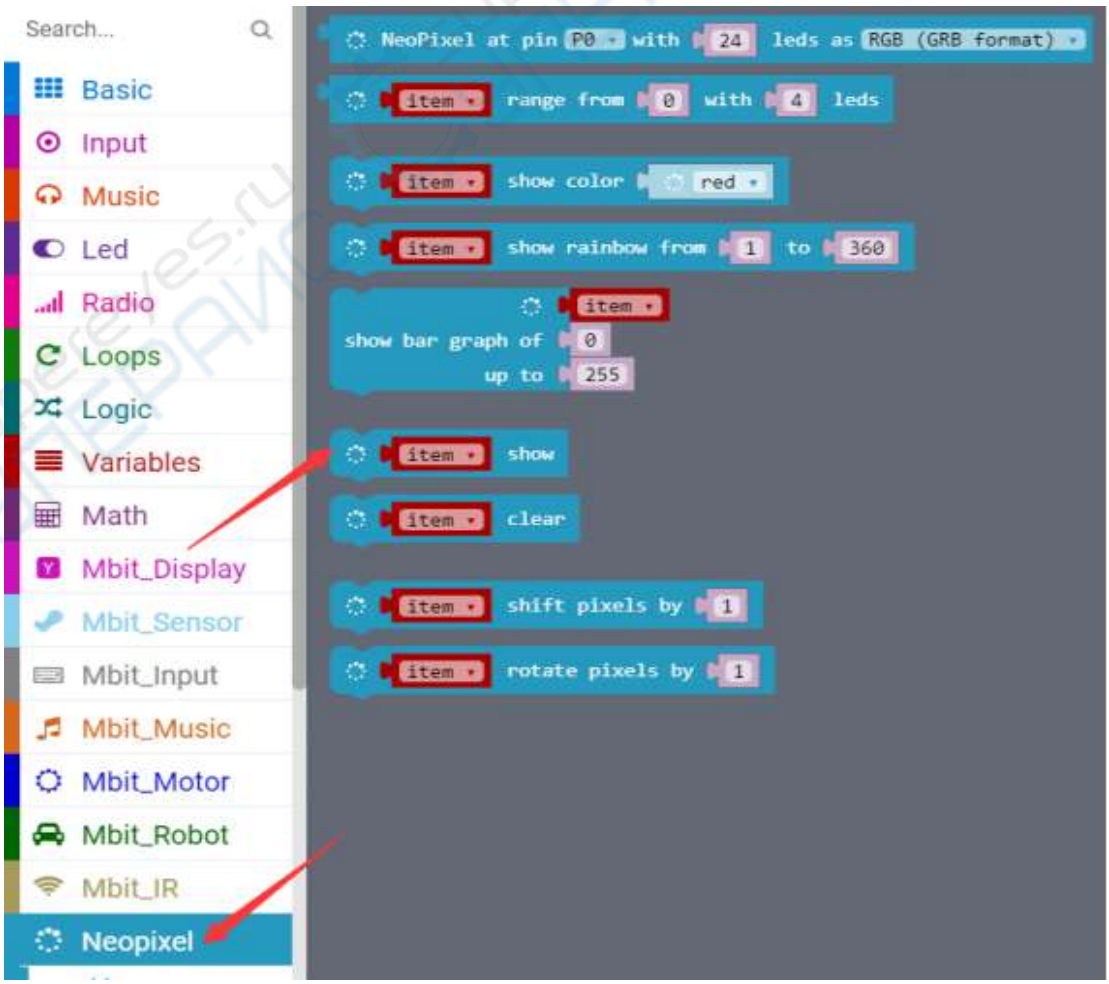
Radio
Loops
Logic
Variables
Math
Mbit_Display
Mbit_Sensor
Mbit_Input
Mbit_Music
Mbit_Motor
Mbit_Robot
RGB_Car_Big2 value off
RGB_Car_Big value1 0 value2 0 value3 0
RGB_Car_Program
ultrasonic return distance(cm)
Music_Car dadadum
Servo_Car num S1 value 0
Avoid_Sensor value with obstacles
Line_Sensor direct left state value white
CarCtrl forward
CarCtrlSpeed forward speed 0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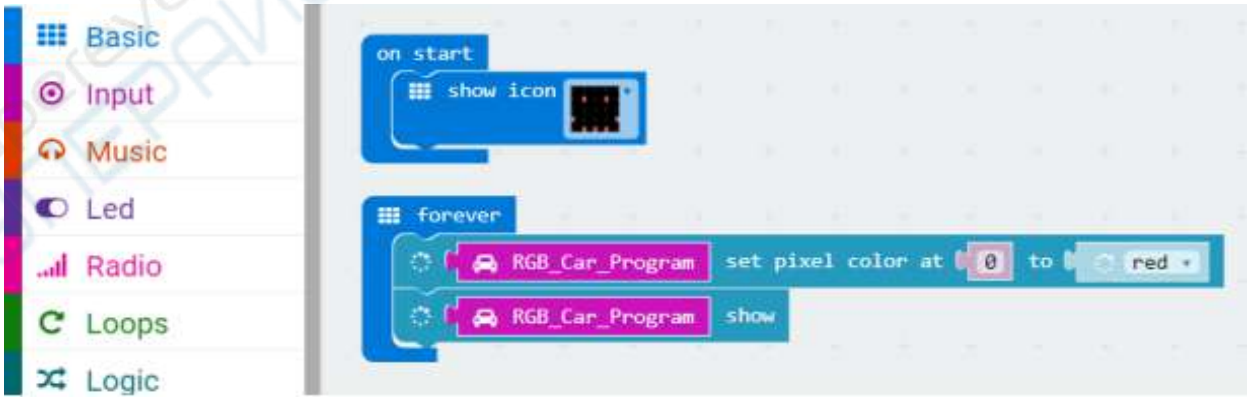
Mbit_Display
Mbit_Sensor
Mbit_Input
Mbit_Music
Mbit_Motor
Mbit_Robot
Mbit_IR
Neopixel
NeoPixel at pin P0 with 24 leds as RGB (GRB format)
item range from 0 with 4 leds
item show color red
item show rainbow from 1 to 360
item
show bar graph of 0
up to 255
item show
item clear
item shift pixels by 1
item rotate pixels by 1

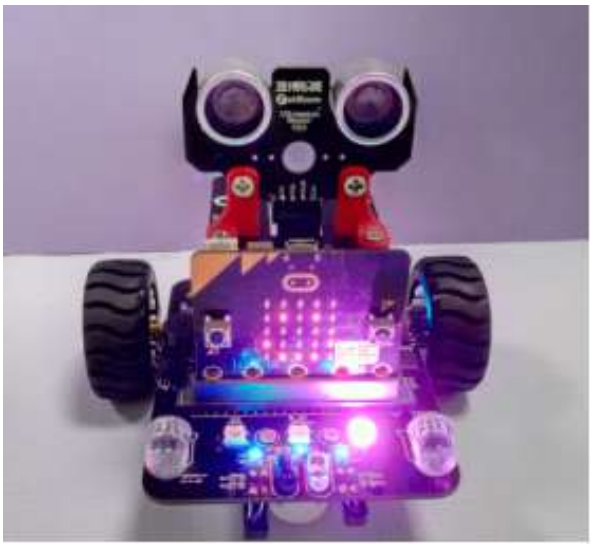
4.Combine blocks



The courses about water lamp need to turn off the power before downloading the new program, otherwise the water lantern will always be on.

Lesson 7 “Horse race lamp”

1.Learning goals



After you download the program, you can see a smile on the dot matrix of the car, and the colorful lights are lit from left to right. Is it beautiful, isn’t it? Let’s take a look at the effect.

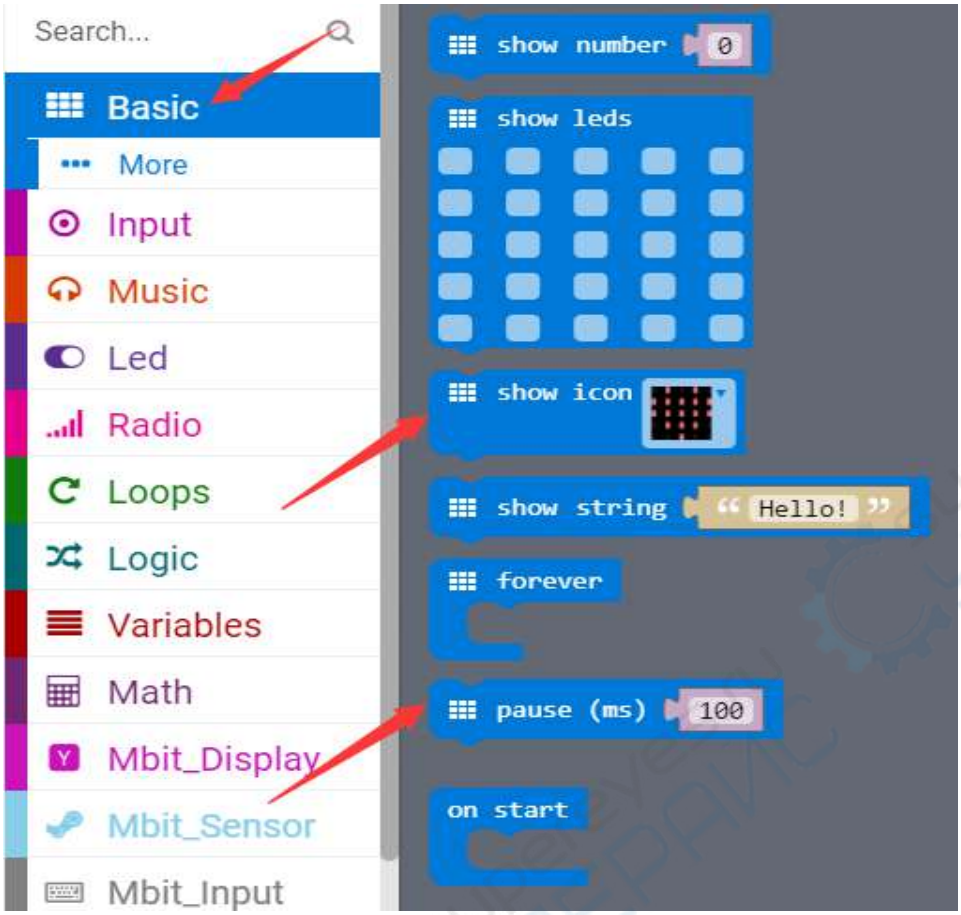
2.Preparation

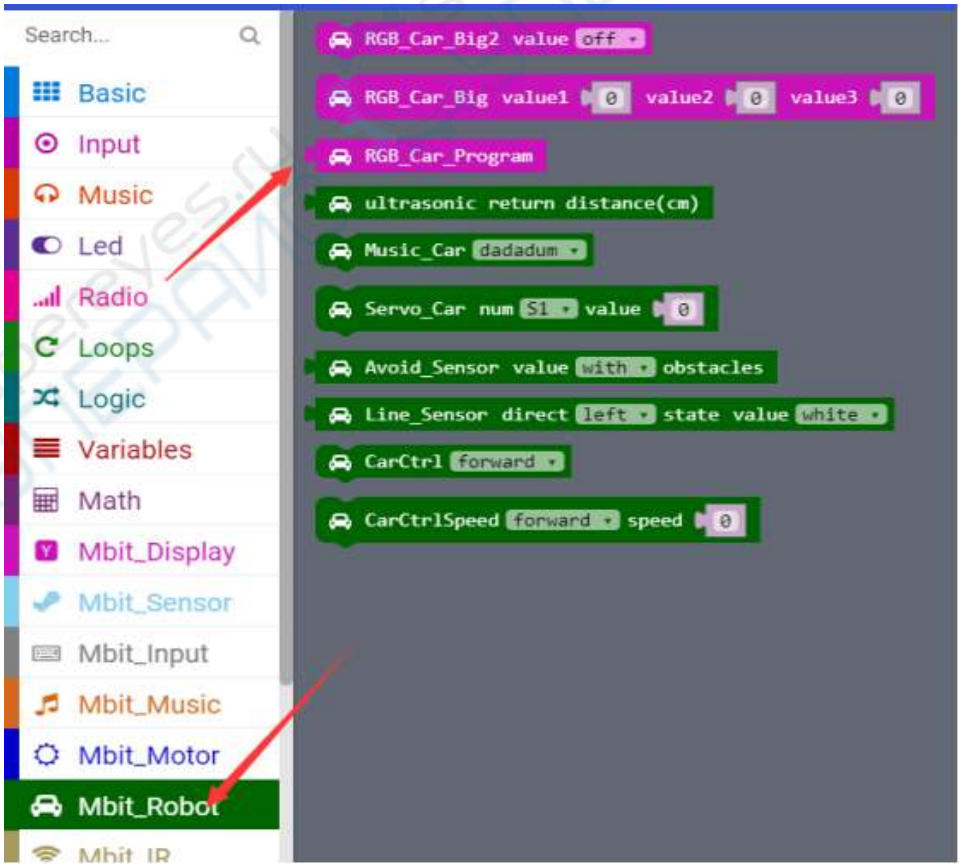
Hardware:

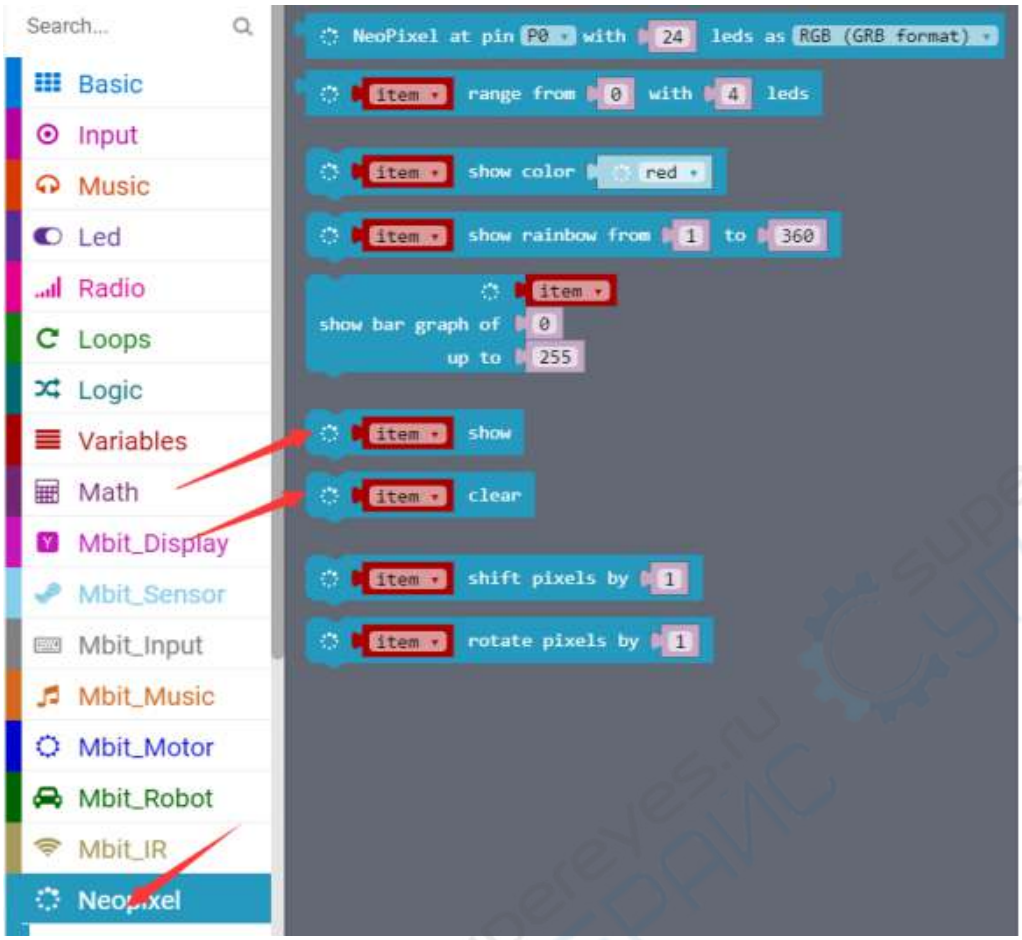
1 X USB cable
1 X micro:bit robot

Then the micro:bit is connected to the computer through USB, and the computer will pop up a U disk and click the URL in the U disk to enter the programming interface. Input this URL https://github.com/lzty634158/yahboom_mbit_en to get the package.

3.Search for blocks






Search...
Basic
Input
Music
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Radio
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Variables
Math
Mbit_Display
Mbit_Sensor
Mbit_Input
Mbit_Music
Mbit_Motor
Mbit_Robot
Mbit_IR
Neopixel
NeoPixel at pin P0 with 24 leds as RGB (GRB format)
item range from 0 with 4 leds
item show color red
item show rainbow from 1 to 360
item
show bar graph of 0
up to 255
item show
item clear
item shift pixels by 1
item rotate pixels by 1


Search...
Basic
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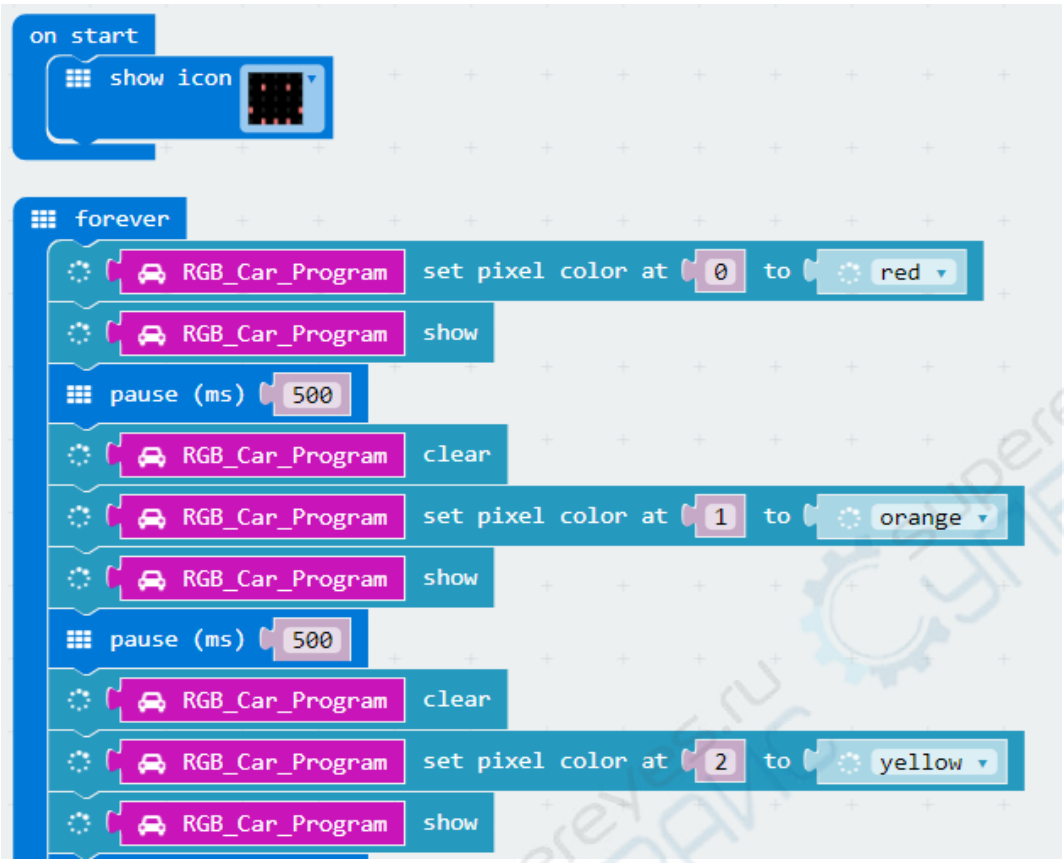
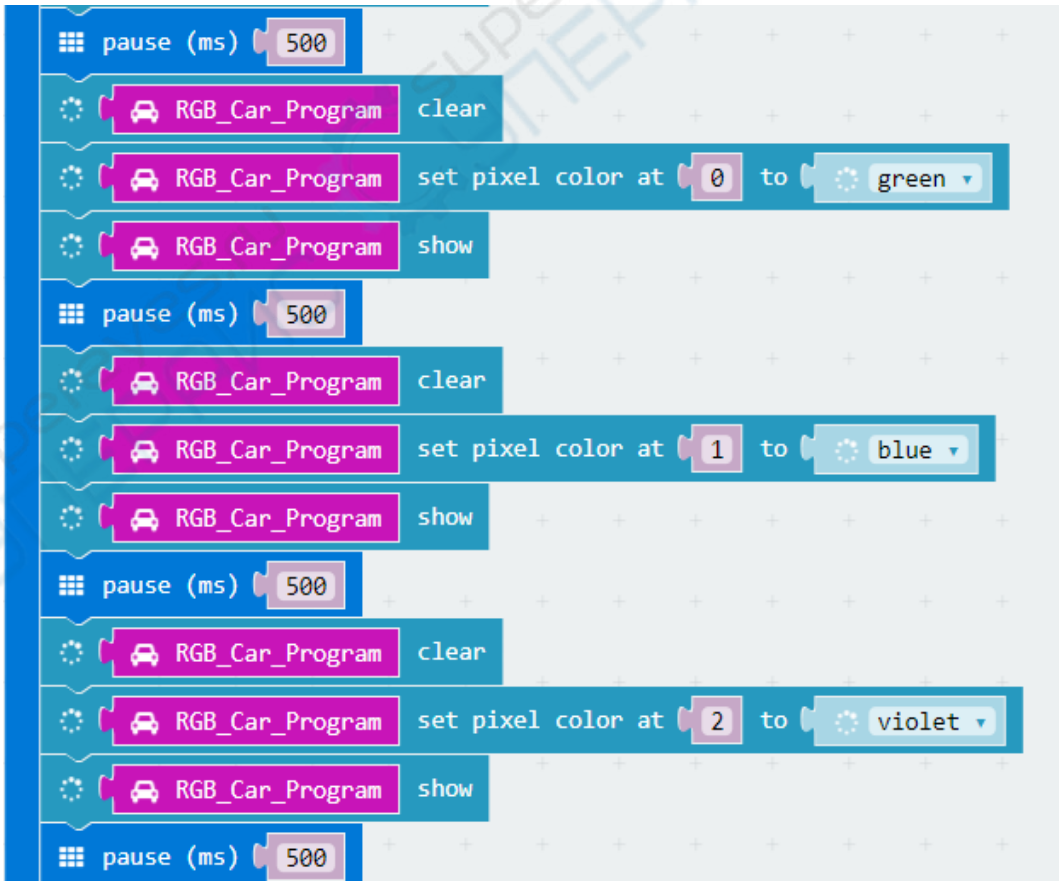
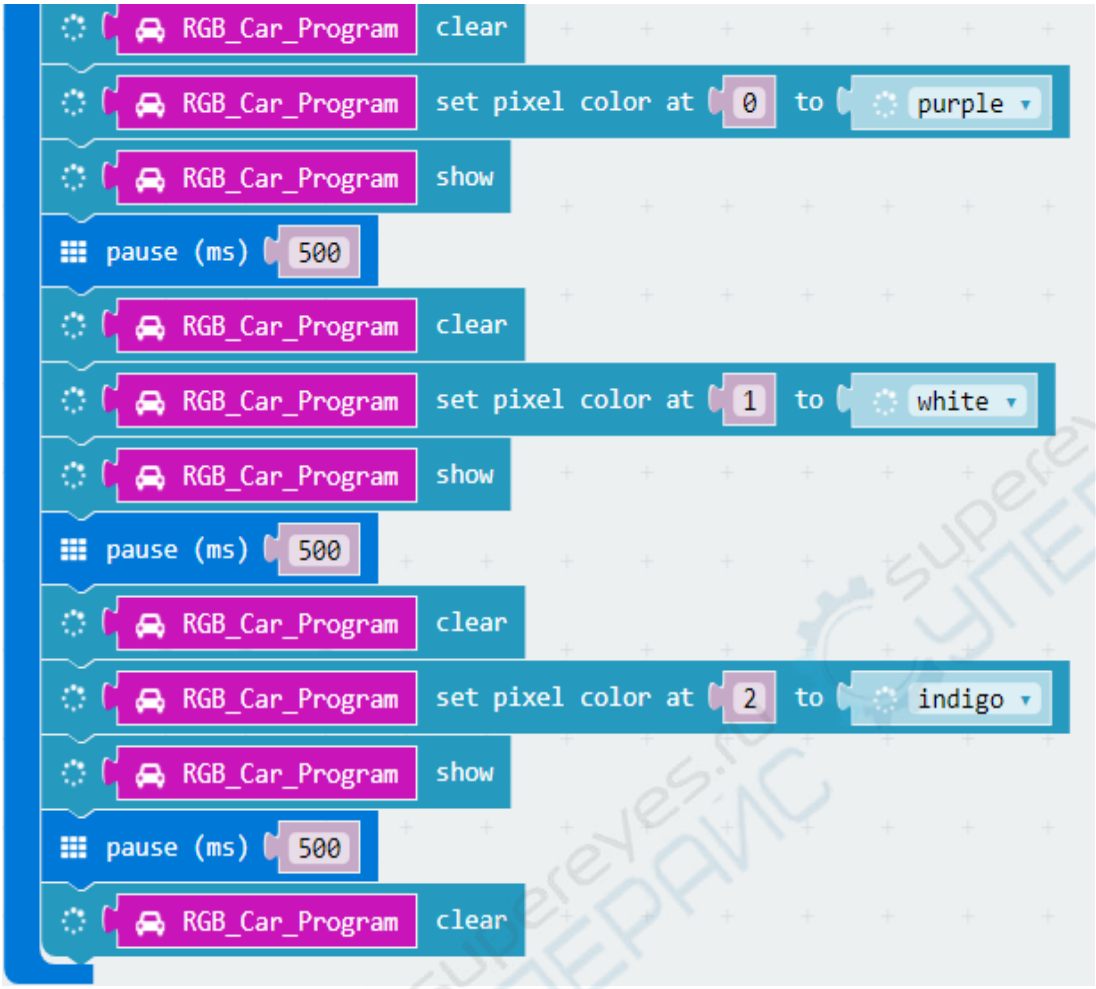
Loops
Logic
Variables
Math
Mbit_Display
Mbit_Sensor
Mbit_Input
Mbit_Music
Mbit_Motor
Mbit_Robot
Mbit_IR
Neopixel
More
item set pixel white LED at 0 to 0
item set pixel color at 0 to red
item length
item set brightness 255
item ease brightness
item power (mA)
red
item to RGB
shift item hue by 10
red 255 green 255 blue 255
hue 360 sat 100 lum 50

4.Combine blocks







The courses about water lamp need to turn off the power before downloading the new program, otherwise the water lantern will always be on.

Lesson 8 “Breathing lamp”

1.Learning goals

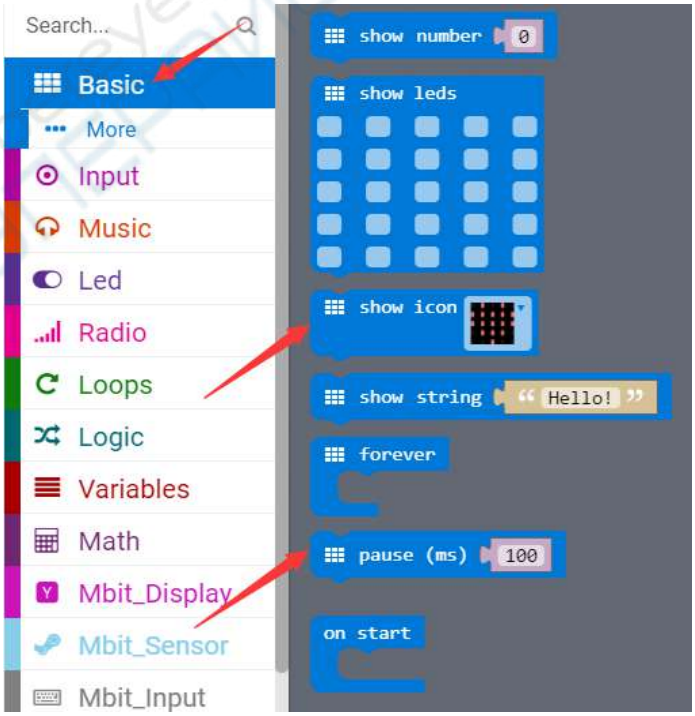
After you download the program, you can see a smile on the dot matrix of the car, and the colorful lights fade slowly and brightly, and then fade away from the light. We can also change the color of the seven color lamp, which is very beautiful in the program. Let's take a look at the effect.

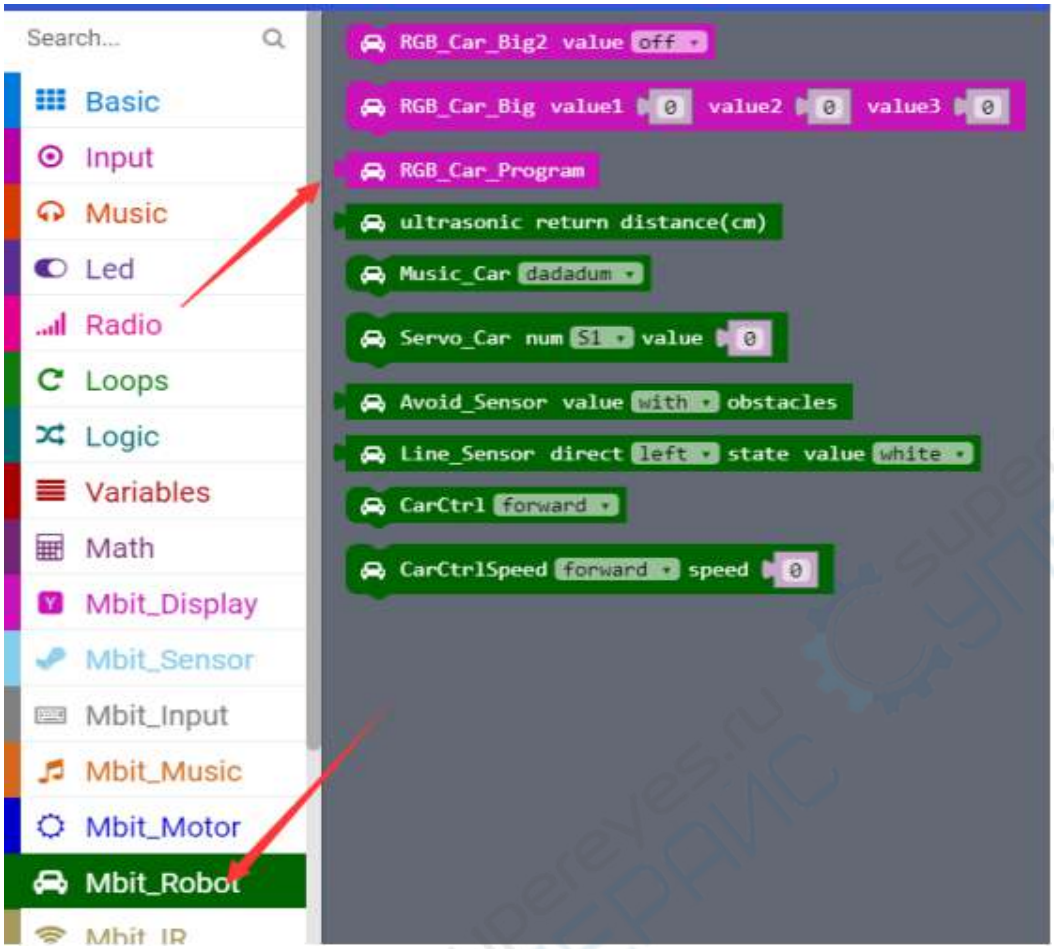
2.Preparation

1 X USB cable
1 X micro:bit robot

Then the micro:bit is connected to the computer through USB, and the computer will pop up a U disk and click the URL in the U disk to enter the programming interface. Input this URL https://github.com/lzty634158/yahboom_mbit_en to get the package.

3.Search for blocks

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Basic
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Loops
Logic
Variables
Math
Mbit_Display
Mbit_Sensor
Mbit_Input
Mbit_Music
Mbit_Motor
Mbit_Robot
RGB_Car_Big2 value off
RGB_Car_Big value1 0 value2 0 value3 0
RGB_Car_Program
ultrasonic return distance(cm)
Music_Car dadadum
Servo_Car num S1 value 0
Avoid_Sensor value with obstacles
Line_Sensor direct left state value white
CarCtrl forward
CarCtrlSpeed forward speed 0


Search...
Basic
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Loops
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Variables
Math
Mbit_Display
Mbit_Sensor
Mbit_Input
Mbit_Music
Mbit_Motor
Mbit_Robot
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item show bar graph of 0 up to 255
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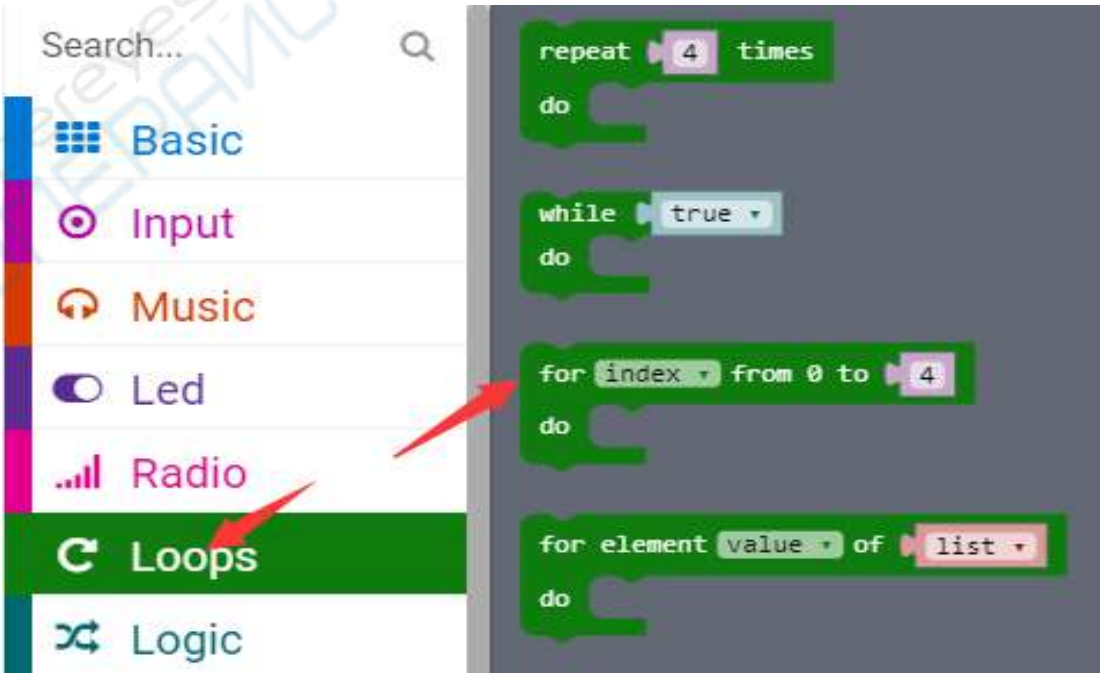
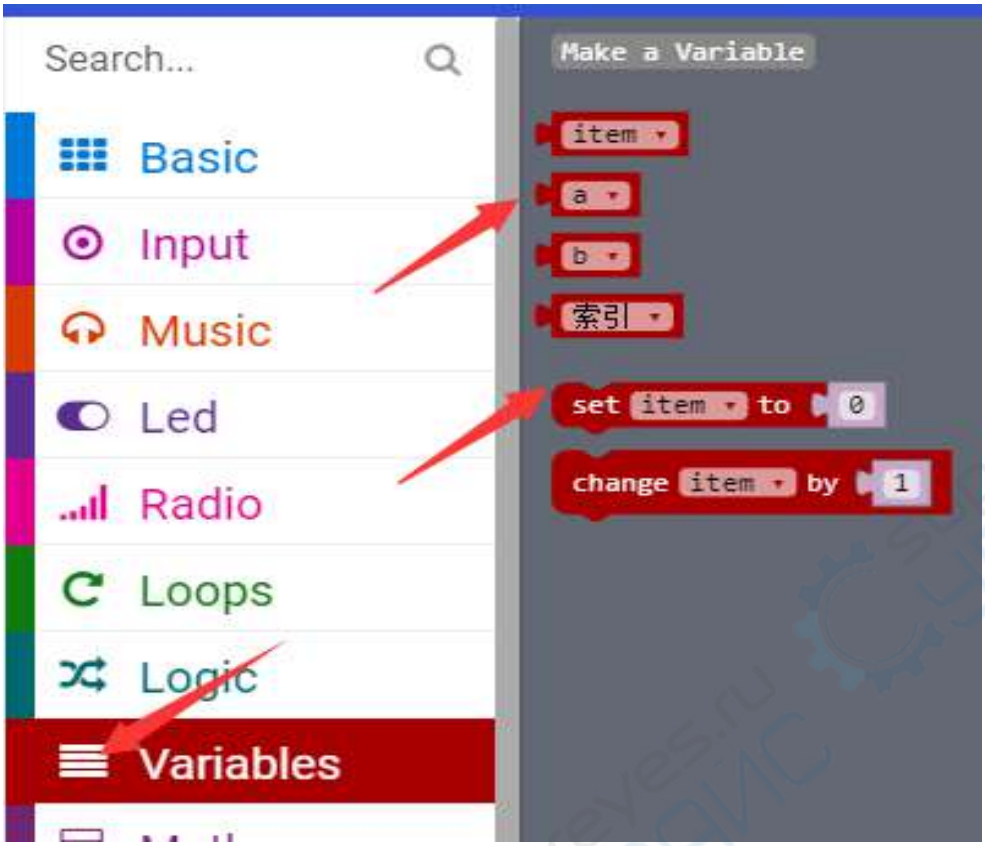
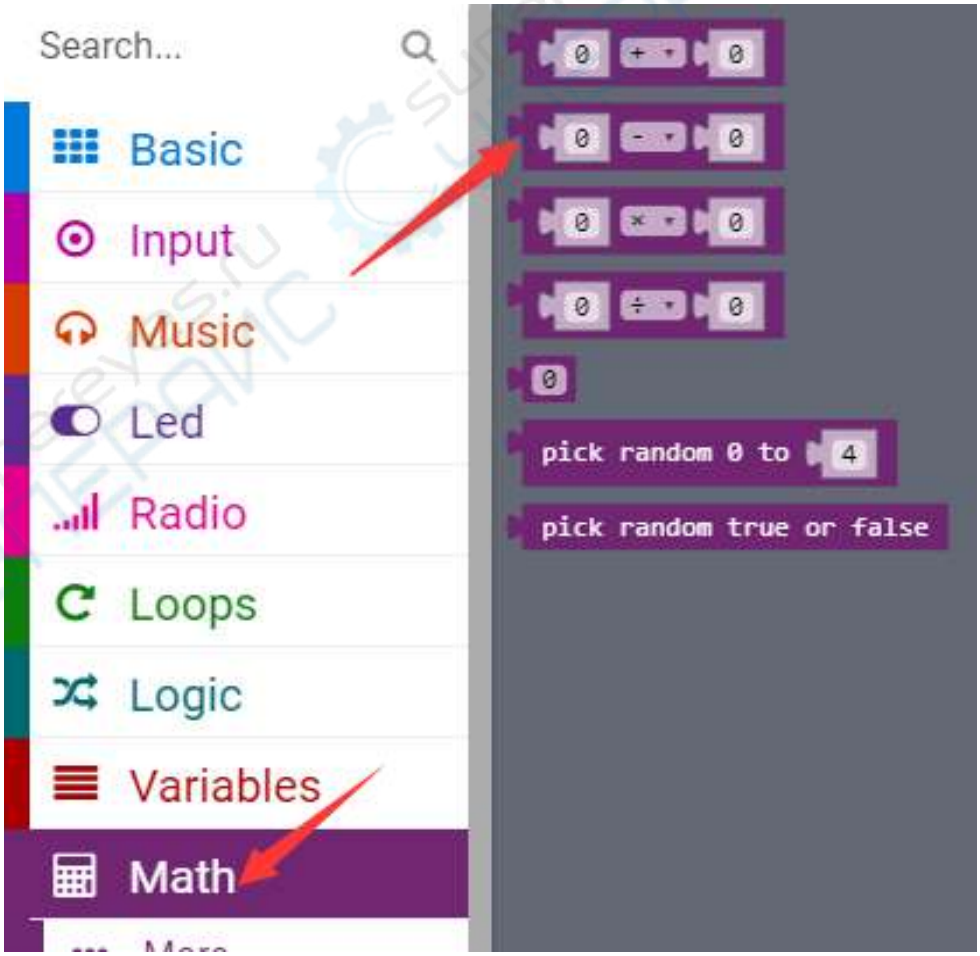
item clear
item shift pixels by 1
item rotate pixels by 1


Search...
Basic
Input
Music
Led
Radio
Loops
Logic
Variables
Math
Mbit_Display
Mbit_Sensor
Mbit_Input
Mbit_Music
Mbit_Motor
Mbit_Robot
Mbit_IR
Neopixel
More
item set pixel white LED at 0 to 0
item set pixel color at 0 to red
item length
item set brightness 255
item ease brightness
item power (mA)
red
item to RGB
shift item hue by 10
red 255 green 255 blue 255
hue 360 sat 100 lum 50


Search...
Basic
Input
Music
Led
Radio
Loops
Logic
repeat 4 times
do
while true
do
for index from 0 to 4
do
for element value of list
do

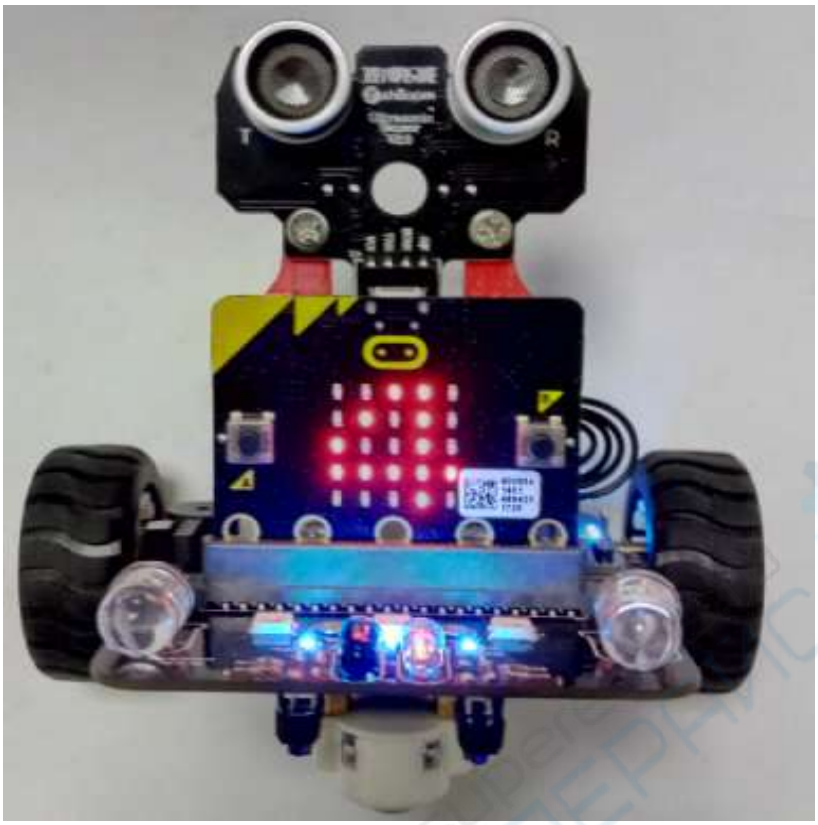

Search...
Basic
Input
Music
Led
Radio
Loops
Logic
Variables
Make a Variable
item
a
b
索引
set item to 0
change item by 1


Search...
Basic
Input
Music
Led
Radio
Loops
Logic
Variables
Math
0 + 0
0 - 0
0 × 0
0 ÷ 0
0
pick random 0 to 4
pick random true or false

4.Combine blocks

Lesson 9 “Ultrasonic sensor”

1.Learning goals



When you download the program, you can see the number on the dot matrix of the car, and if the hand is shielded in front of the ultrasonic, you can see that the number is turned into a digit. Ultrasound can measure the distance of 2-400 (CM). Let's have a look at the effect together.

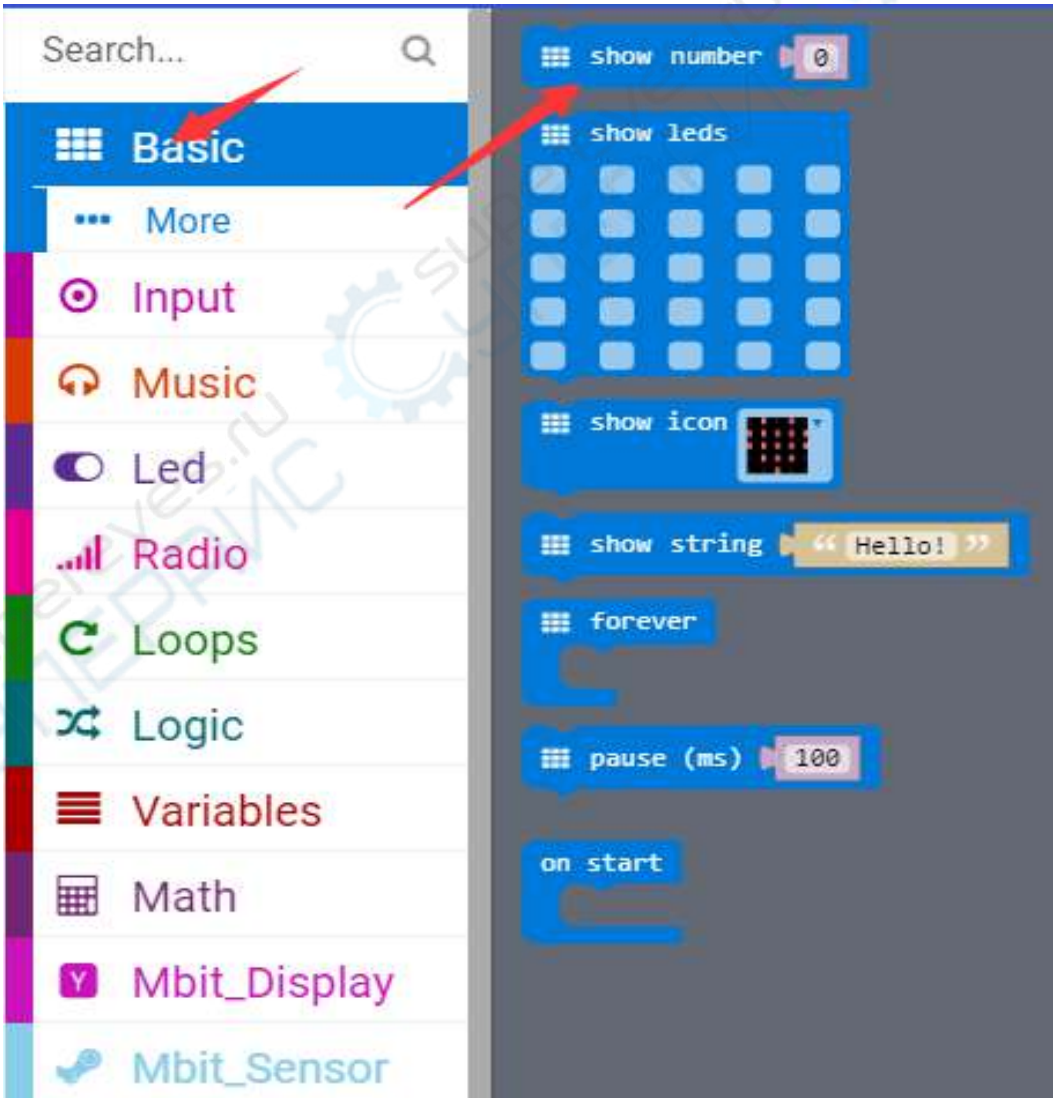
2.Preparation

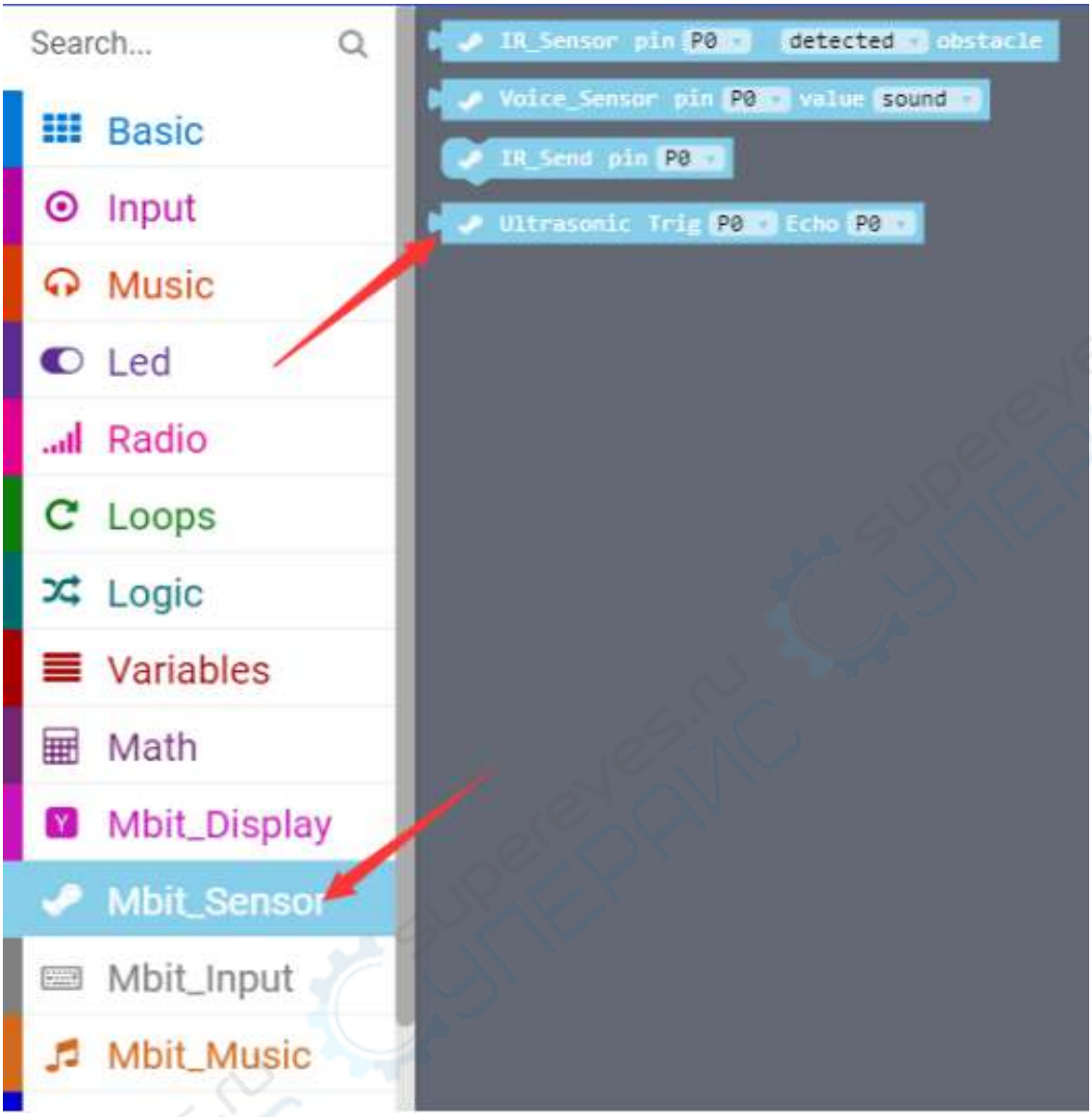
Hardware:

1 X USB cable
1 X micro:bit robot

Then the micro:bit is connected to the computer through USB, and the computer will pop up a U disk and click the URL in the U disk to enter the programming interface. Input this URL https://github.com/lzty634158/yahboom_mbit_en to get the package.

3.Search for blocks



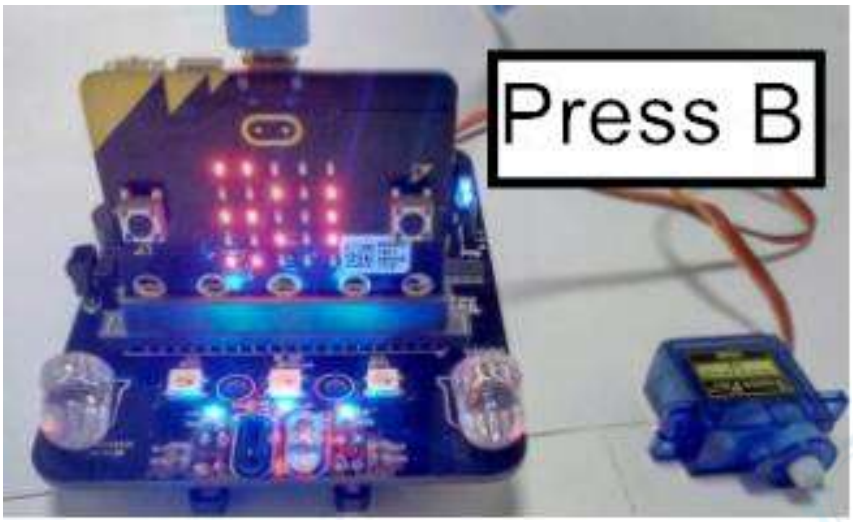


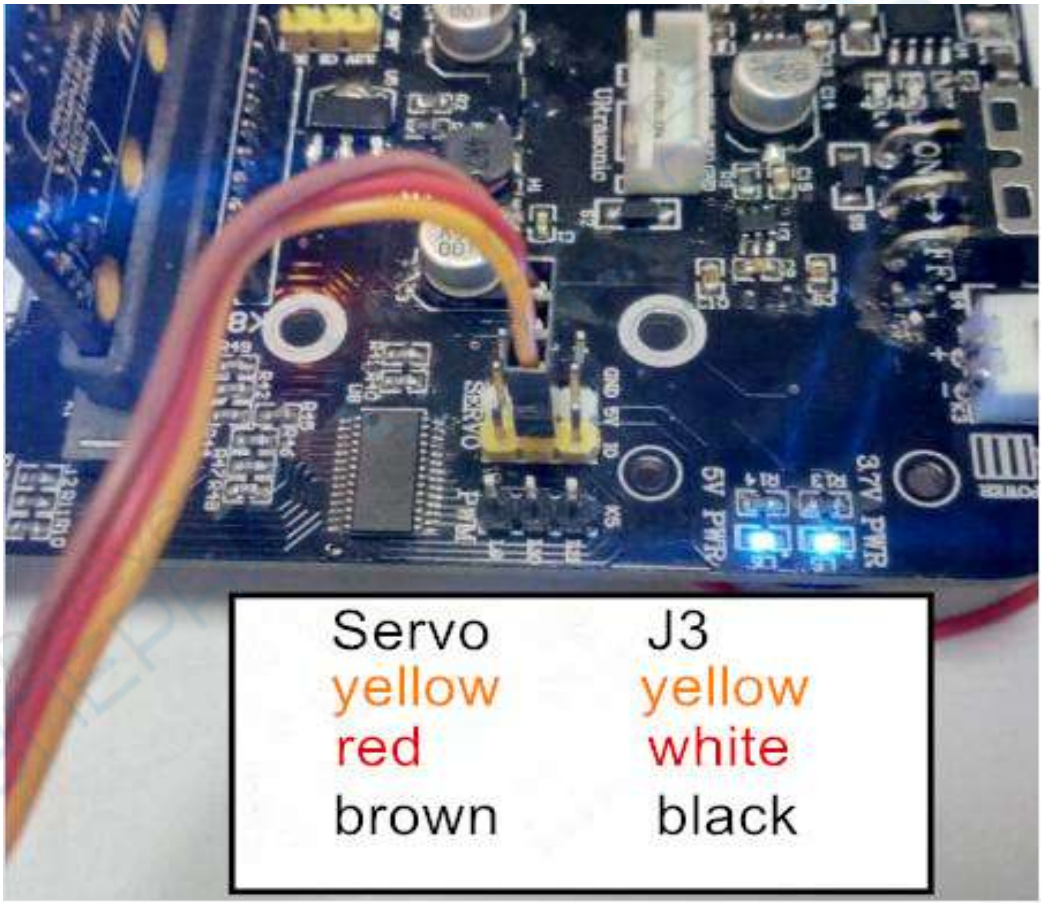
4.Combine blocks

In this lesson, children should check their own ultrasonic connection. VCC corresponds to VCC and GND corresponds to GND. In addition, the demand for voltage is higher than that of ultrasonic. It is recommended to fill up the electric capacity and do the experiment again.

Lesson 10 “Servo control”

1.Learning goals





After you downloaded a good program download the program, press A key, you can see the servo to 0 degrees, while the dot matrix display 0, and then press the B key, you can see the servo to 180 degrees, while the lattice display value 180, the children also do it yourself, try to drive a steering gear bar.

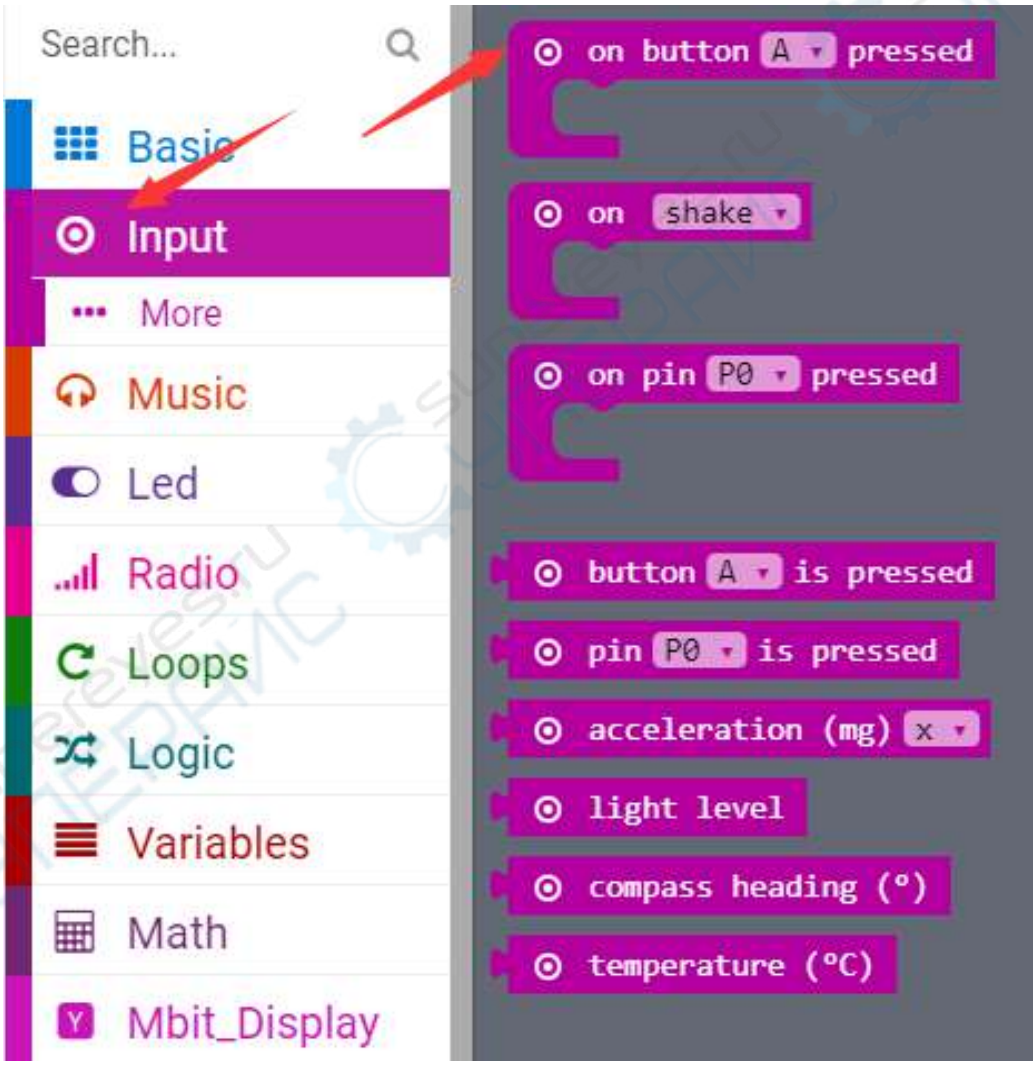
2.Preparation:

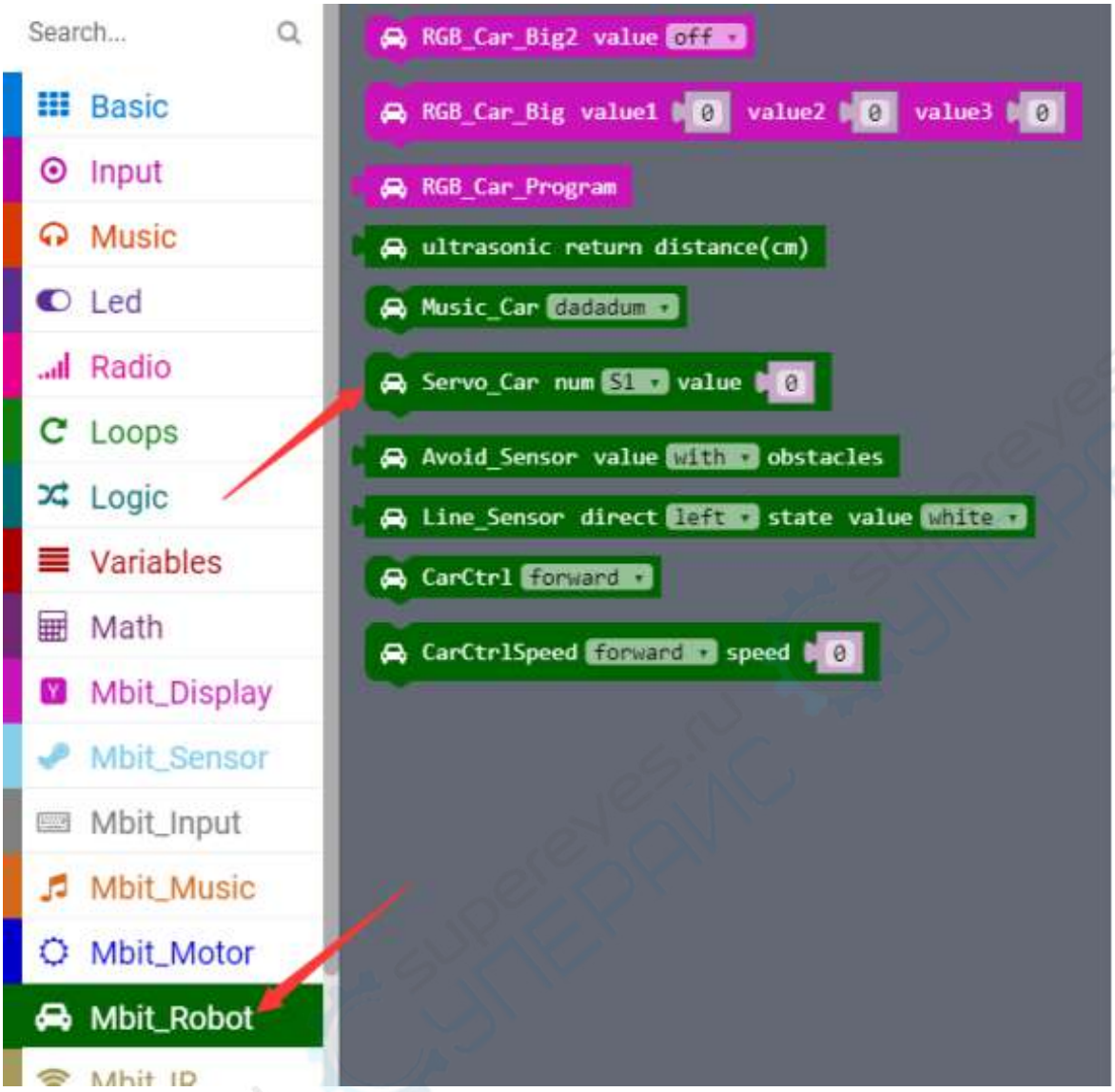
Hardware:

1 X BBC micro:bit
1 X micro:bit expansion board
1 X USB cable
1 X Servo

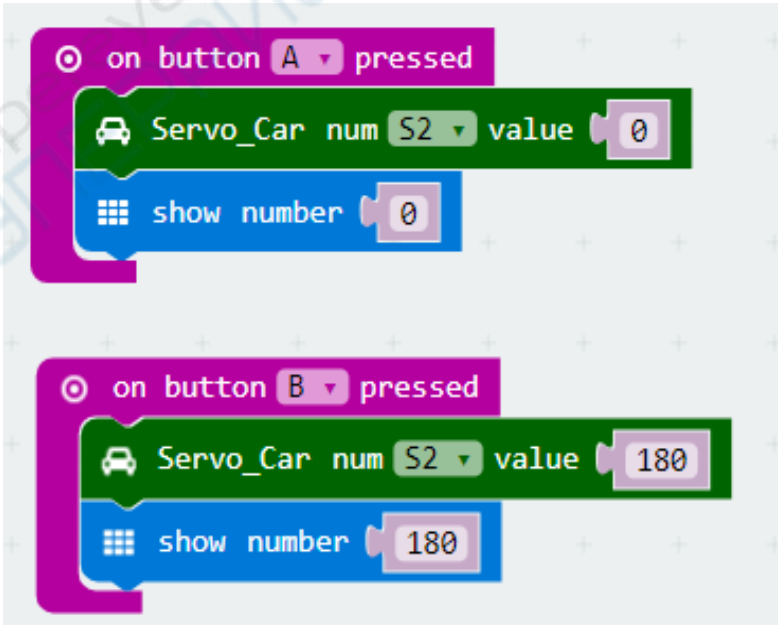
Then the micro:bit is connected to the computer through USB, and the computer will pop up a U disk and click the URL in the U disk to enter the programming interface. Input this URL https://github.com/lzty634158/yahboom_mbit_en to get the package.

3.Search for blocks





4.Combine blocks



Lesson 10 “Servo control”

1.Learning goals

After you download the program, you can control the car by remote control.
Press the button in the box 1 to turn off the light.
Press the button in box 2, and you can light different colors of lights.
Press the buttons inside the box 3 can play different tones, and play a song for the score.
Press the buttons in the box 4 to display different patterns on the dot matrix.
Isn’t it fun? Try it.

Tips: Do you wonder if the infrared indicator is not lit when the infrared remote control is used. Is this remote control a bad one? No, the infrared remote controller can’t see the eye of the infrared light. You can open the camera of the mobile phone and look at the light of the remote control by the camera. When you press the button, it shows a slight flicker. Of course. Some phones have the function of filtering out the infrared light, which is also invisible.

2.Preparation:

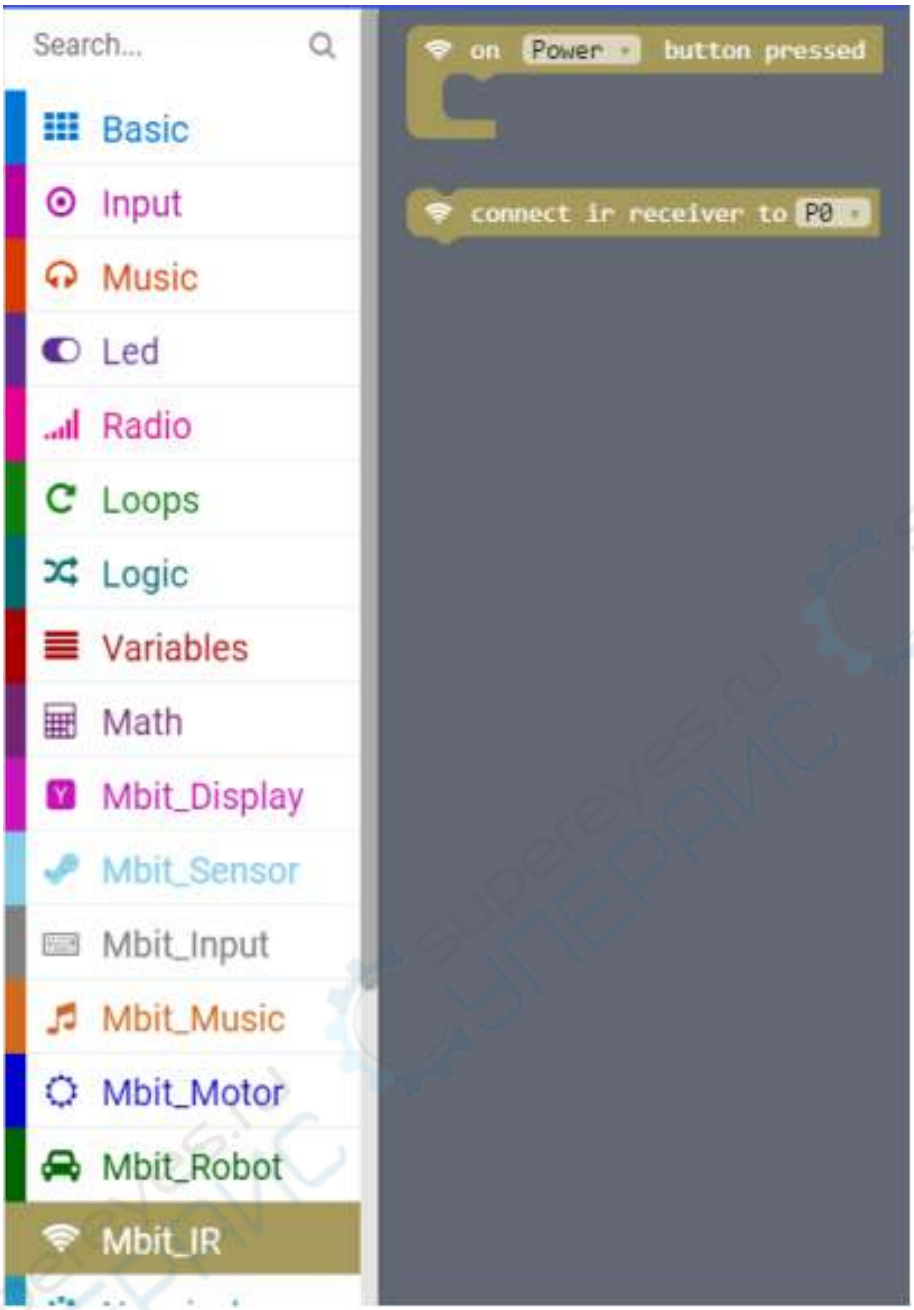
Hardware:

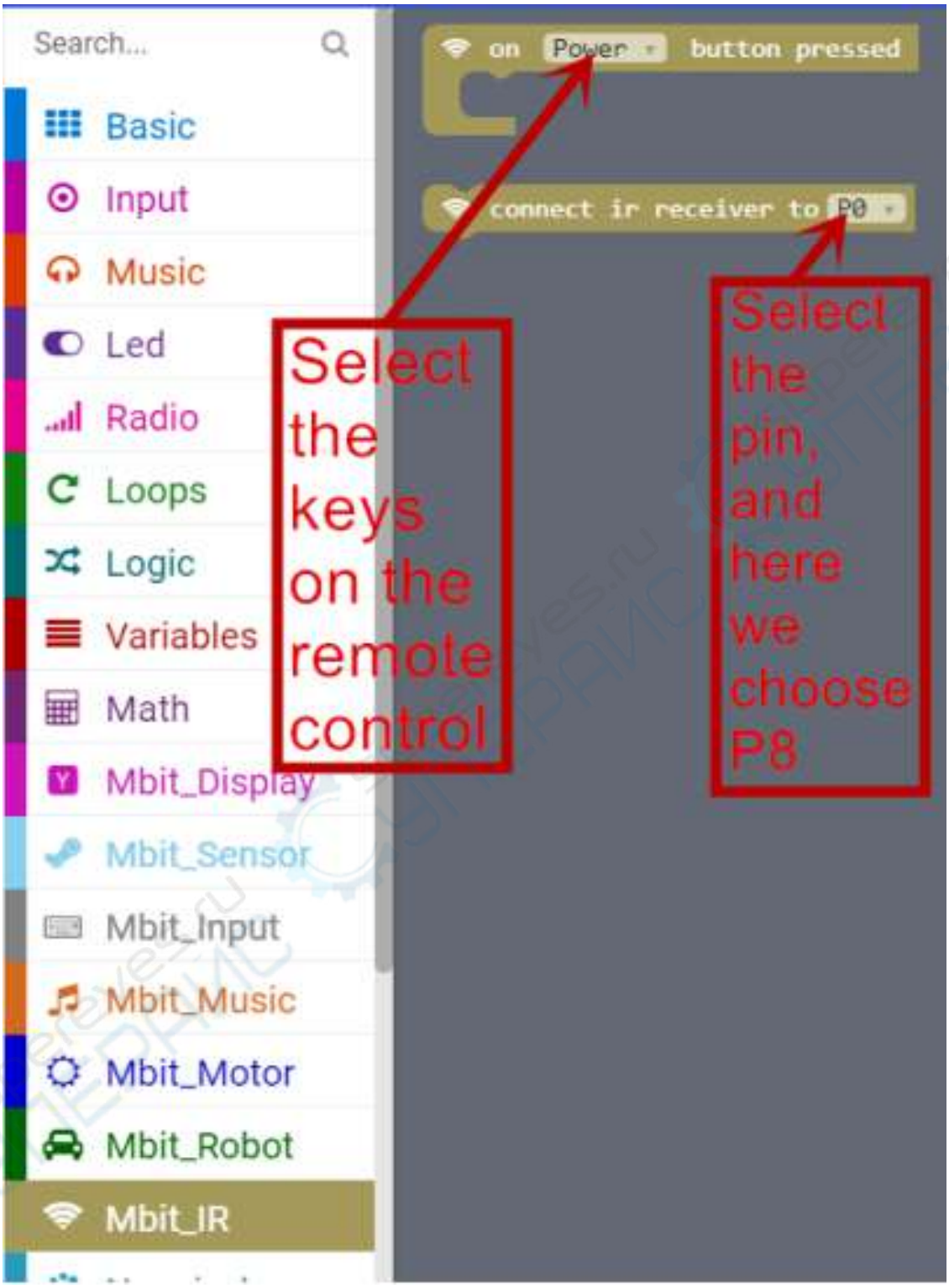
- 1 X BBC micro:bit
- 1 X micro:bit expansion board
- 1 X USB cable

- 1 X Infrared controller

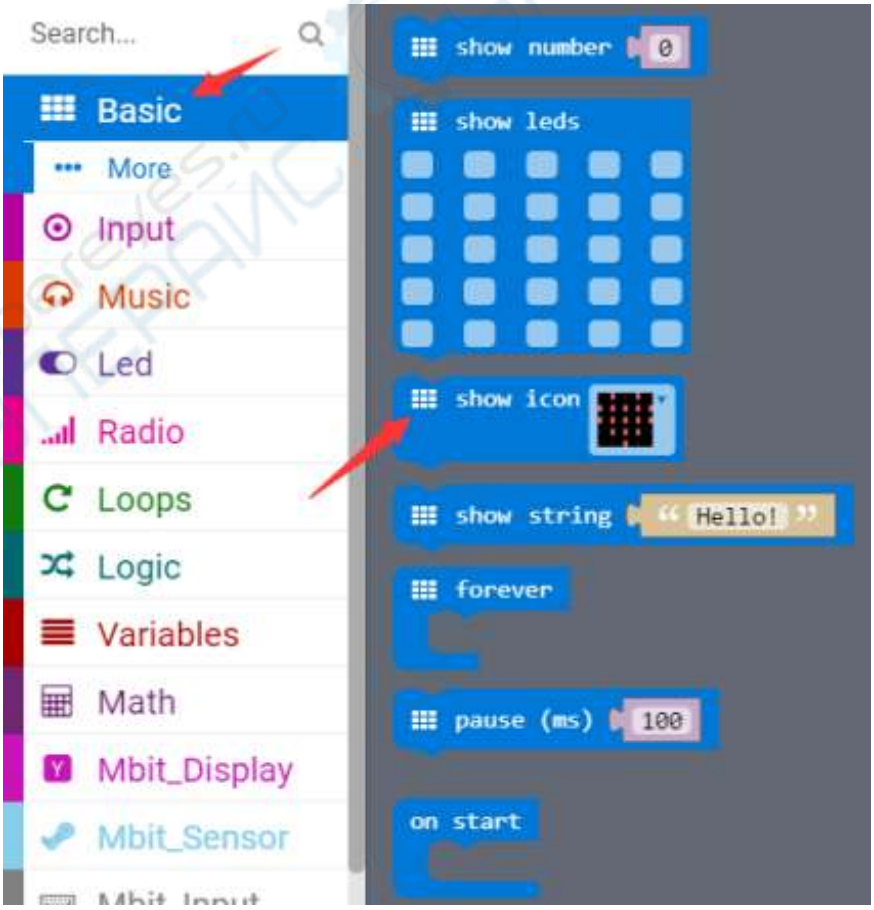
Then the micro:bit is connected to the computer through USB, and the computer will pop up a U disk and click the URL in the U disk to enter the programming interface. Input this URL https://github.com/lzty634158/yahboom_mbit_en to get the package.

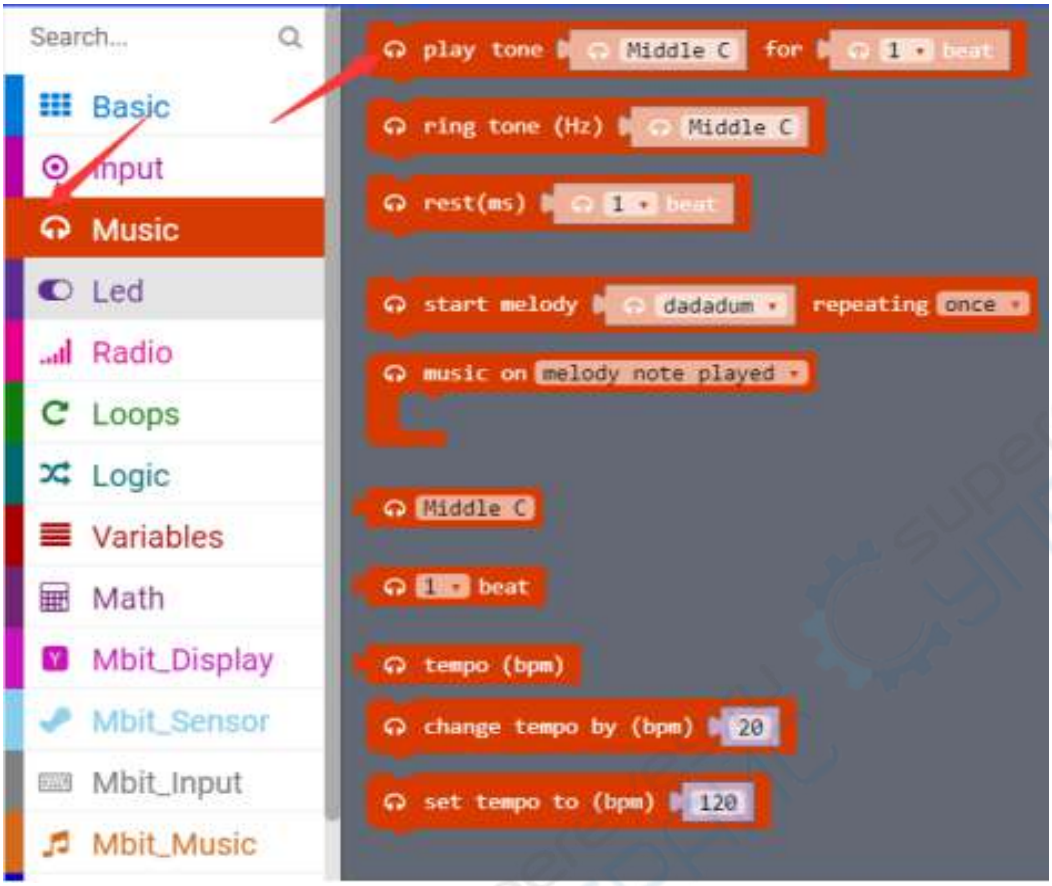
3.Search for blocks



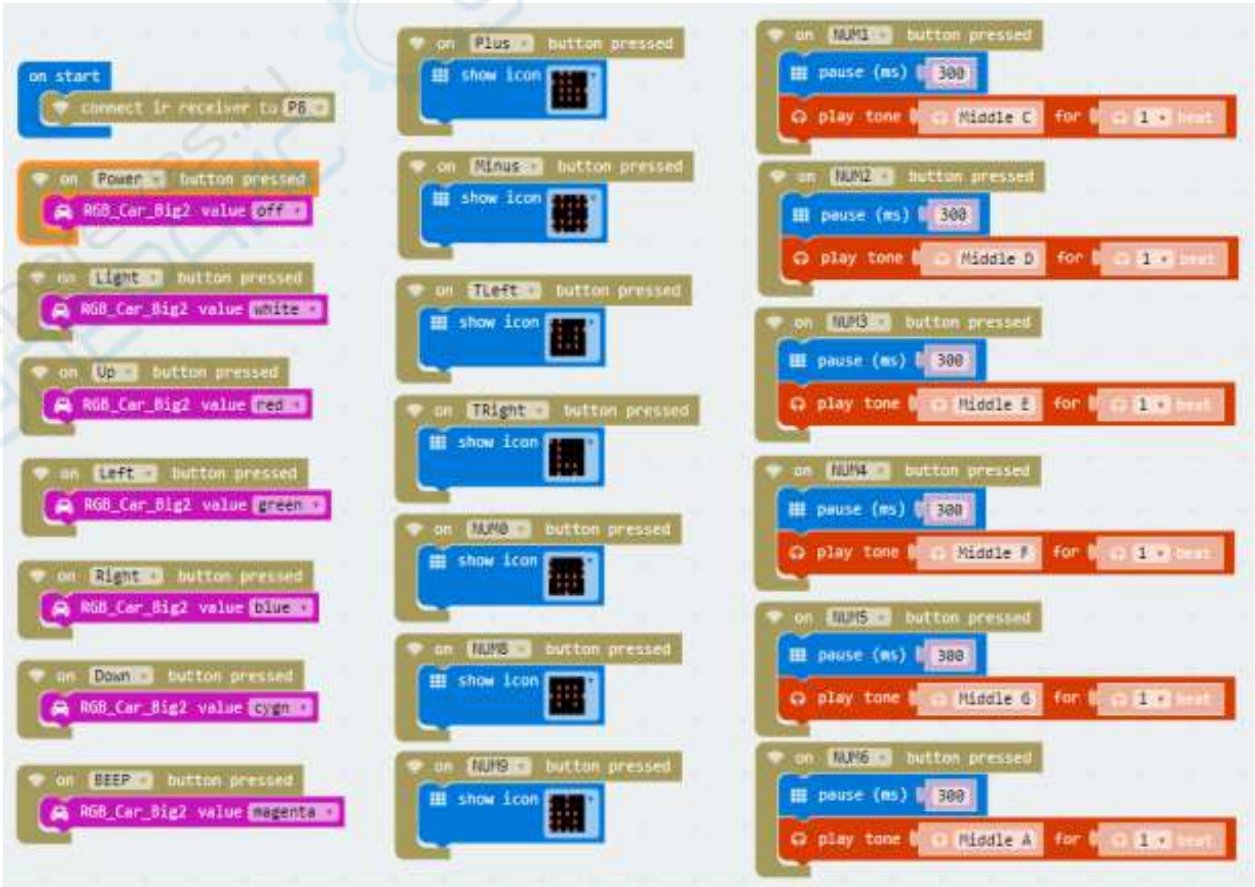

Search...
Basic
Input
Music
Led
Radio
Loops
Logic
Variables
Math
Mbit_Display
Mbit_Sensor
Mbit_Input
Mbit_Music
Mbit_Motor
Mbit_Robot
Mbit_IR
on Power button pressed
connect ir receiver to P0
Select the keys on the remote control
Select the pin, and here we choose P8


Search...
Basic
Input
Music
Led
Radio
Loops
Logic
Variables
Math
Mbit_Display
Mbit_Sensor
Mbit_Input
Mbit_Music
Mbit_Motor
Mbit_Robot
Mbit_IR
RGB_Car_Big2 value off
RGB_Car_Big value1 0 value2 0 value3 0
RGB_Car_Program
ultrasonic return distance(cm)
Music_Car dadadum
Servo_Car num S1 value 0
Avoid_Sensor value with obstacles
Line_Sensor direct left state value white
CarCtrl forward
CarCtrlSpeed forward speed 0


Search...
Basic
More
Input
Music
Led
Radio
Loops
Logic
Variables
Math
Mbit_Display
Mbit_Sensor
show number 0
show leds
show icon
show string "Hello!"
forever
pause (ms) 100
on start



4.Combine blocks



Attentions:This experiment must be carried out indoors to reduce interference from sunlight to infrared receiver.