

2019

Yahboom Arduino 4WD Robot

Graphical Programming Tutorials

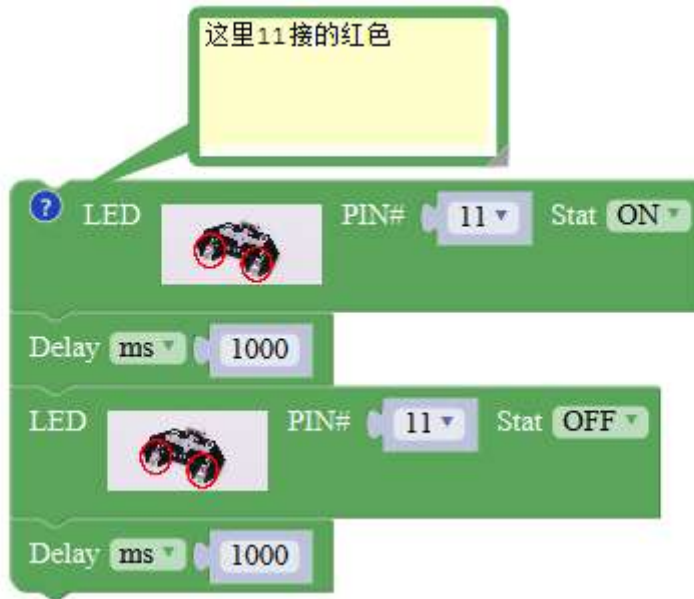


Graphical programming

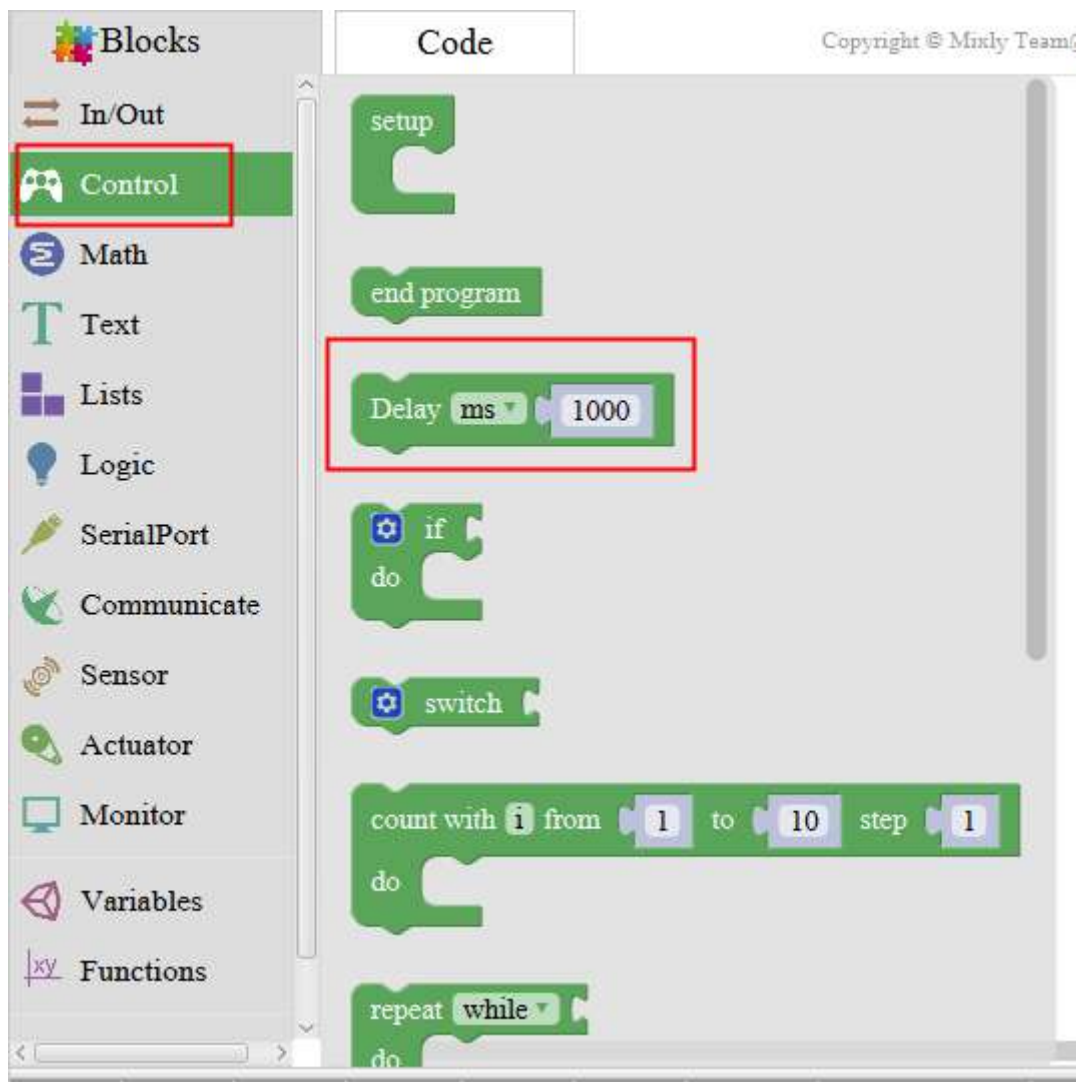
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1- LED Twinkle

Follow the steps to splice the building blocks :

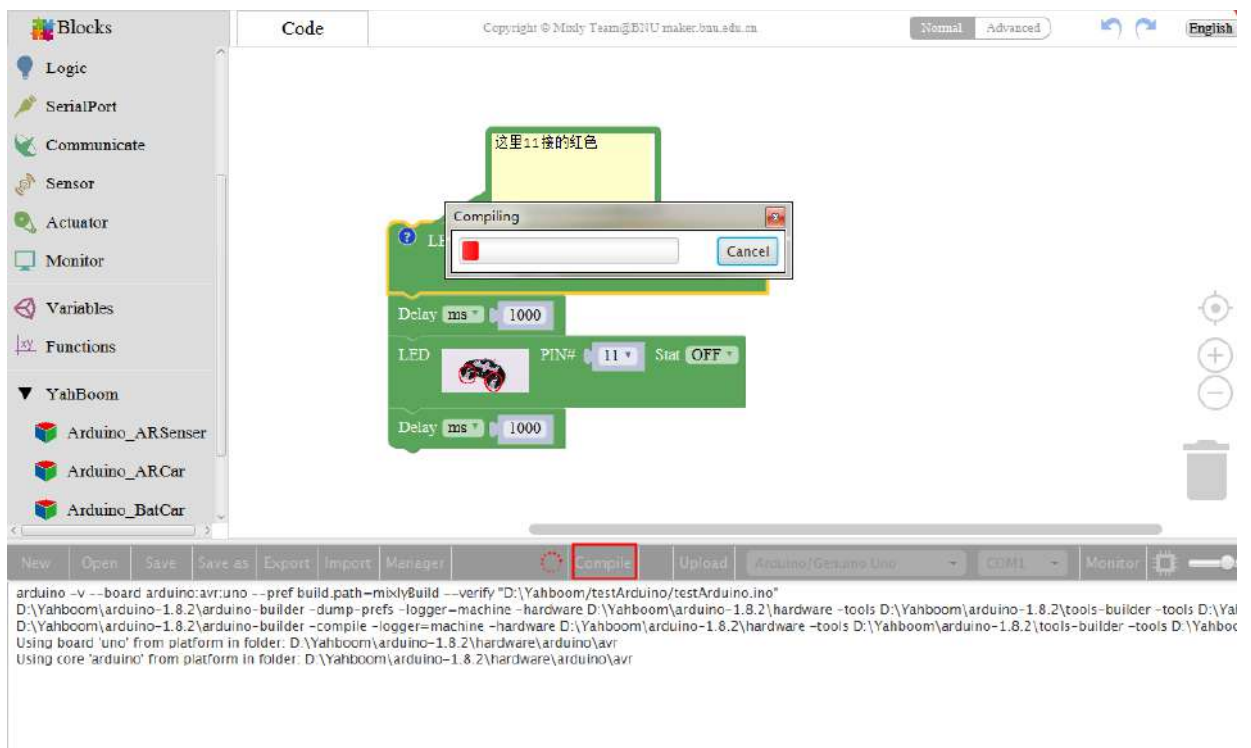


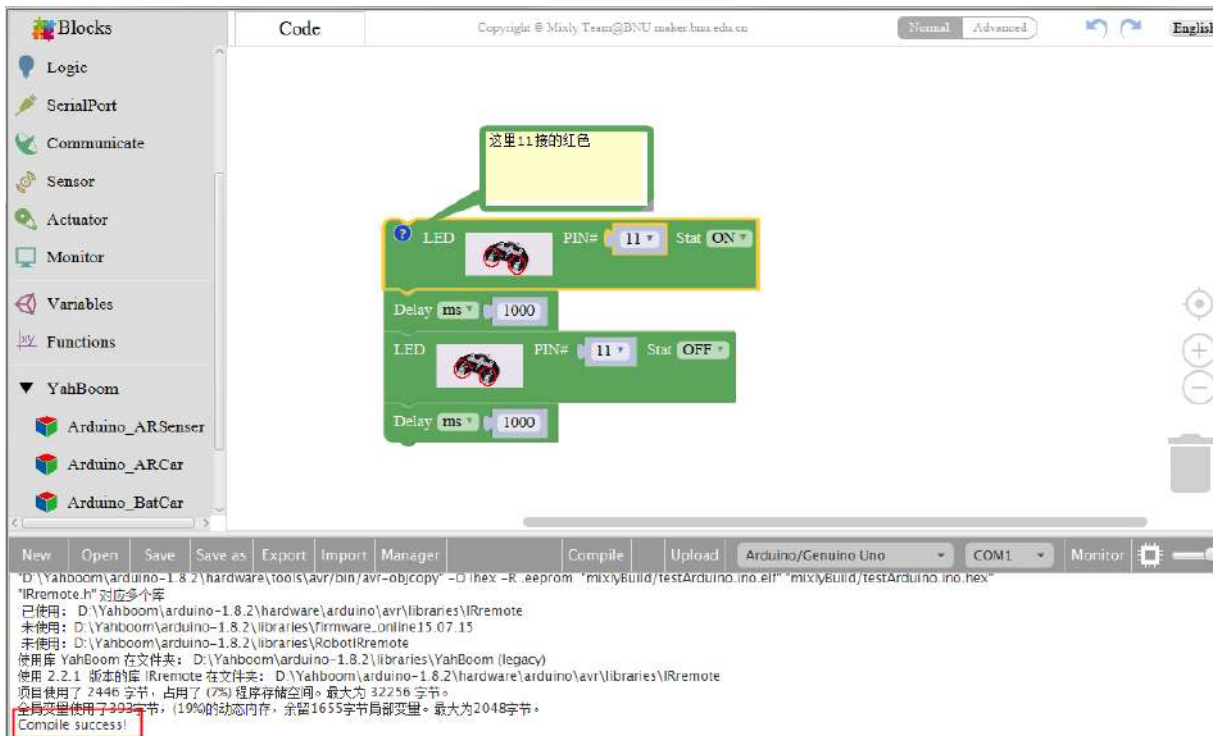
1、 Experimental building blocks :



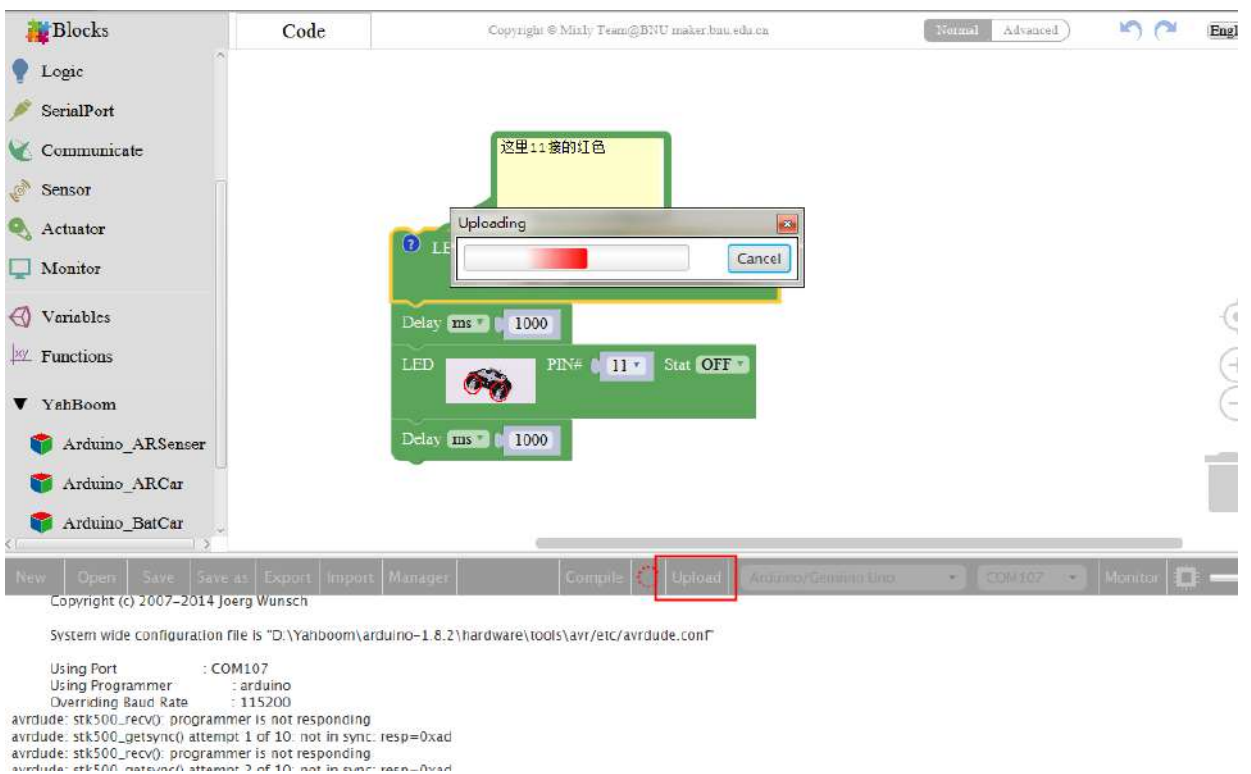


2、Experimental verification :





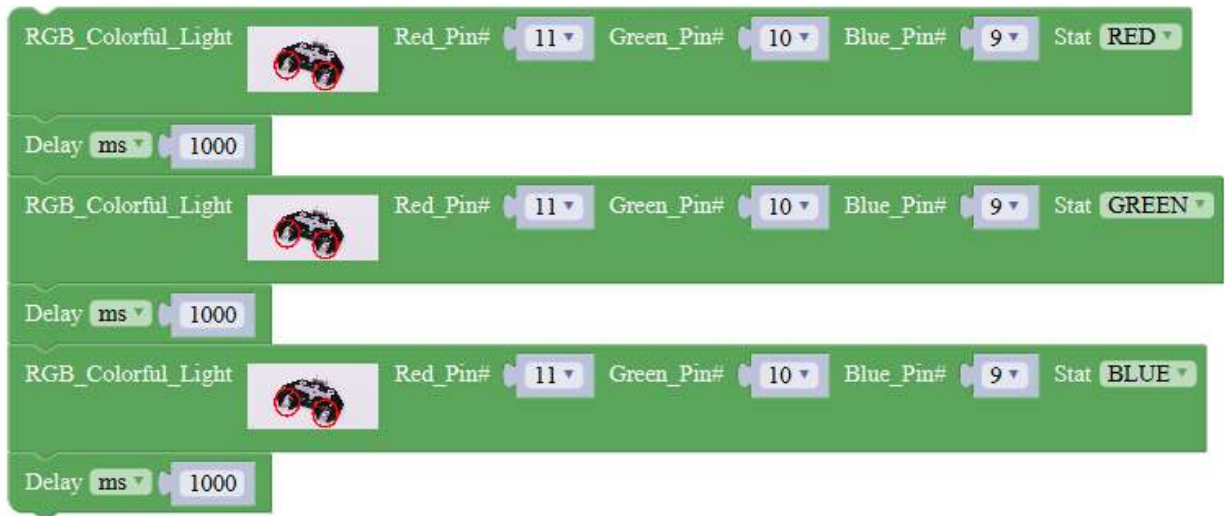
- After splicing, select the compile button above the picture, wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.
- After compiled , select **Arduino/Genuino Uno** follow the picture, selects the serial number of the corresponding board.
- After configured,select the upload button above the picture, wait for the following box prompt the upload successfully. Observe whether the light blinks in 1 second interval on the broad, we can change the time, and try the above steps to compile upload again, try the effect.



2- Colorful light

Follow the steps to splice the building blocks in 3 ways :

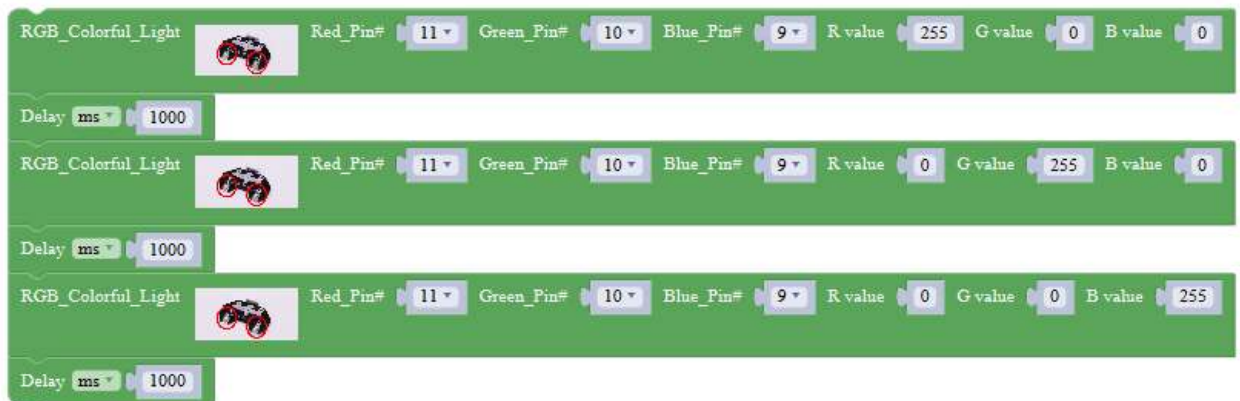
The first way:



The first way uses the 'RGB Colorful Light' block with a 'Stat' dropdown menu. The sequence is as follows:

- Block 1: RGB_Colorful_Light (Red_Pin# 11, Green_Pin# 10, Blue_Pin# 9, Stat RED)
- Block 2: Delay ms 1000
- Block 3: RGB_Colorful_Light (Red_Pin# 11, Green_Pin# 10, Blue_Pin# 9, Stat GREEN)
- Block 4: Delay ms 1000
- Block 5: RGB_Colorful_Light (Red_Pin# 11, Green_Pin# 10, Blue_Pin# 9, Stat BLUE)
- Block 6: Delay ms 1000

The second way:



The second way uses the 'RGB Colorful Light' block with individual value inputs for Red, Green, and Blue. The sequence is as follows:

- Block 1: RGB_Colorful_Light (Red_Pin# 11, Green_Pin# 10, Blue_Pin# 9, R value 255, G value 0, B value 0)
- Block 2: Delay ms 1000
- Block 3: RGB_Colorful_Light (Red_Pin# 11, Green_Pin# 10, Blue_Pin# 9, R value 0, G value 255, B value 0)
- Block 4: Delay ms 1000
- Block 5: RGB_Colorful_Light (Red_Pin# 11, Green_Pin# 10, Blue_Pin# 9, R value 0, G value 0, B value 255)
- Block 6: Delay ms 1000

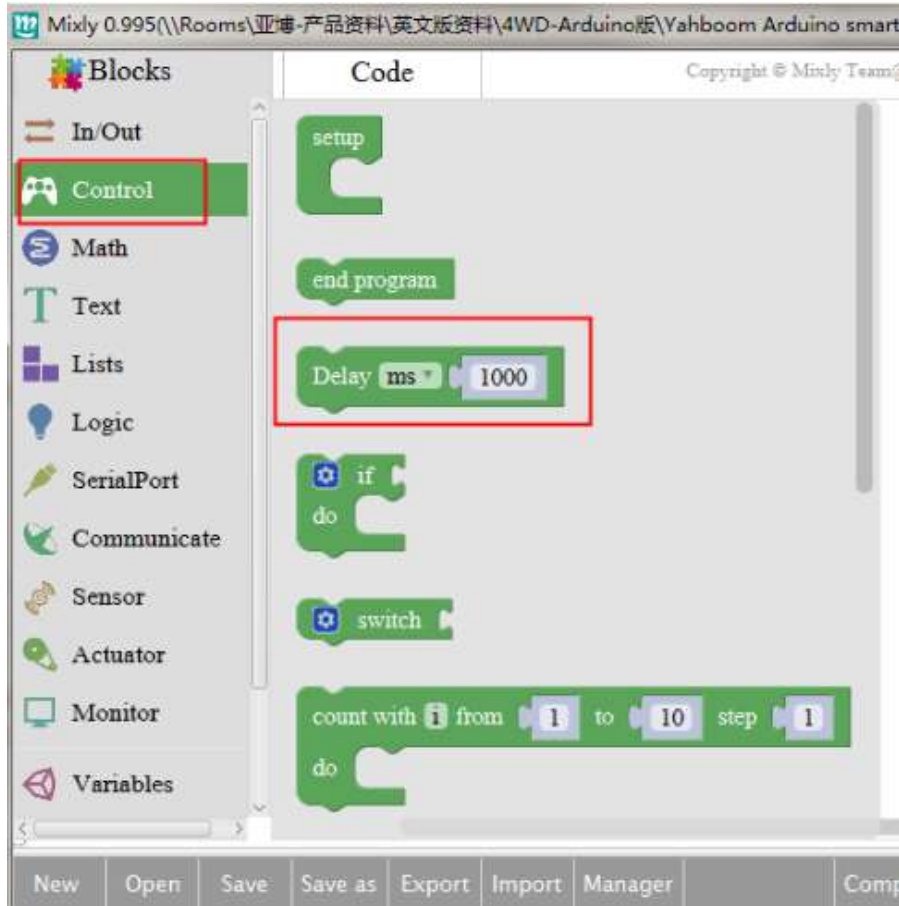
The third way:



The third way uses the 'RGB Colorful Light' block with color swatches for selection. The sequence is as follows:

- Block 1: RGB_Colorful_Light (Red_Pin# 11, Green_Pin# 10, Blue_Pin# 9, Red swatch)
- Block 2: Delay ms 1000
- Block 3: RGB_Colorful_Light (Red_Pin# 11, Green_Pin# 10, Blue_Pin# 9, Yellow swatch)
- Block 4: Delay ms 1000
- Block 5: RGB_Colorful_Light (Red_Pin# 11, Green_Pin# 10, Blue_Pin# 9, Green swatch)
- Block 6: Delay ms 1000

1、Experimental building blocks :



2、Experimental verification :



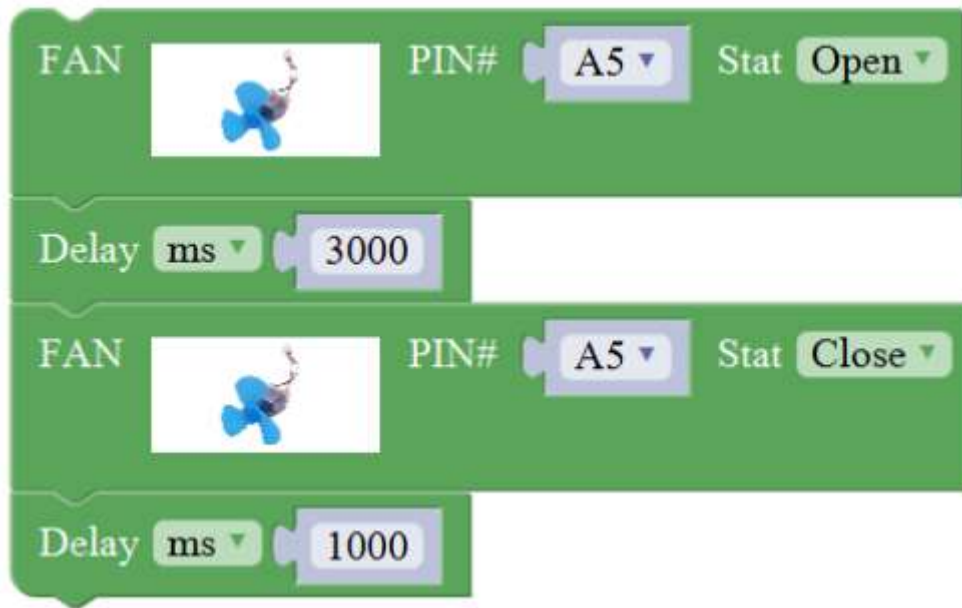
- a、 After splicing, select the compile button above the picture, wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.
- b、 After compiled , select **Arduino/Genuino Uno** follow the picture, selects the serial number of the corresponding board.



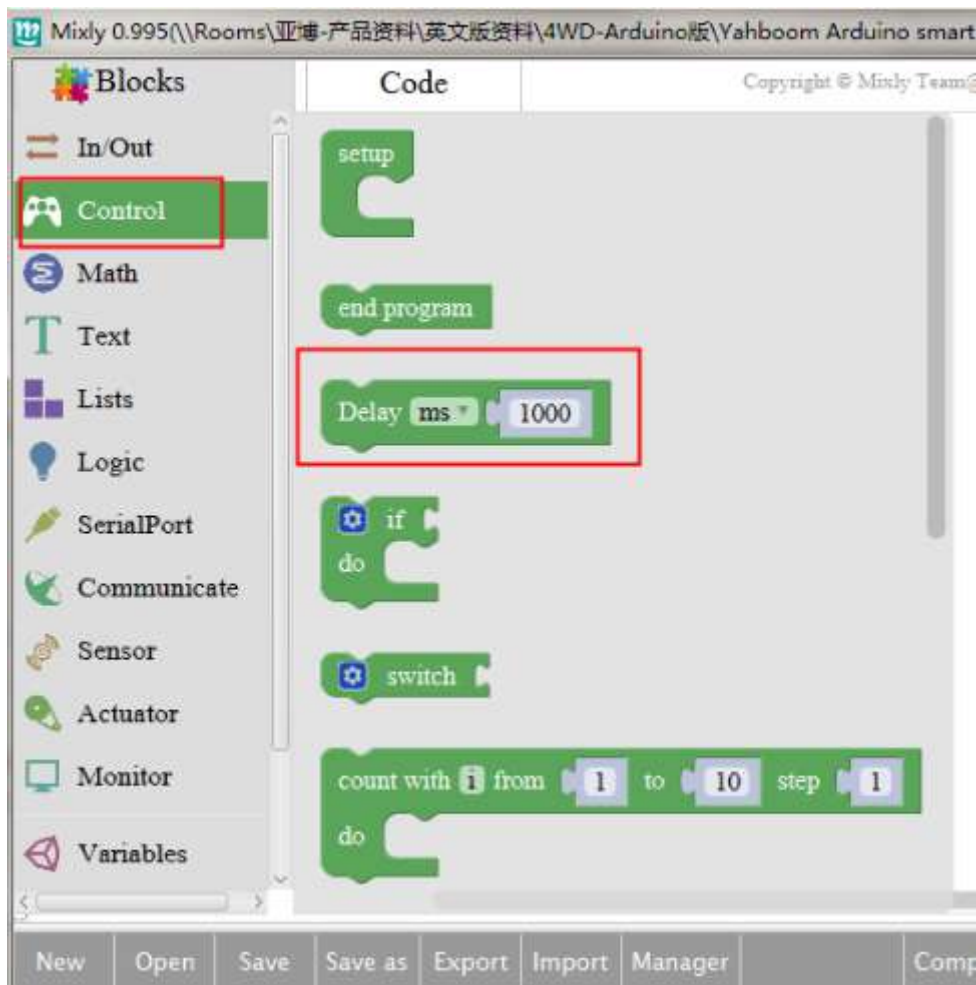
- c、 After configured,select the upload button above the picture, wait for the following box prompt the upload successfully. Observe whether the colorful light blinks in 1 second interval on the board, we can change the time, and try the above steps to compile upload again, try the effect.

3- Fan control

Follow the steps to splice the building blocks :



1、 Experimental building blocks :



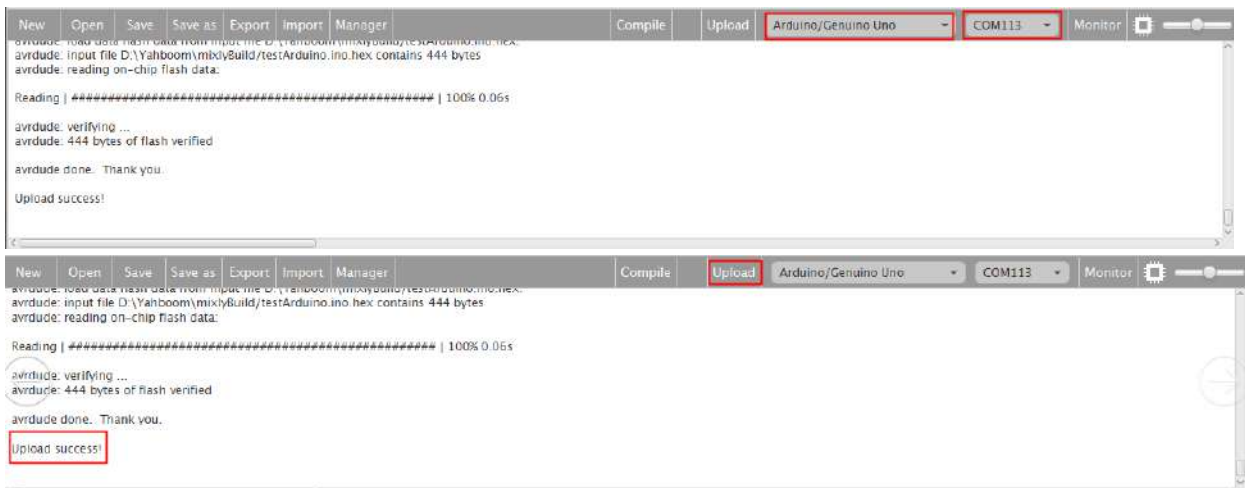


2、 Experimental verification :



a、 After splicing, select the compile button above the picture, wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

b、 After compiled , select **Arduino/Genuino Uno** follow the picture, selects the serial number of the corresponding board.



c、 After configured,select the upload button above the picture, wait for the following box prompt the upload successfully. Observe whether board fan rotates for 3 seconds and stops for 1 second, we can change the time, and try the above steps to compile upload again, try the effect.

4- Cloud Terrace control

Follow the steps to splice the building blocks :

The image shows three stacked 'Cloud Platform' building blocks. Each block has an icon of a blue robot and three configuration fields: 'Port #', 'Degree (0~180)', and 'Delay(ms)'. The values for each block are as follows:

Block	Port #	Degree (0~180)	Delay(ms)
1	3	0	2000
2	3	90	2000
3	3	180	2000

1、 Experimental building blocks :

The screenshot shows a block-based programming environment with a left sidebar and a main workspace. The sidebar includes categories like Lists, Logic, SerialPort, Communicate, Sensor, Actuator, Monitor, Variables, Functions, and YehBoom. Under YehBoom, several blocks are listed, with 'Arduino_4WDCar' highlighted in a red box. The main workspace contains three blocks:

- RGB_Colorful_Light**: A block with three input fields for 'Red_Pin#', 'Green_Pin#', and 'Blue_Pin#', each set to 0. It has a red LED icon.
- Cloud Platform**: A block with three input fields: 'Port #' (0), 'Degree (0~180)' (0), and 'Delay(ms)' (0). It is highlighted with a red border.
- MANIPULATOR**: A block with three input fields: 'Port #' (0), 'Degree (0~180)' (0), and 'Delay(ms)' (0). It has a robot icon and is labeled 'Manipulator1'.

2、Experimental verification :



a、 After splicing, select the compile button above the picture, wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

b、 After compiled , select **Arduino/Genuino Uno** follow the picture, selects the serial number of the corresponding board.



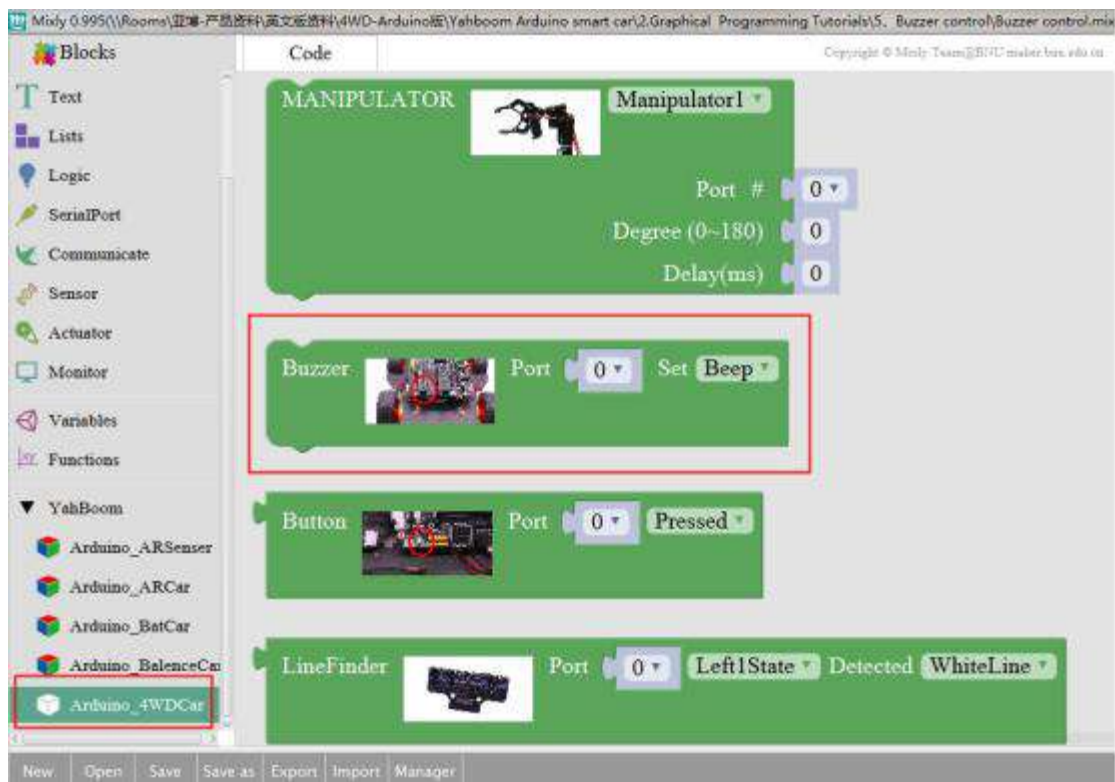
c、 After configured,select the upload button above the picture, wait for the following box prompt the upload successfully. Observe whether Cloud Terrace rotates 0 degrees to the right, then forward 90 degrees, and finally to the left 180 degrees ,we can change the degrees and time, and try the above steps to compile upload again, try the effect.

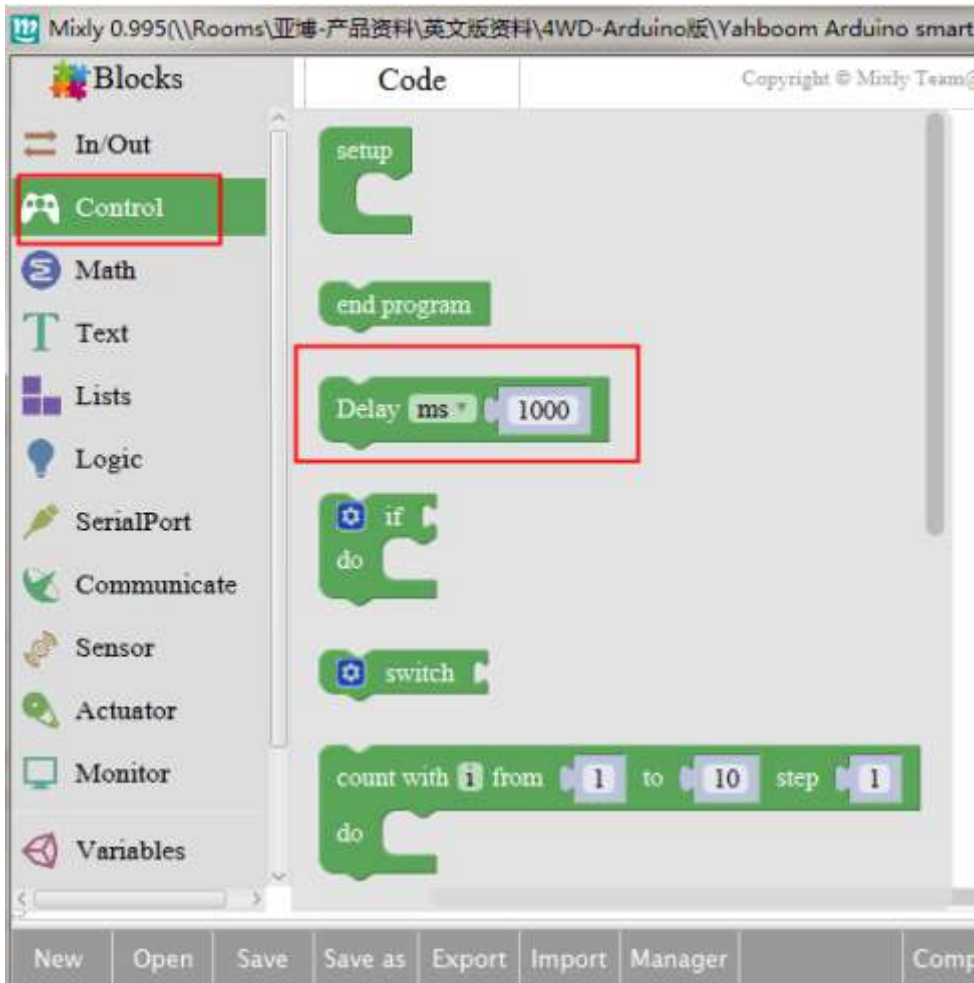
5- Buzzer control

Follow the steps to splice the building blocks :



1、 Experimental building blocks :



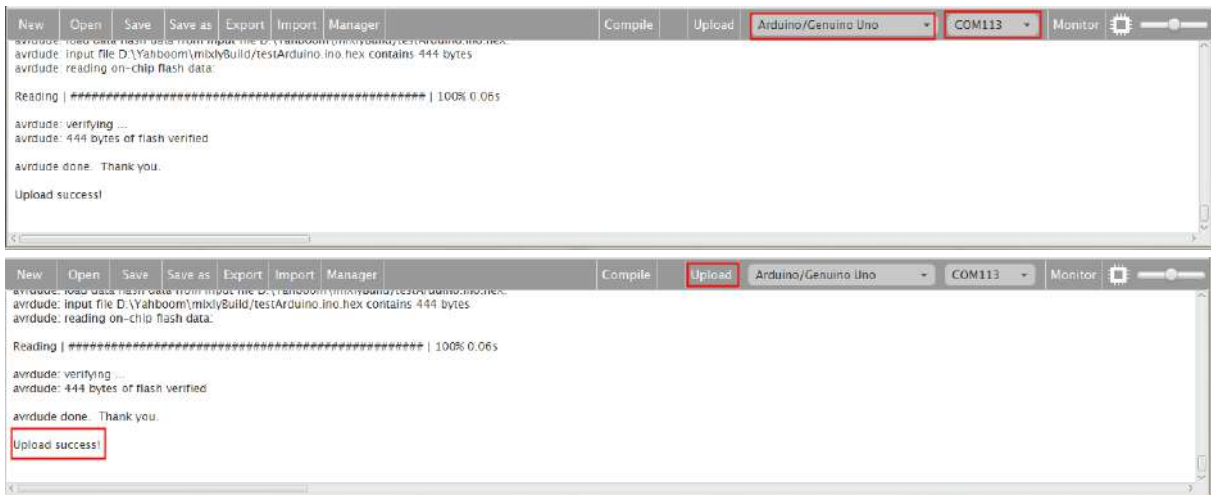


2、Experimental verification :



a、 After splicing, select the compile button above the picture, wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

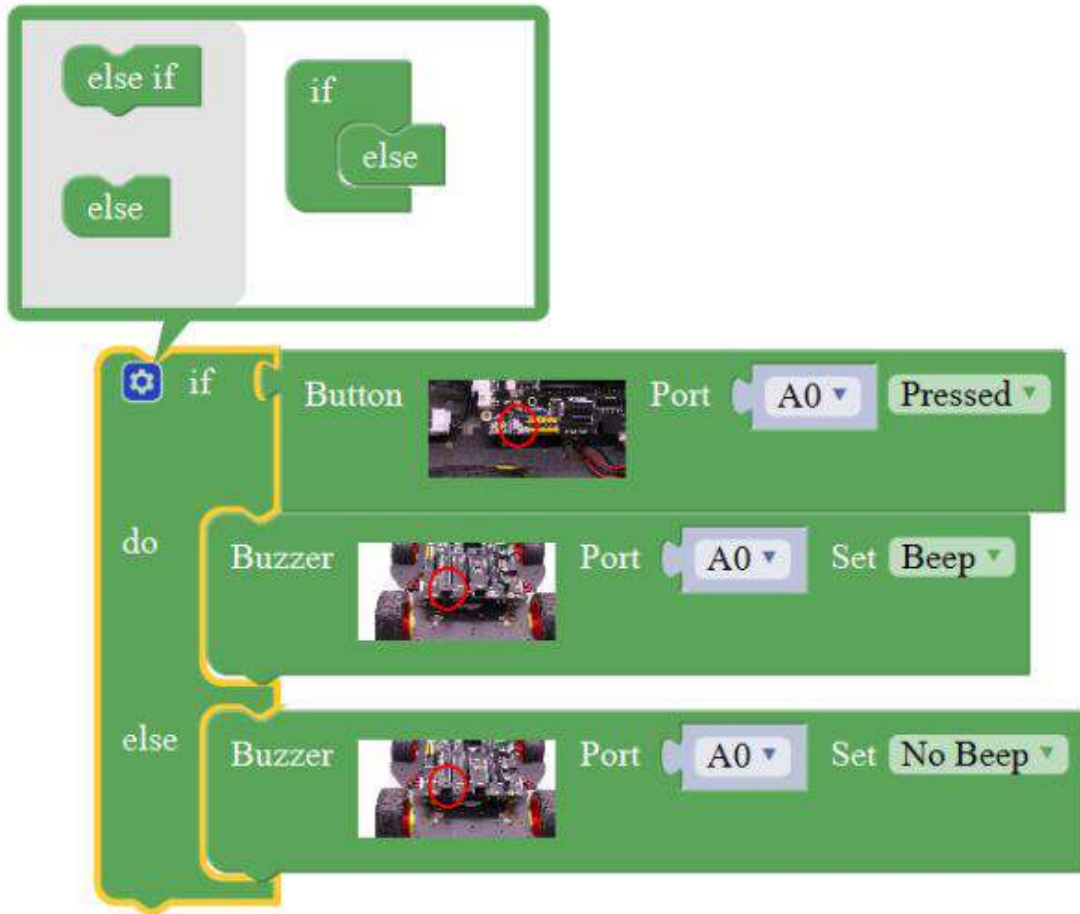
b、 After compiled , select **Arduino/Genuino Uno** follow the picture, selects the serial number of the corresponding board.



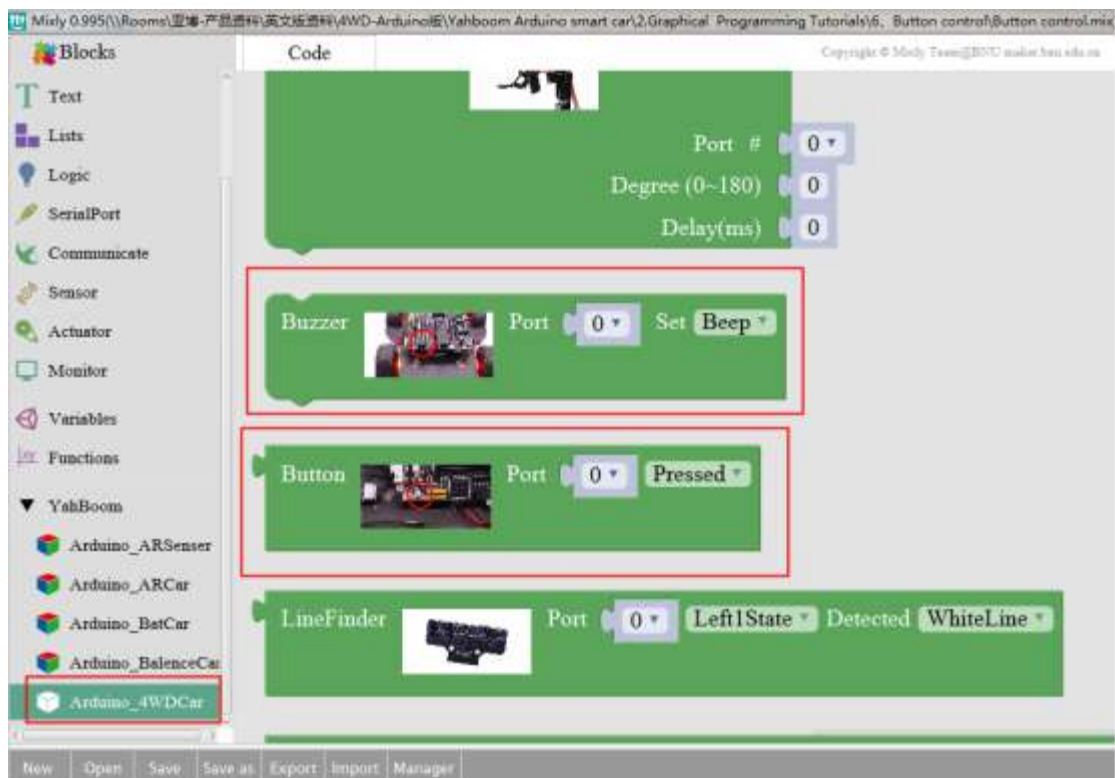
c、 After configured,select the upload button above the picture, wait for the following box prompt the upload successfully. Observe whether the buzzer calls once in a second,we can change the time, and try the above steps to compile upload again, try the effect.

6- Button control

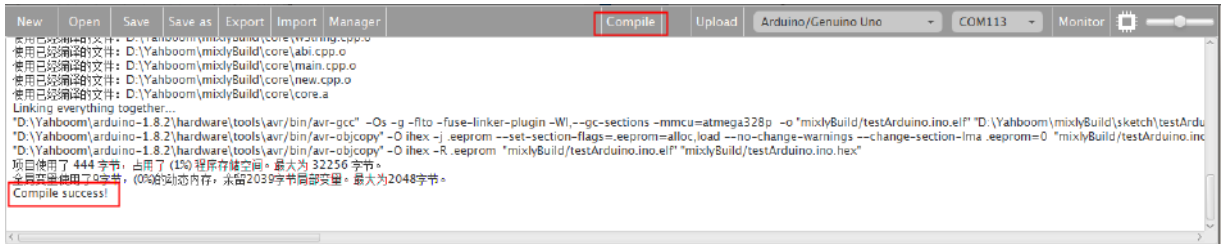
Follow the steps to splice the building blocks :



1、 Experimental building blocks :



2、Experimental verification :

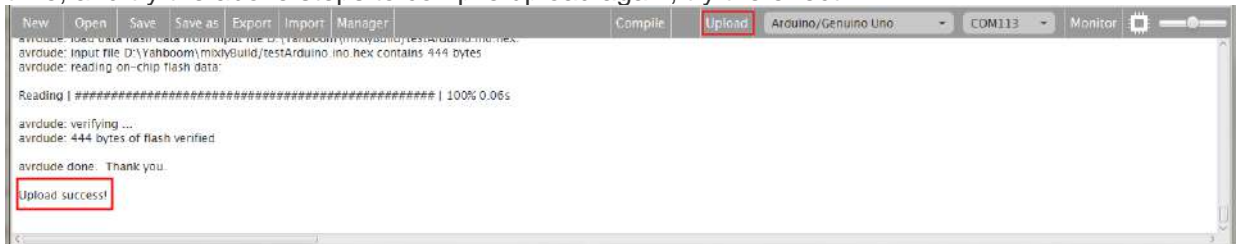


a、After splicing, select the compile button above the picture, wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

b、After compiled , select **Arduino/Genuino Uno** follow the picture, selects the serial number of the corresponding board.

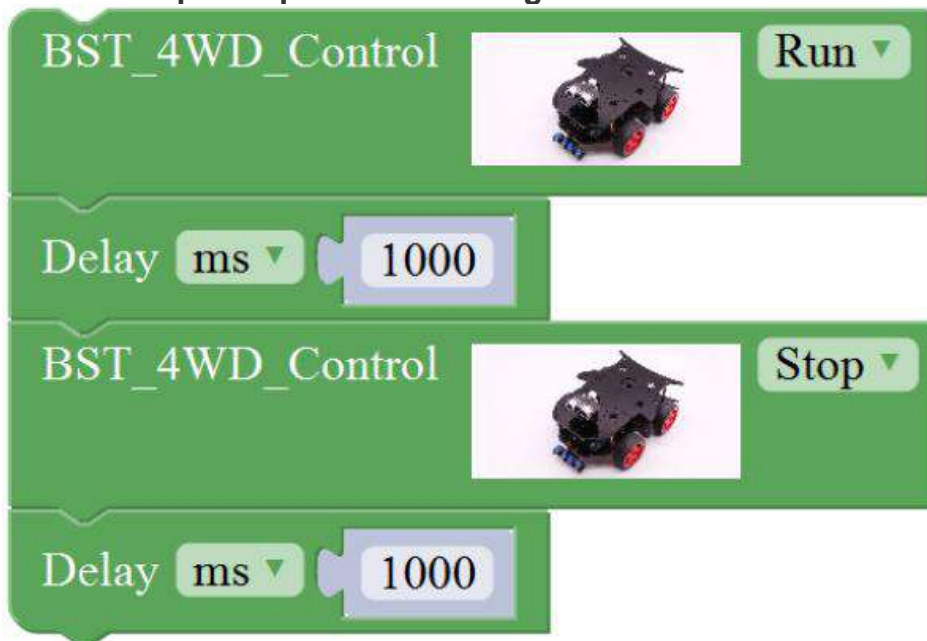


c、After configured,select the upload button above the picture, wait for the following box prompt the upload successfully. Observe whether the buzzer calls when pressing the button, we can change the time, and try the above steps to compile upload again, try the effect.



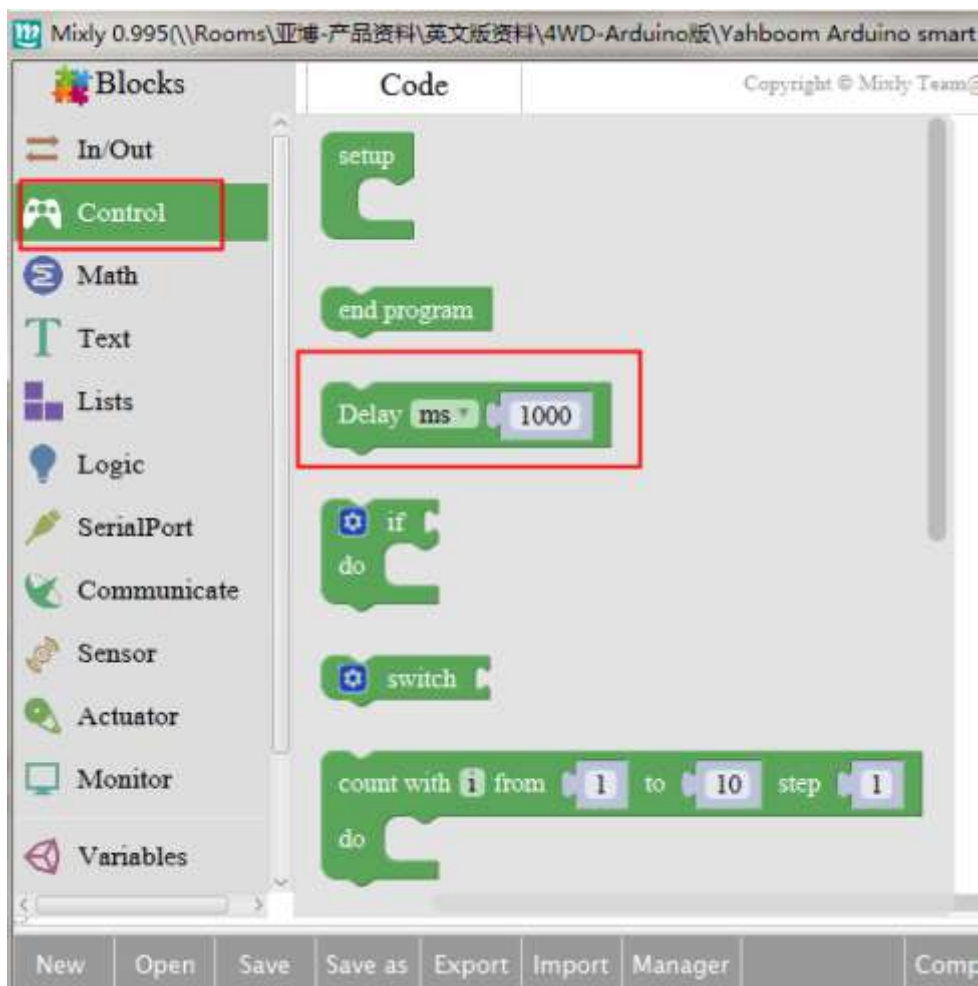
7- Car movement

Follow the steps to splice the building blocks



:

1、Experimental building blocks :





2、Experimental verification :



a、After splicing, select the compile button above the picture, wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

b、After compiled , select Arduino/Genuino Uno follow the picture, selects the serial number of the corresponding board.



c、After configured,select the upload button above the picture, wait for the following box prompt the upload successfully.Observe whether the car is forward one second, stop one second and continue to move forward, we can change the direction, and try the above steps to compile upload again, try the effect.

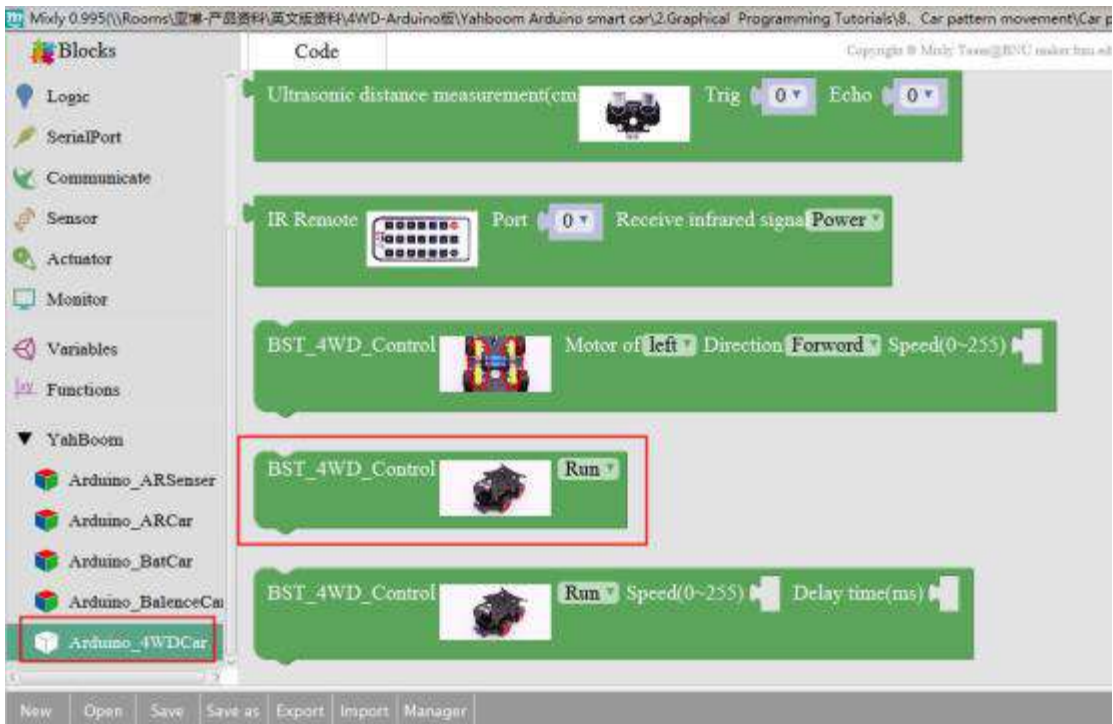
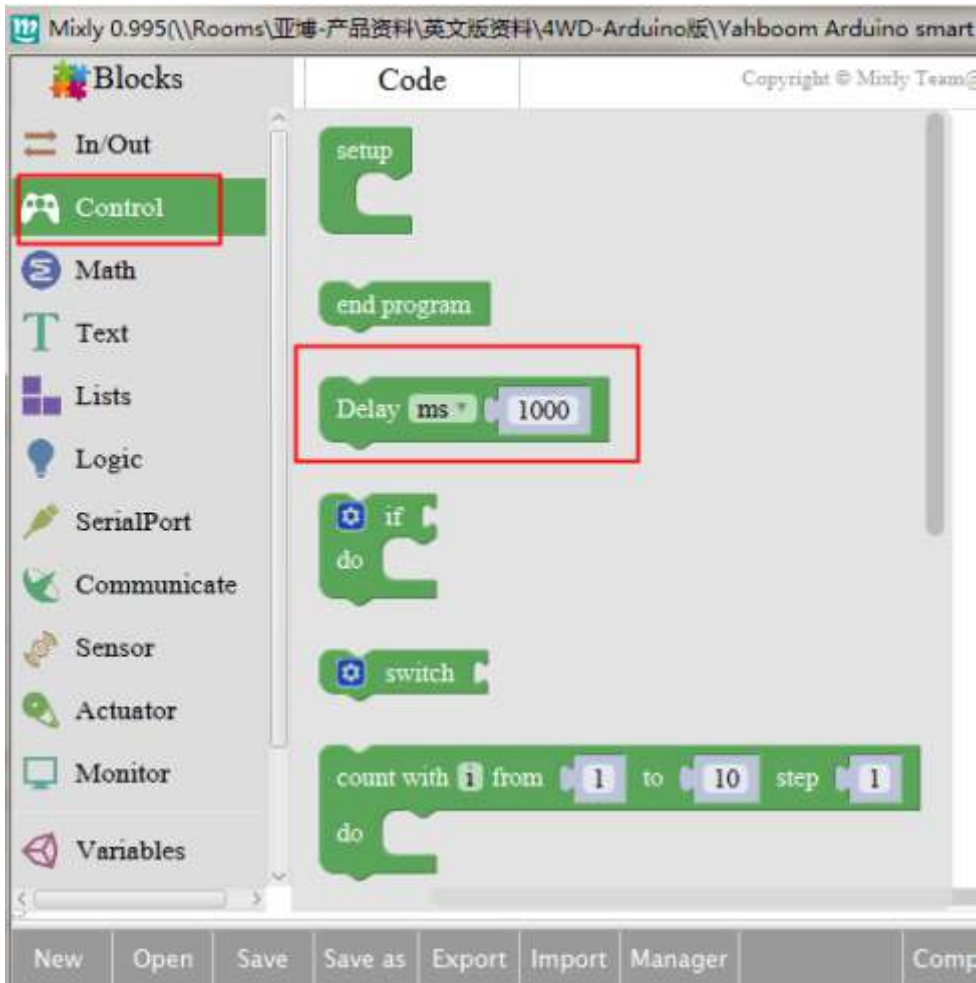


8- Car pattern movement

Follow the steps to splice the building blocks :



1、 Experimental building blocks :

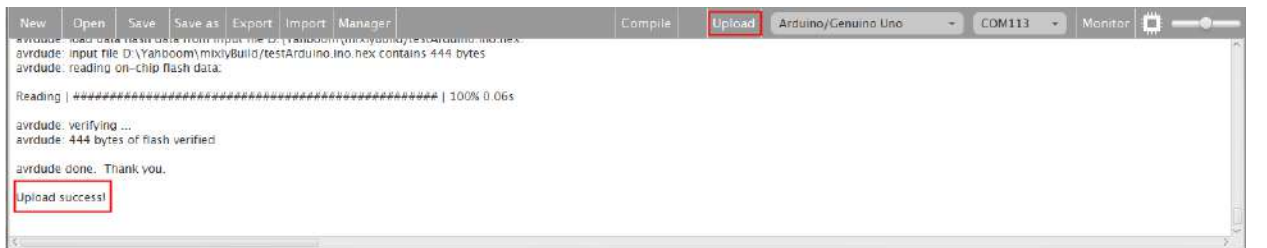
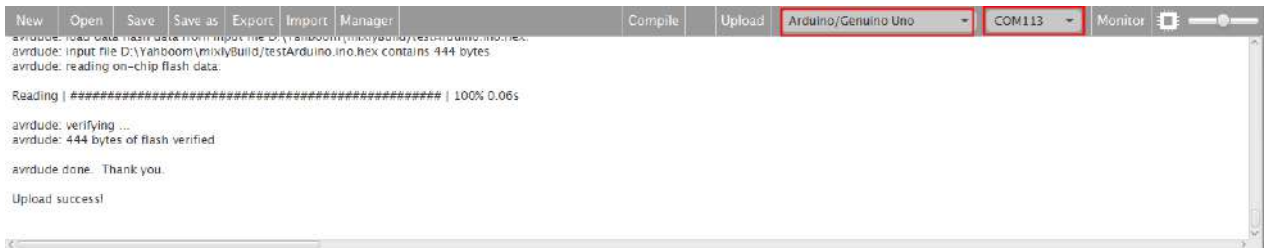


2、Experimental verification :



a、 After splicing, select the compile button above the picture, wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

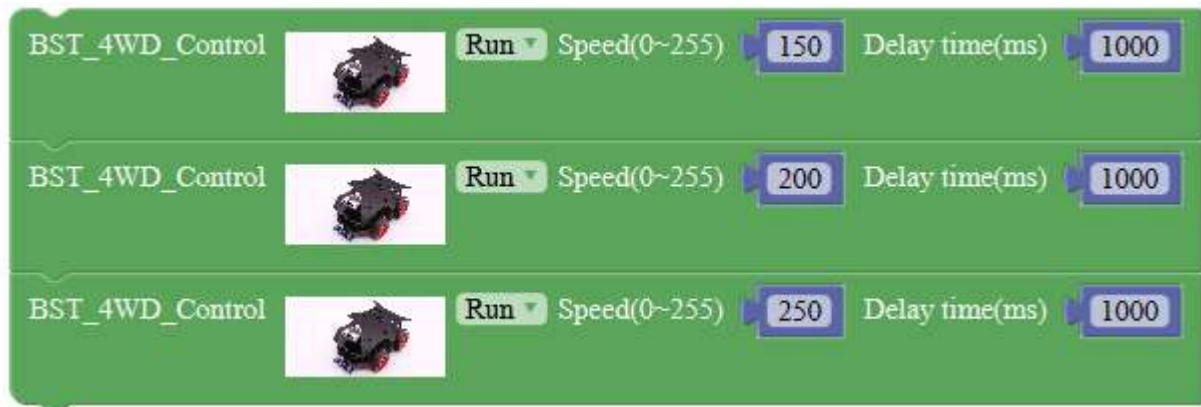
b、 After compiled , select **Arduino/Genuino Uno** follow the picture, selects the serial number of the corresponding board.



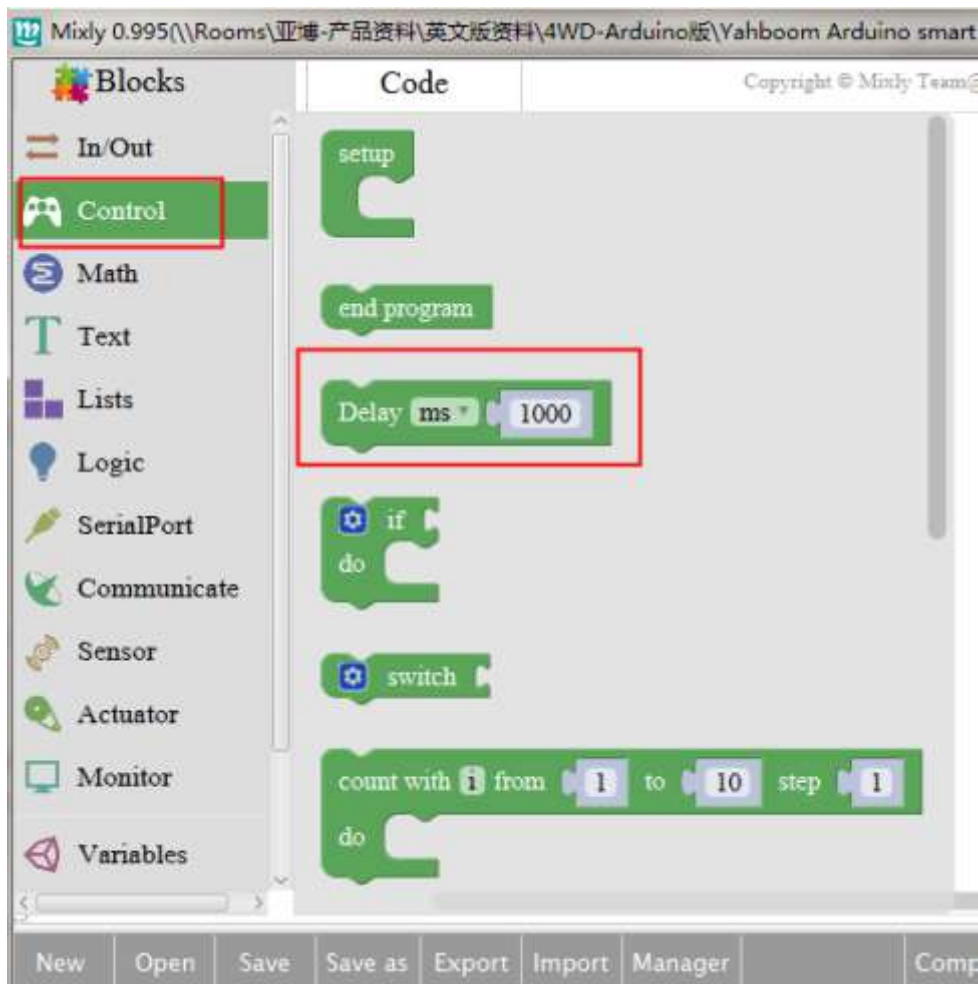
c、 After configured,select the upload button above the picture, wait for the following box prompt the upload successfully. Observe whether the car is left and right, left and right one second, and then repeat the front steps, we can change the direction and time, and try the above steps to compile upload again, try the effect.

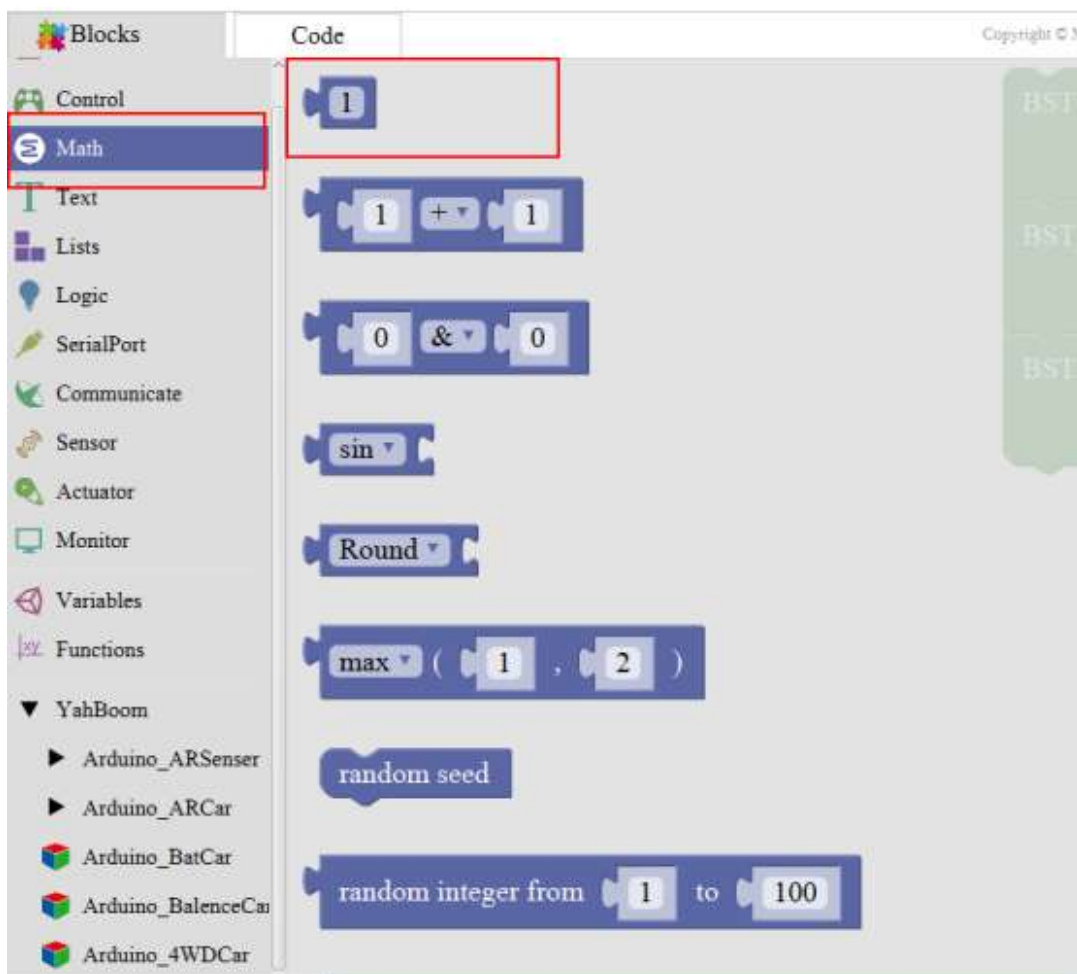
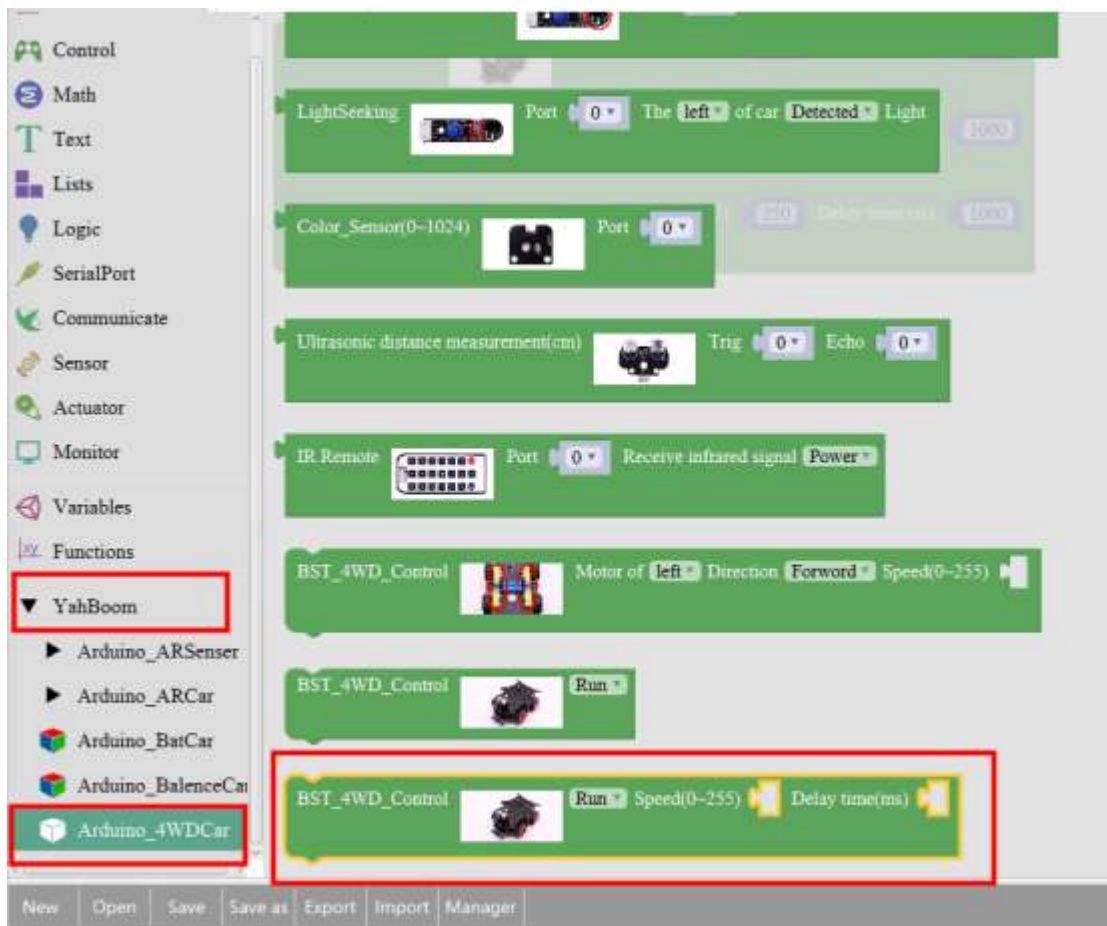
9- Speed control of car movement

Follow the steps to splice the building blocks :



1、 Experimental building blocks :



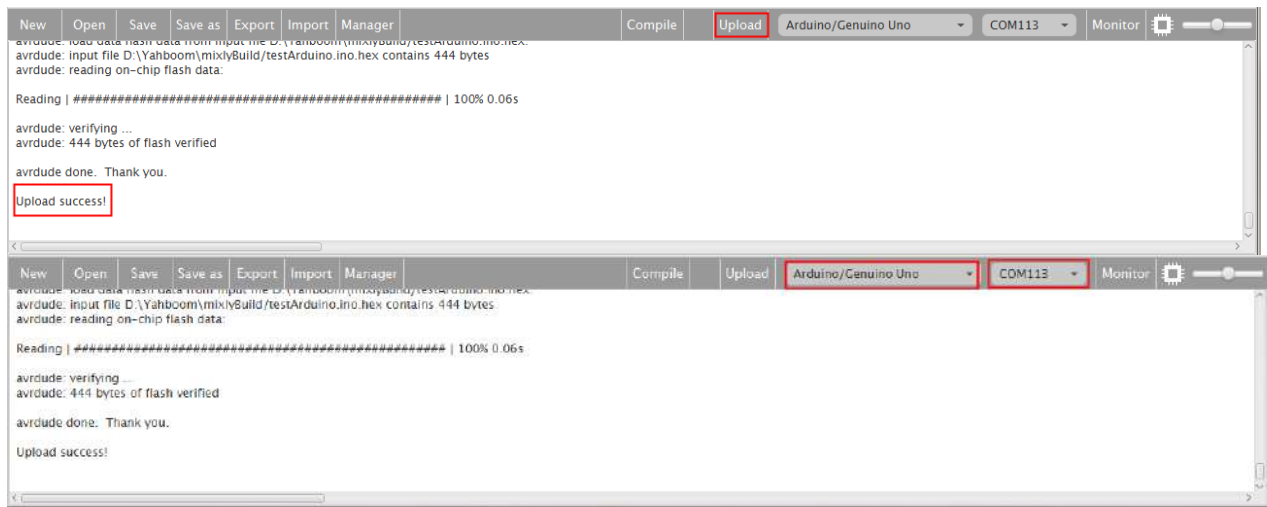


2、Experimental verification :



a、After splicing, select the compile button above the picture, wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

b、After compiled , select Arduino/Genuino Uno follow the picture, selects the serial number of the corresponding board.



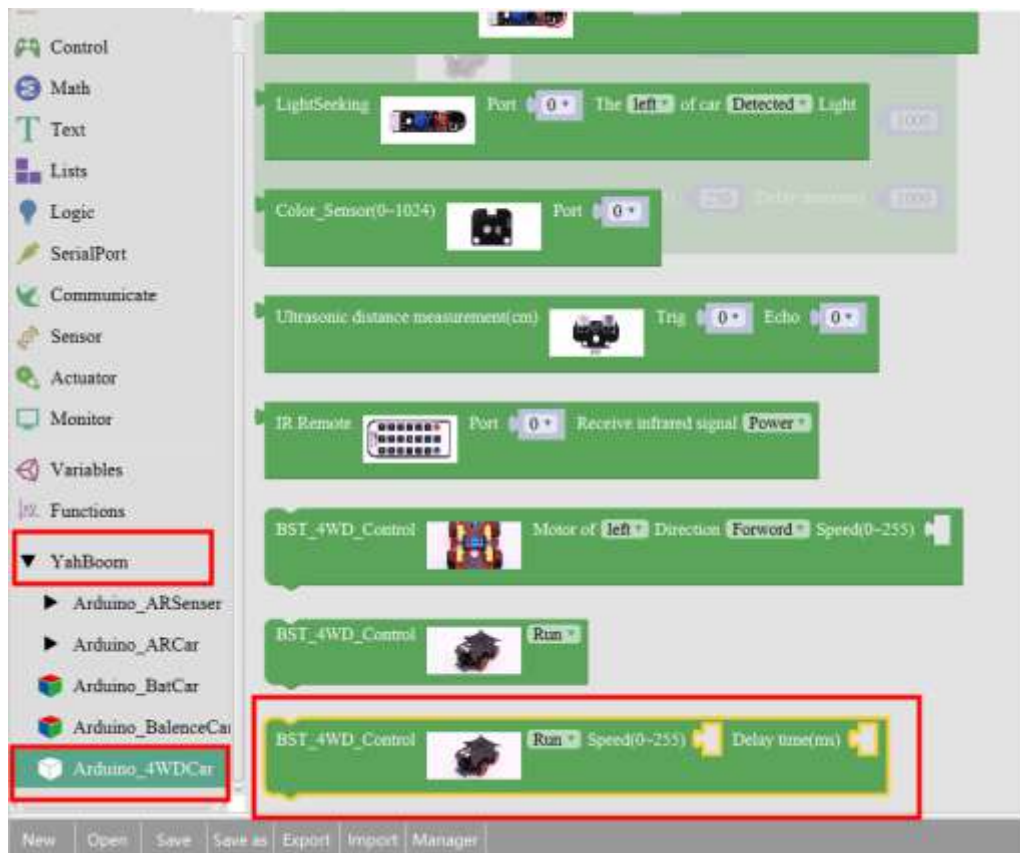
c、After configured,select the upload button above the picture, wait for the following box prompt the upload successfully. Observe whether the car three speeds gradually increase the effect, and then go back to the slowest speed repeat the front steps, we can change the direction and time, and try the above steps to compile upload again, try the effect.

10- Infrared obstacle avoidance

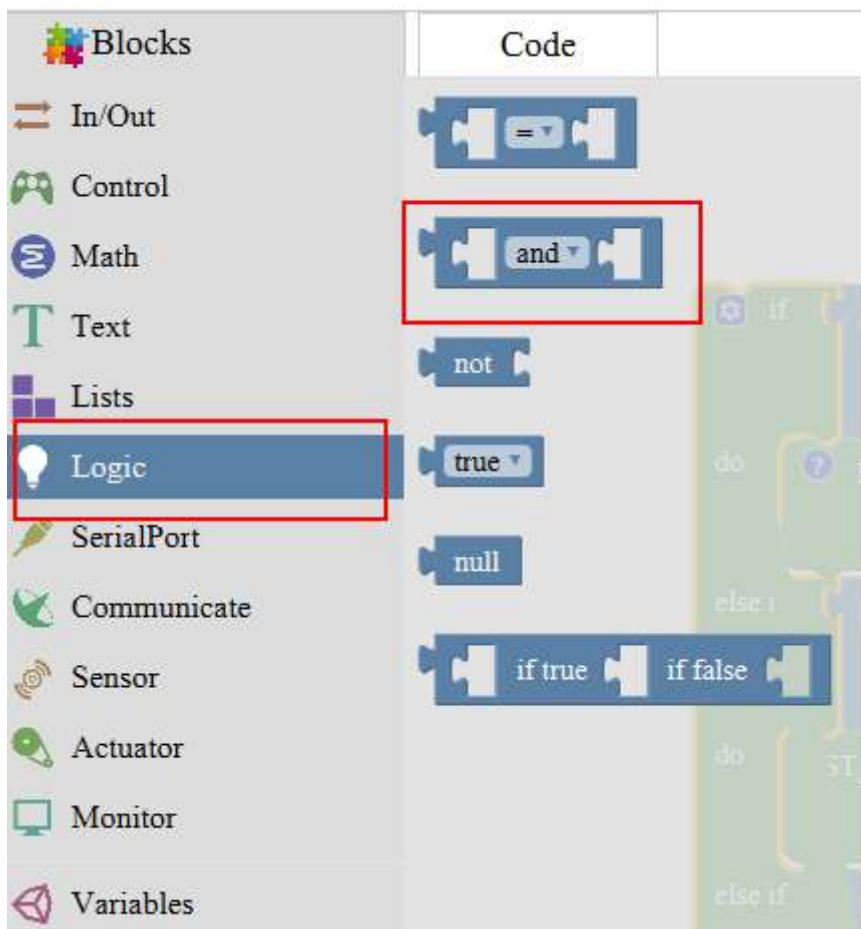
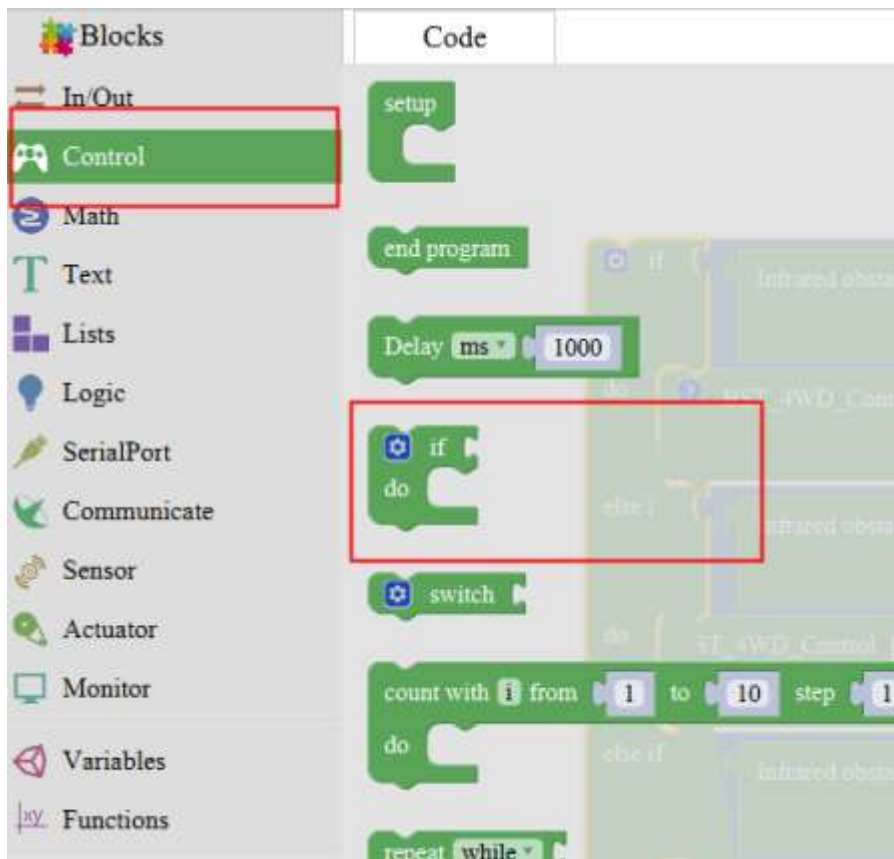
Follow the steps to splice the building blocks :



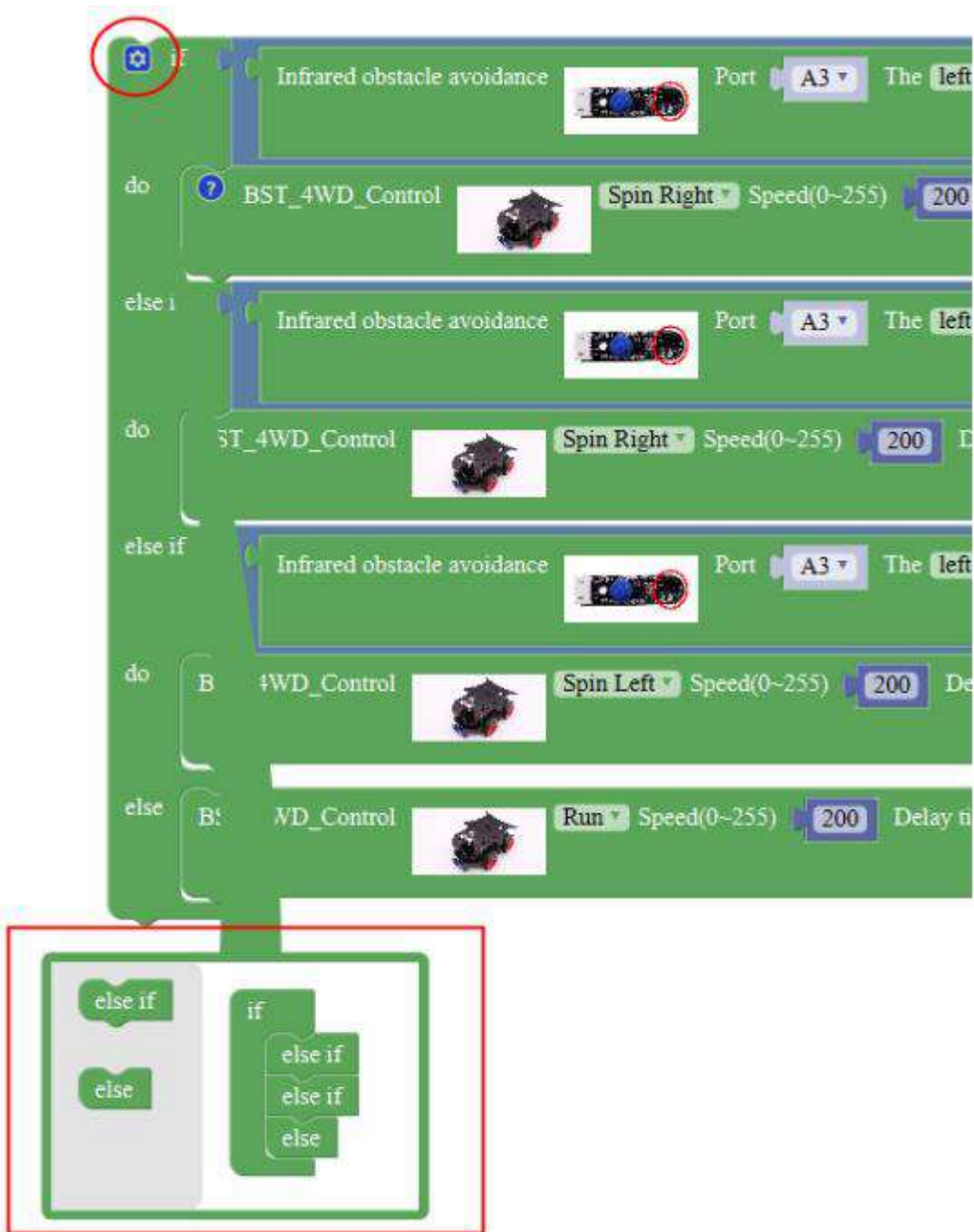
1、Experimental building blocks :







Note:

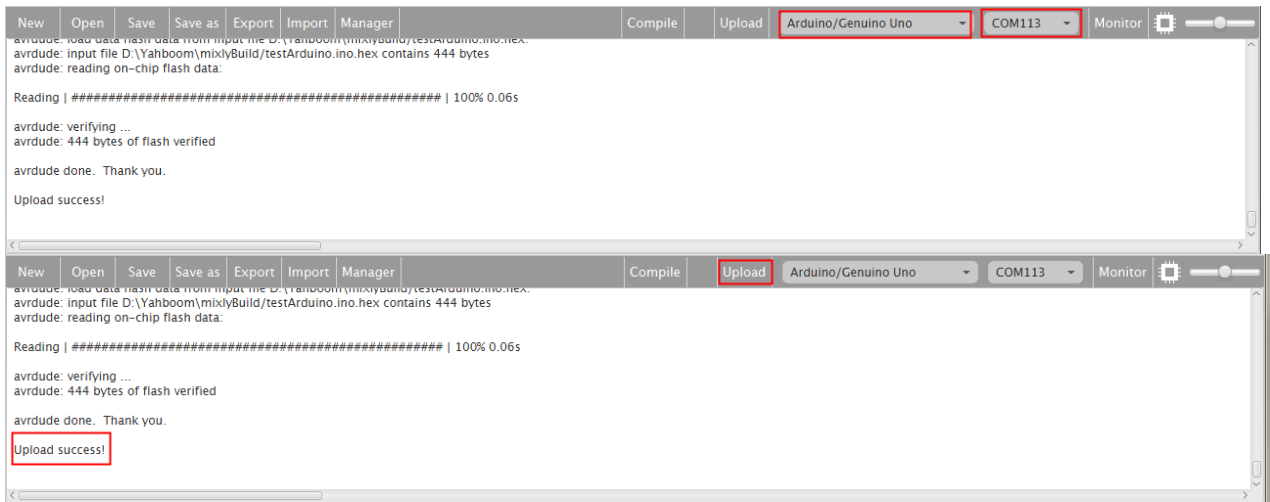


2、Experimental verification :



a、 After splicing, select the compile button above the picture, wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

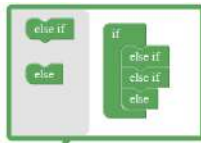
b、 After compiled , select **Arduino/Genuino Uno** follow the picture, selects the serial number of the corresponding board.



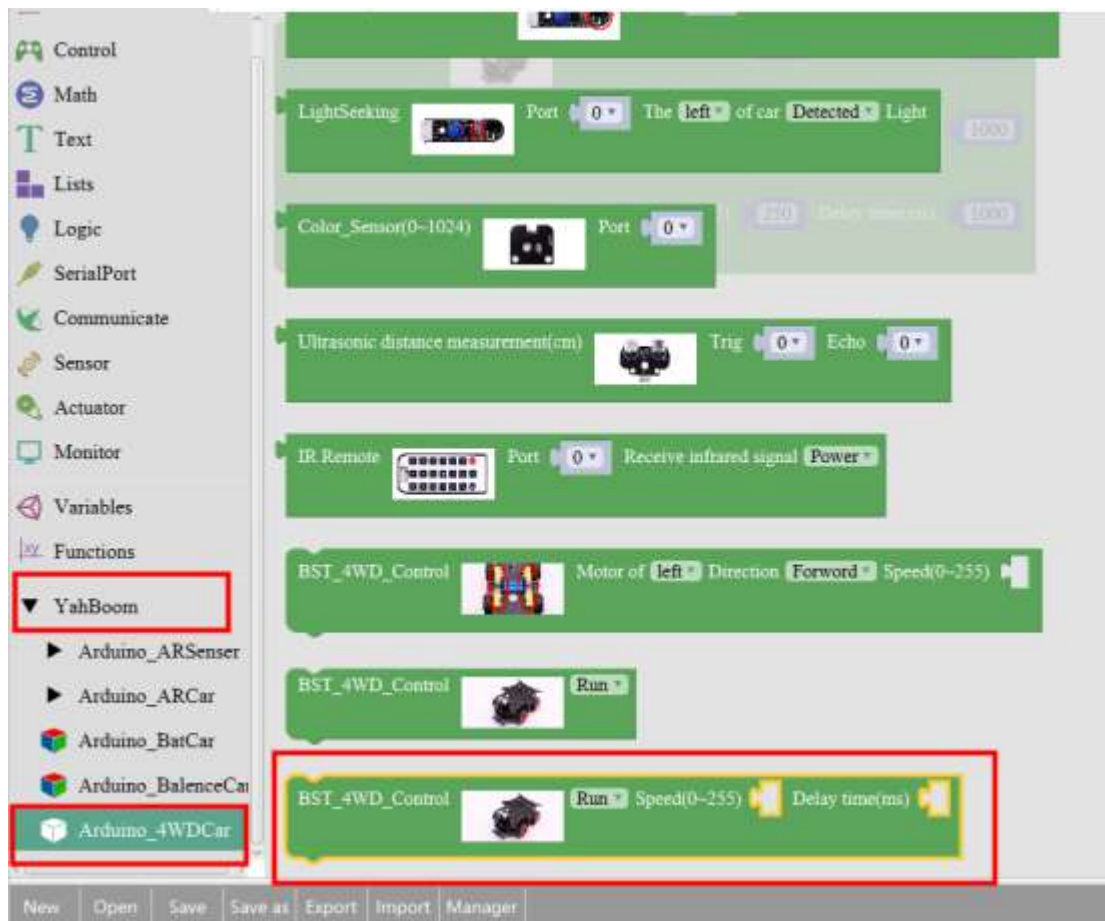
c、After configured,select the upload button above the picture, wait for the following box prompt the upload successfully. Debugging of infrared probe, infrared obstacle avoidance can be regulated by rotating potentiometer sensitivity distance, and then adjust the distance according to the speed, thus preventing excessive speed hit the barrier, put the car into the obstacle avoidance area, turn on the power, try the effect.

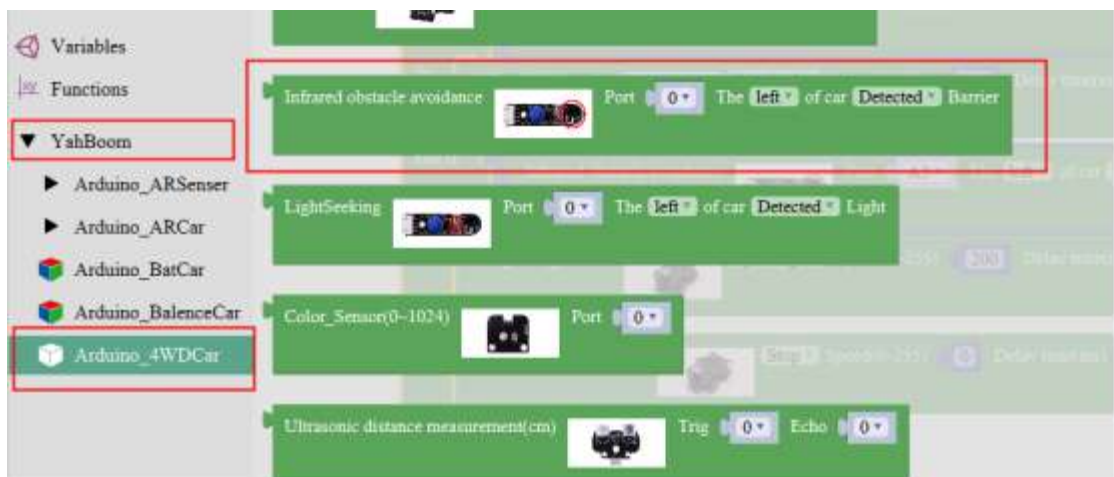
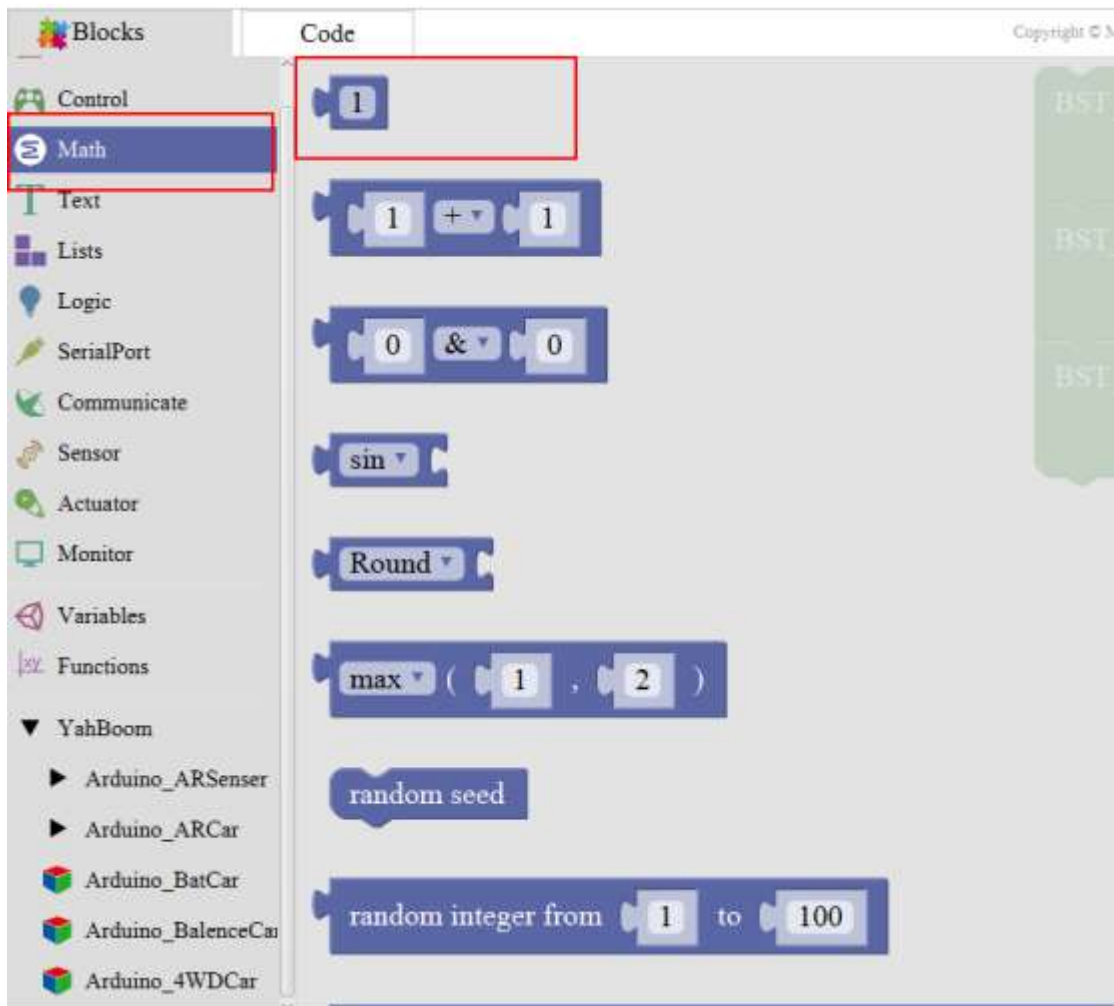
11- Infrared following

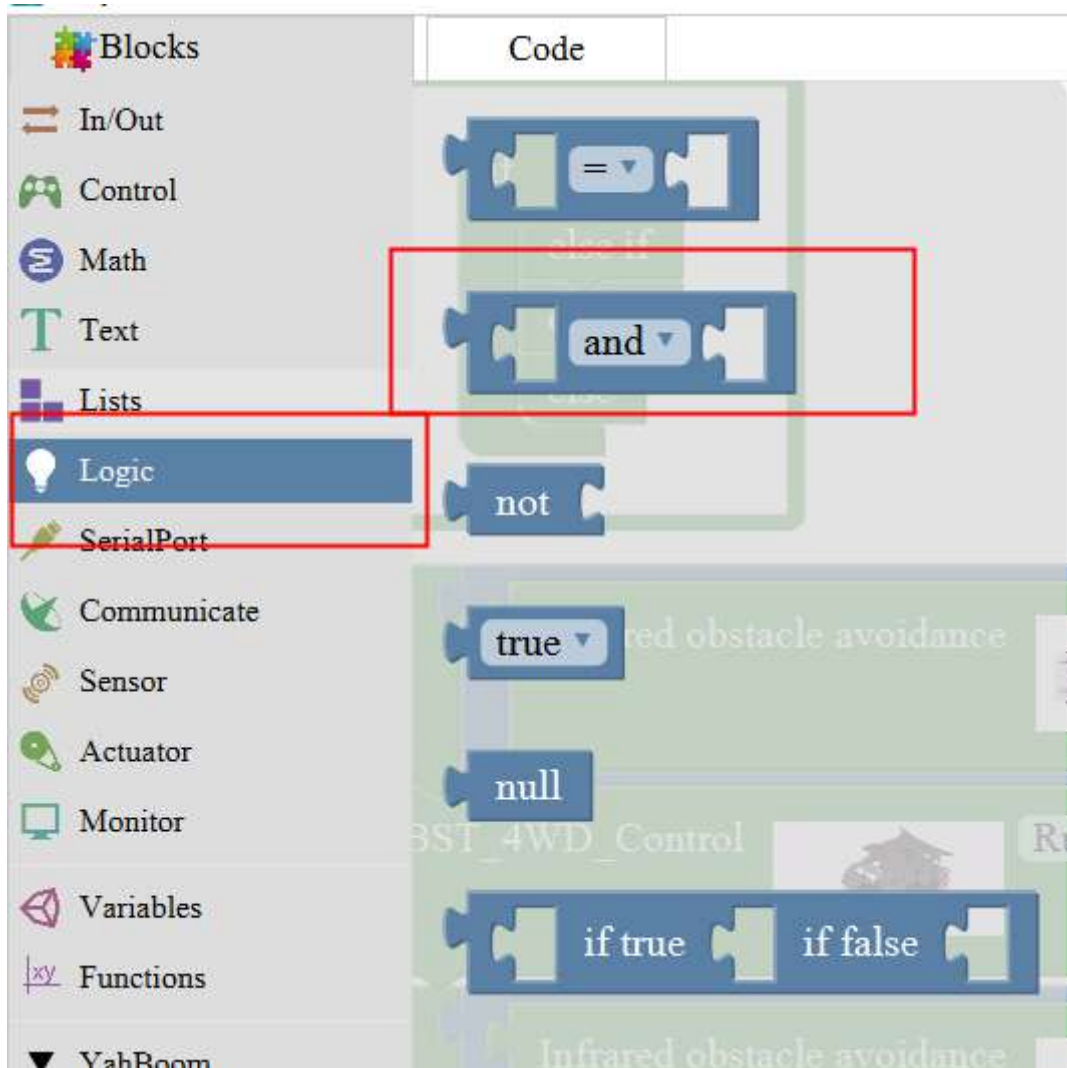
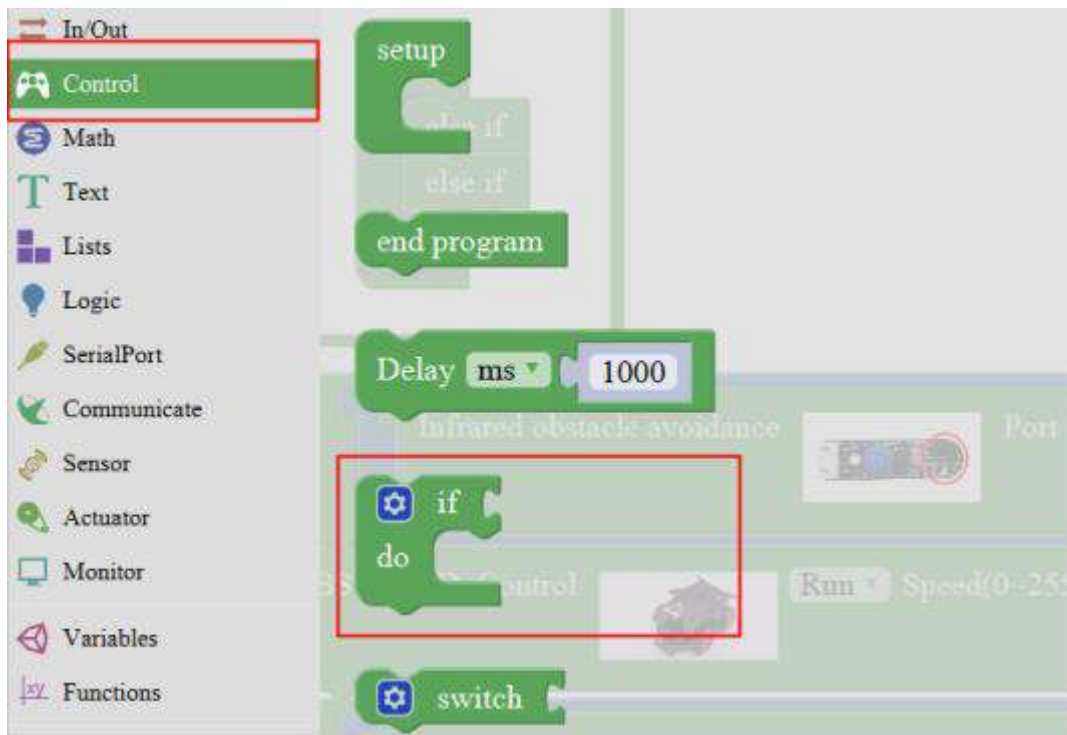
Follow the steps to splice the building blocks :



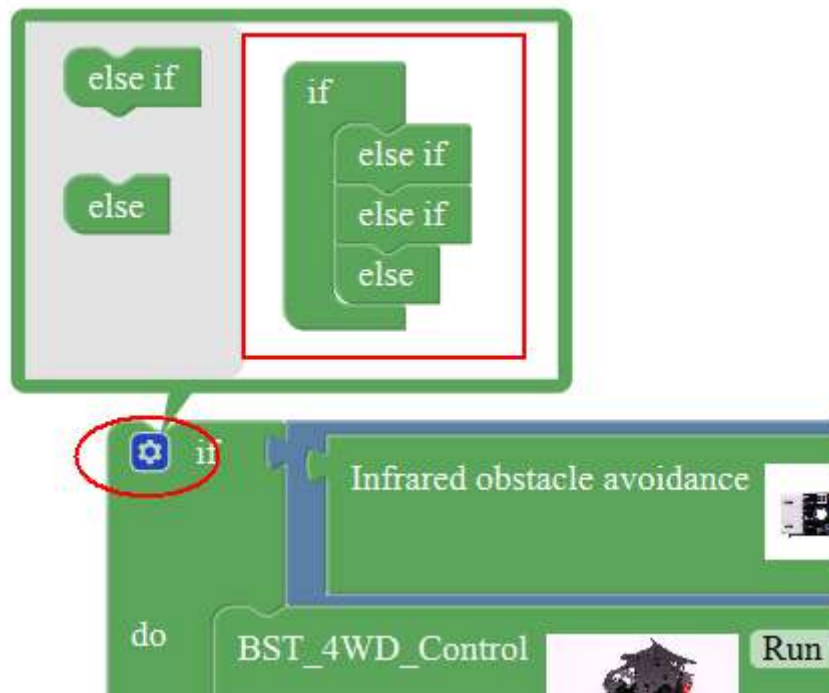
1、Experimental building blocks :







Note:

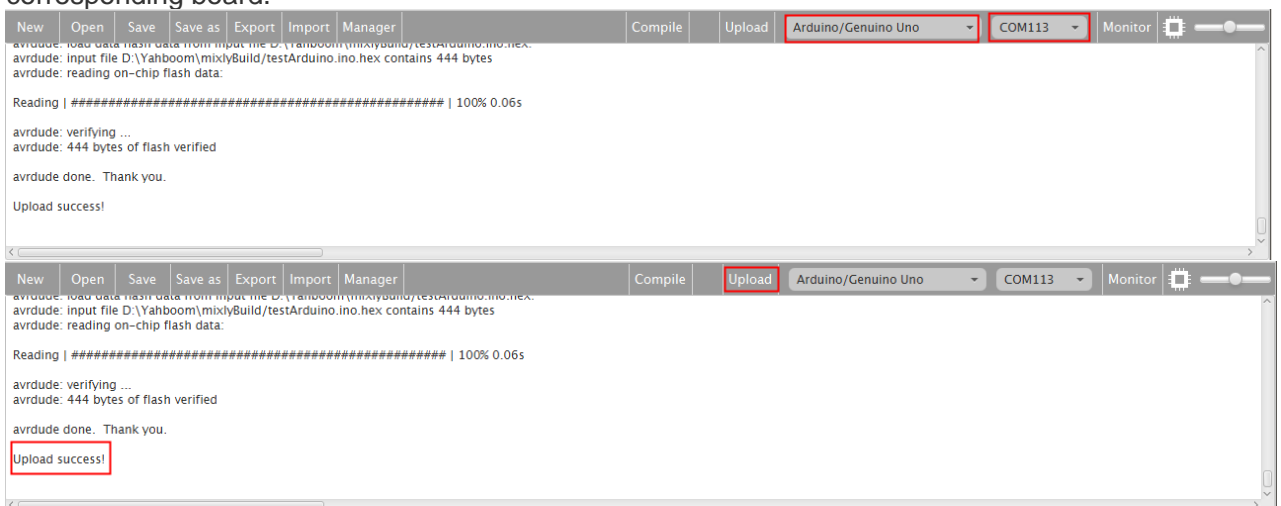


2、Experimental verification :



a、After splicing, select the compile button above the picture, wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

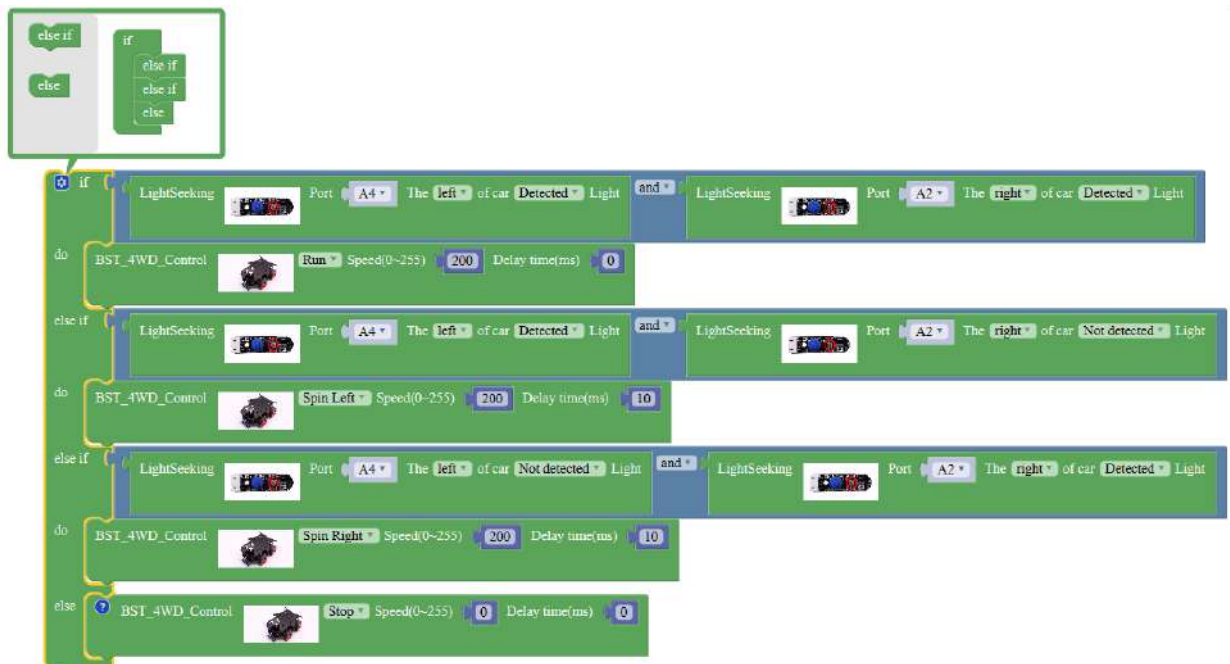
b、After compiled , select Arduino/Genuino Uno follow the picture, selects the serial number of the corresponding board.



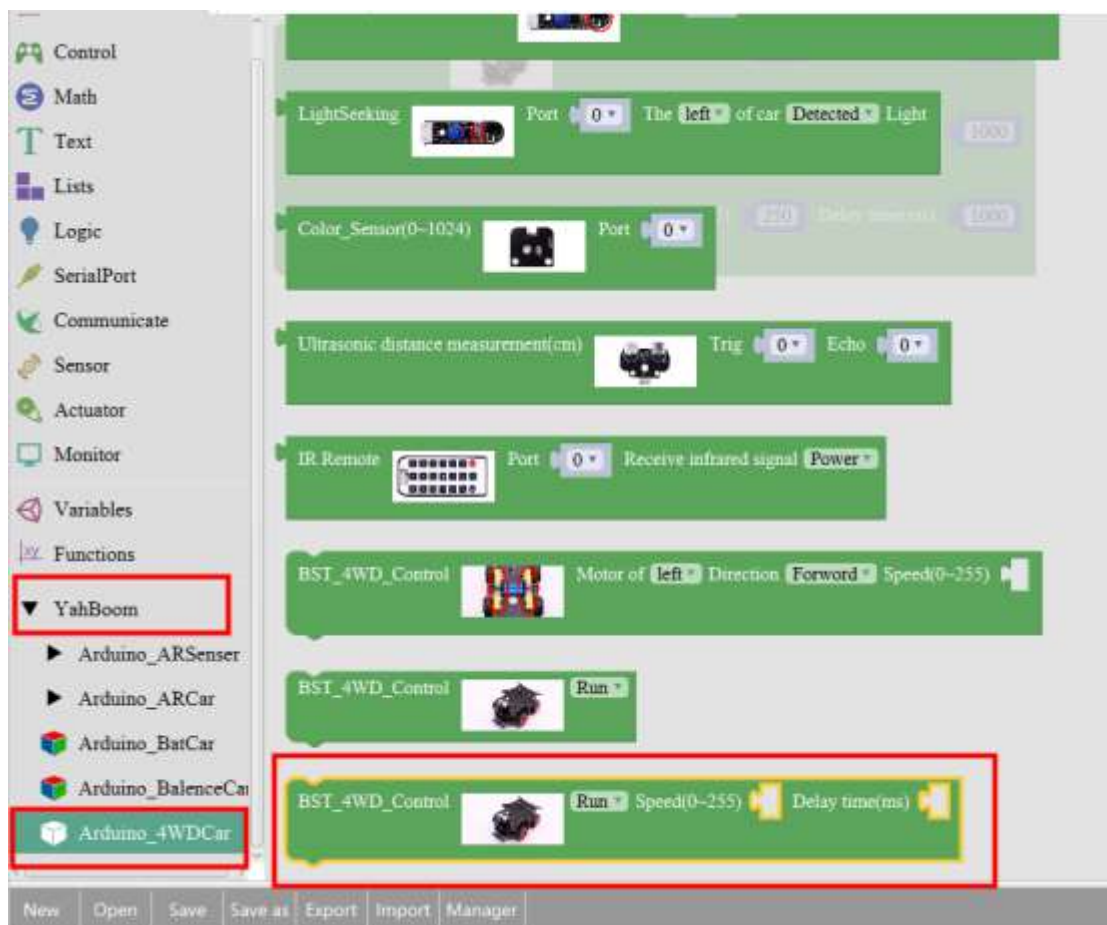
c、After configured,select the upload button above the picture, wait for the following box prompt the upload successfully. Debugging infrared probe, infrared obstacle avoidance can be regulated by rotating potentiometer sensitivity distance, and then adjust the distance according to the speed, thus preventing too quickly hit the car following, in the following areas, turn on the power, placed in front of the car to follow, to see whether the car with the obstacles ahead.

12- Seek light

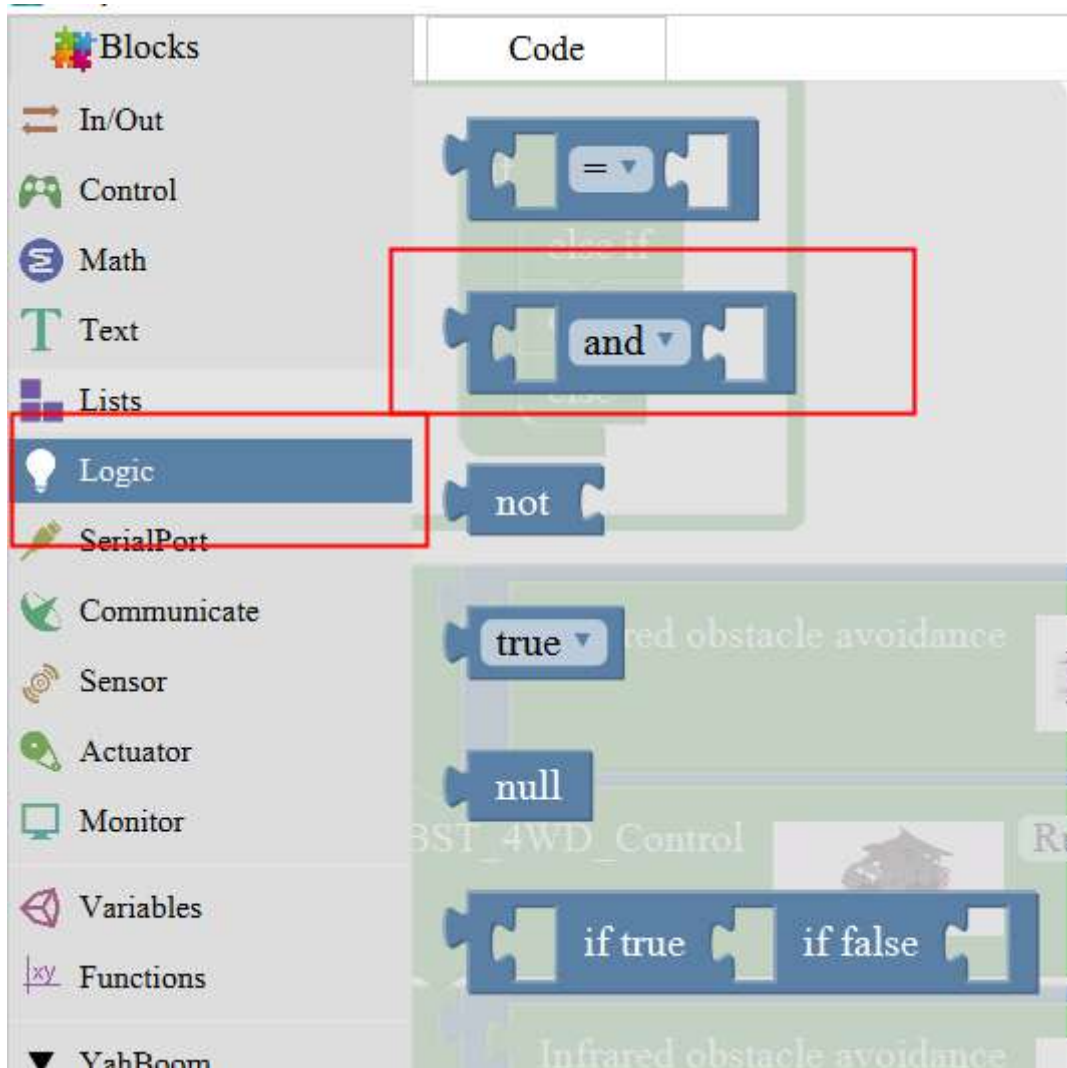
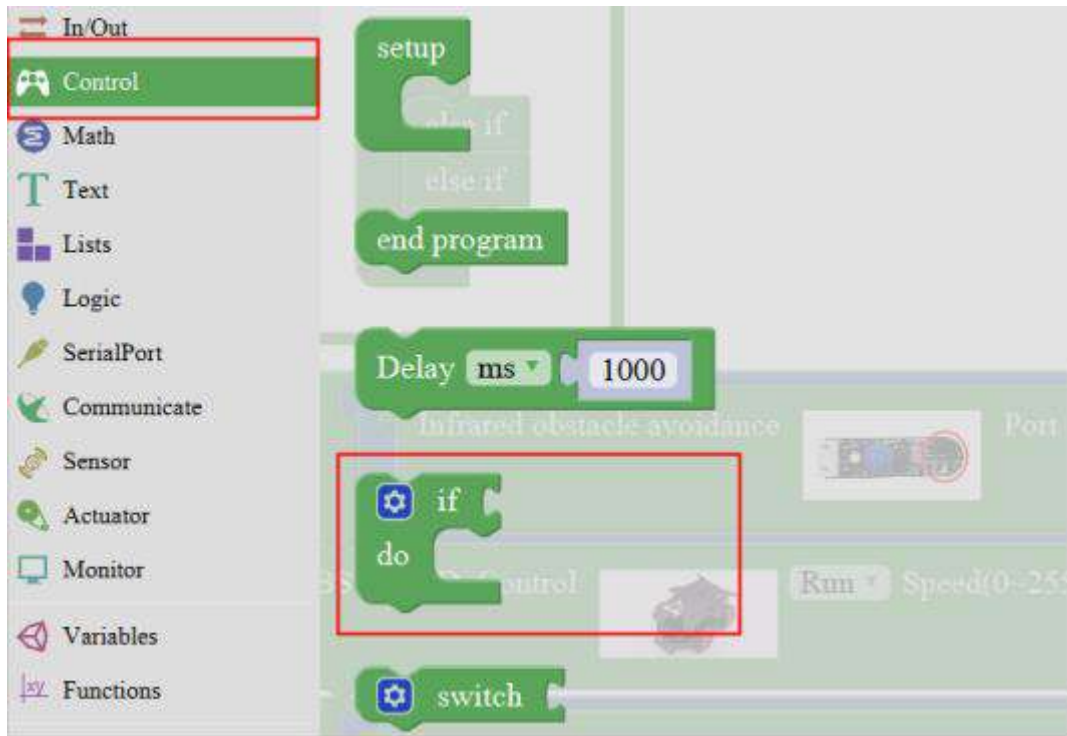
Follow the steps to splice the building blocks :



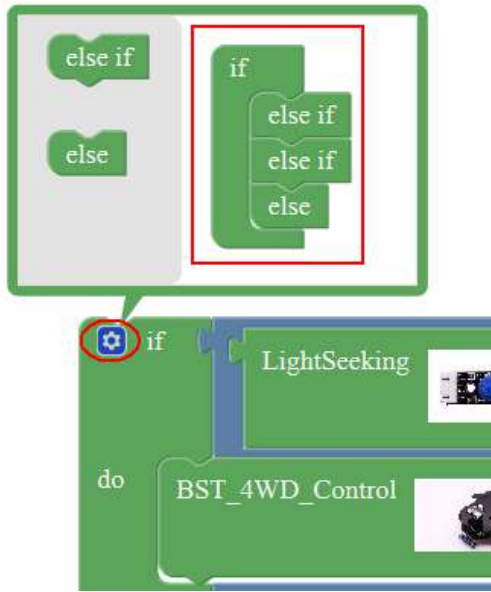
1、 Experimental building blocks :







Note:

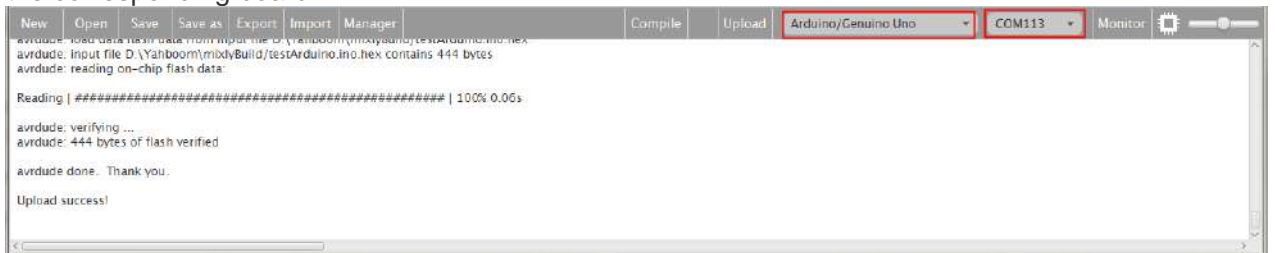


2、Experimental verification :



a、After splicing, select the compile button above the picture, wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

b、After compiled , select **Arduino/Genuino Uno** follow the picture, selects the serial number of the corresponding board.



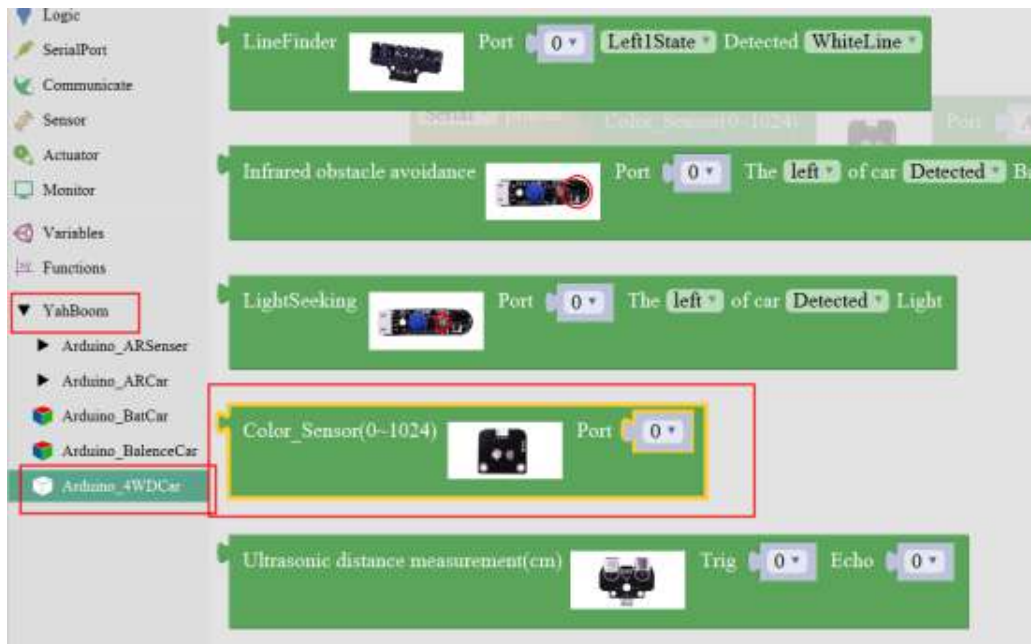
c、After configured,select the upload button above the picture, wait for the following box prompt the upload successfully. Debugging search light sensor, when exposure to the light source, the light source light is off, no radiation lit, and then power on, the car on the open ground, with a flashlight to find the light module on the left and right sides, to see whether the car with light walking.

13- Color sensor

Follow the steps to splice the building blocks :



1、 Experimental building blocks :



2、Experimental verification :



a、After splicing, select the compile button above the picture, wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

b、After compiled , select **Arduino/Genuino Uno** follow the picture, selects the serial number of the corresponding board.

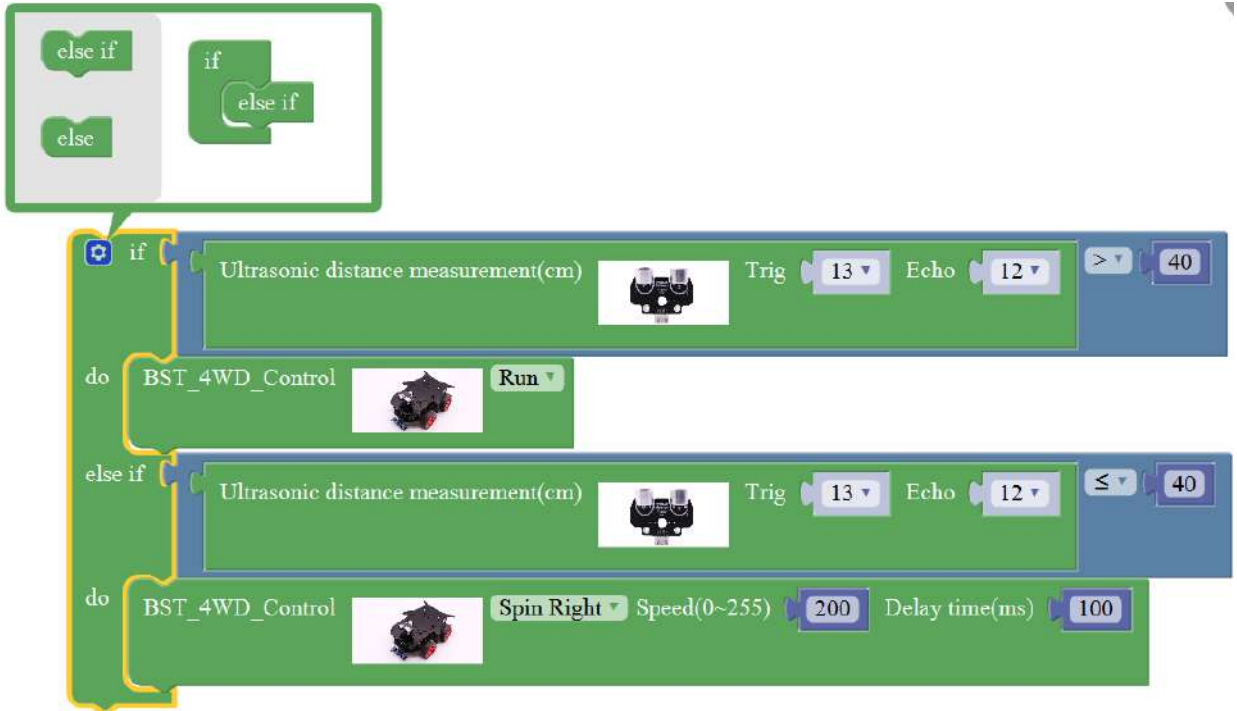


c、After configured,select the upload button above the picture, wait for the following box prompt the upload successfully.Open the serial monitor as follows , check whether to print the values, change the colors, and check if the values change.

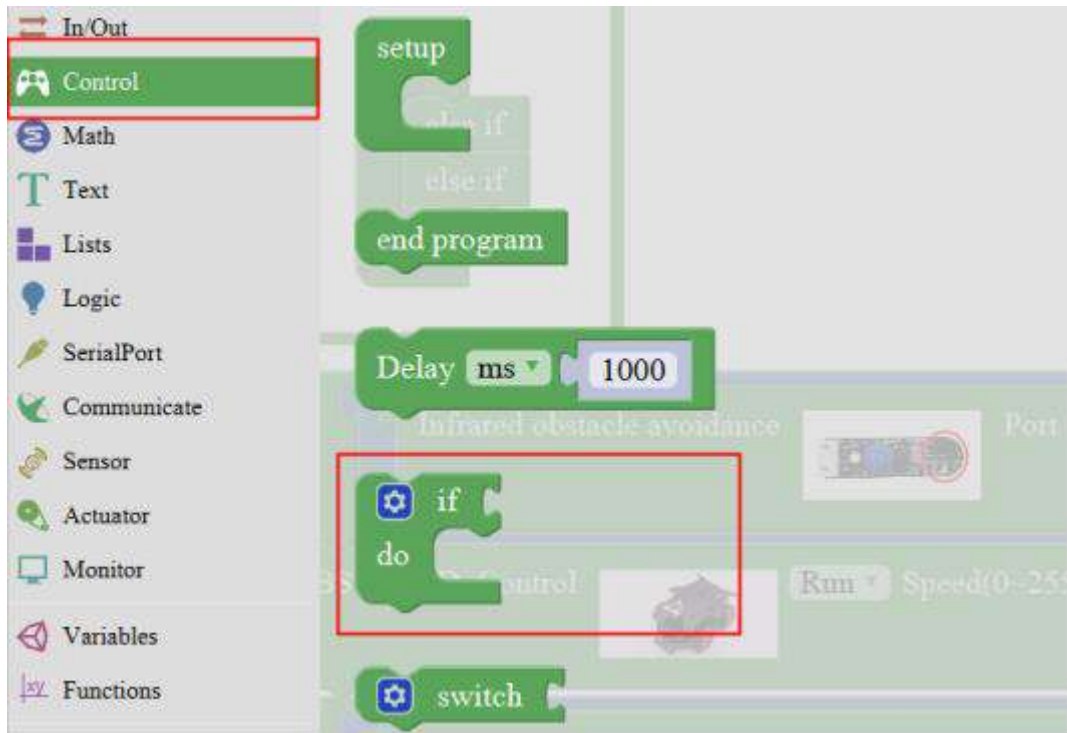


14- Ultrasonic obstacle avoidance

Follow the steps to splice the building blocks :



1、Experimental building blocks :

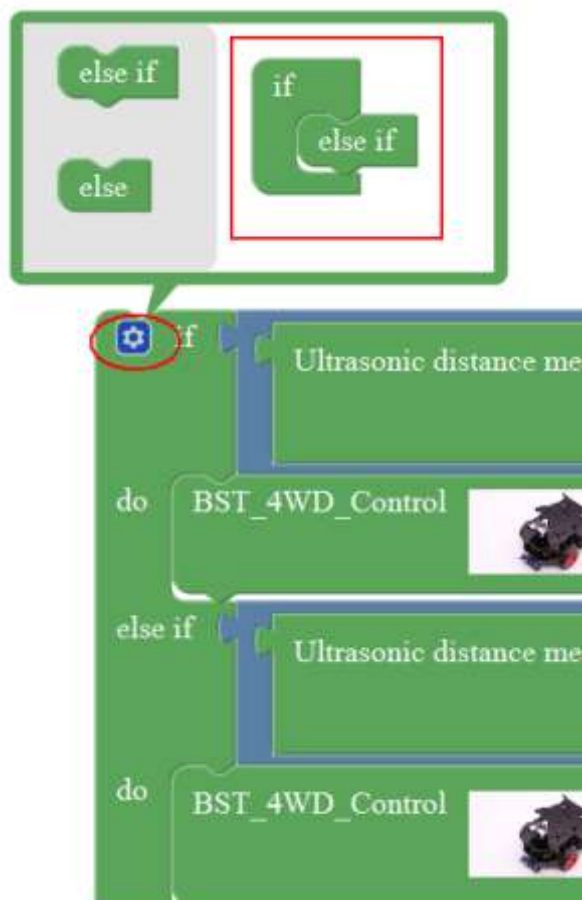


The image shows the Scratch interface with the 'Logic' category selected in the 'Blocks' palette. The 'Code' workspace contains several logic blocks: an equals sign (=) block, an 'and' block, a 'not' block, a 'true' block, a 'null' block, and an 'if true / if false' block. A red box highlights the 'Logic' category in the palette and the equals sign block in the workspace.

The image shows the Scratch interface with the 'Math' category selected in the 'Blocks' palette. The 'Code' workspace contains several math blocks: a '1' block, an addition (+) block with '1' and '1', a multiplication (&) block with '0' and '0', a 'sin' block, a 'Round' block, a 'max' block with '1' and '2', a 'random seed' block, and a 'random integer from' block with '1' and '100'. A red box highlights the 'Math' category in the palette and the '1' block in the workspace.



Note:

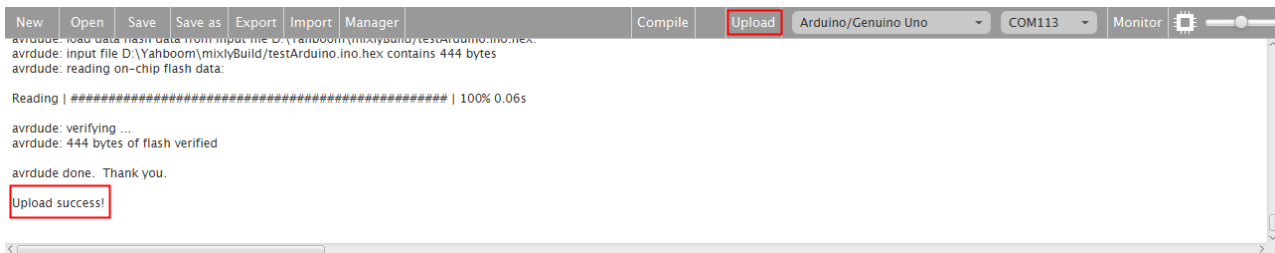
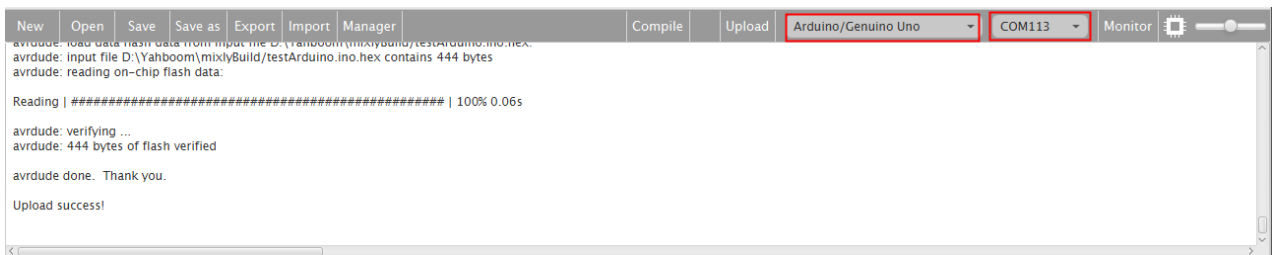


2、Experimental verification :



a、 After splicing, select the compile button above the picture, wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

b、 After compiled , select **Arduino/Genuino Uno** follow the picture, selects the serial number of the corresponding board.



c、 After configured,select the upload button above the picture, wait for the following box prompt the upload successfully. The car is placed in the obstacle avoidance area, turn on the power, the car forward, obstacle distance is less than or equal to 40cm, the car still continue testing, right for a while, the distance is greater than 40cm, the car has always been ahead, waiting for a distance of less than 40cm, continue the previous steps.

15- Ultrasonic obstacle avoidance with Servo pan

Follow the steps to splice the building blocks :

```

    Cloud Platform
    Post # 3
    Degree (0-180) 90
    Delay(ms) 200

    Ultrasonic distance measurement(cm) Trig 13 Echo 12

    if (len > 30 and len < 430)
    do
        BST_4WD_Control Run
    else
        BST_4WD_Control Back Speed(0-255) 220 Delay time(ms) 100
        BST_4WD_Control Stop

    Cloud Platform
    Post # 3
    Degree (0-180) 0
    Delay(ms) 500

    right Ultrasonic distance measurement(cm) Trig 13 Echo 12

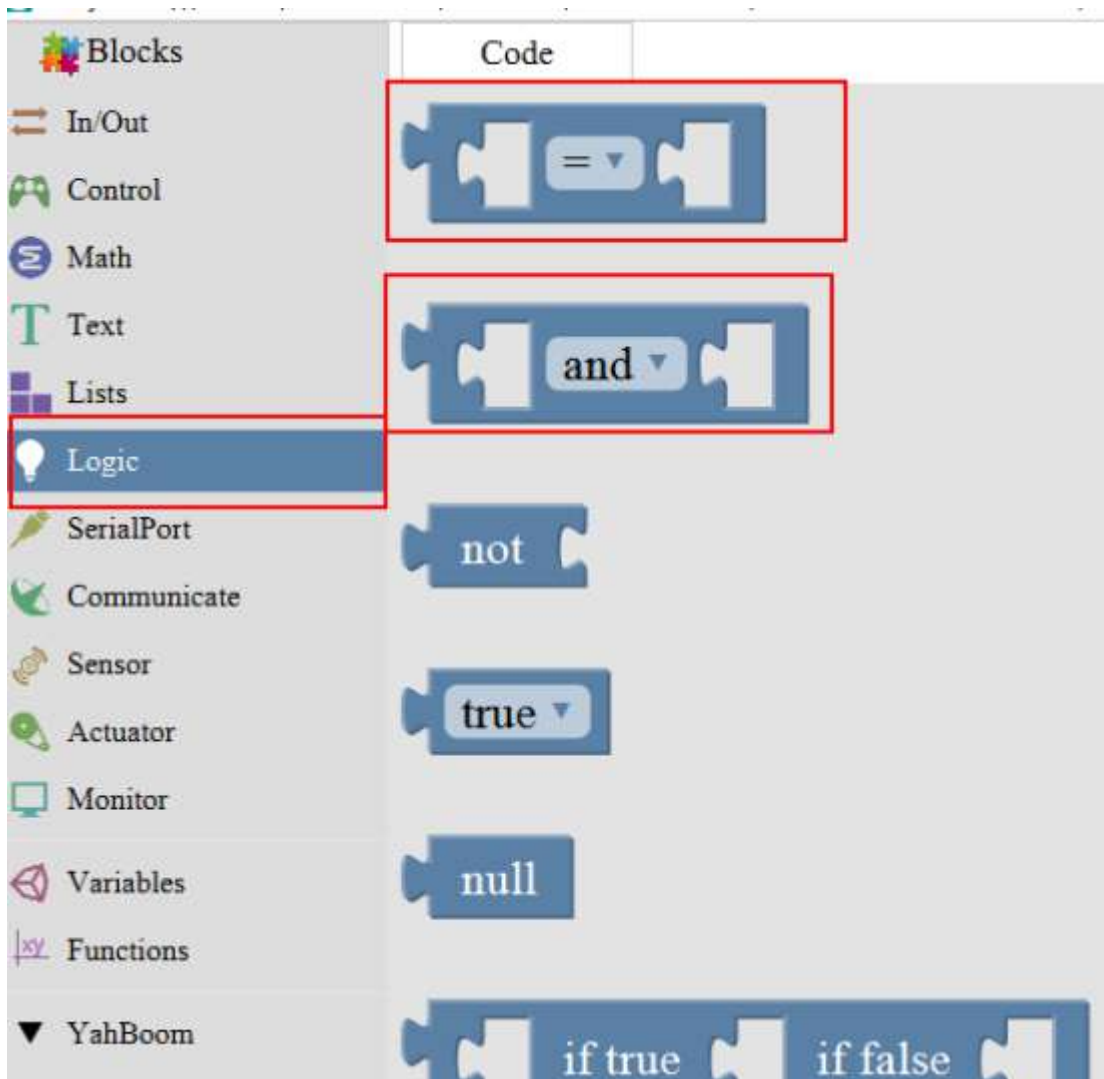
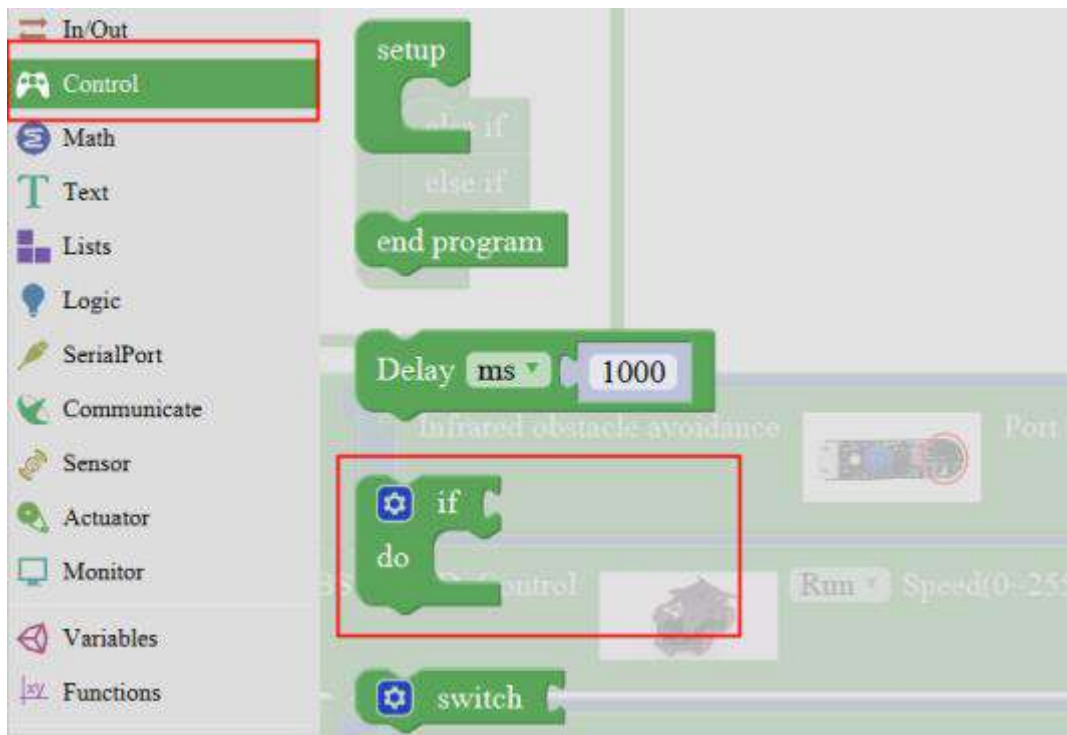
    Cloud Platform
    Post # 3
    Degree (0-180) 180
    Delay(ms) 500

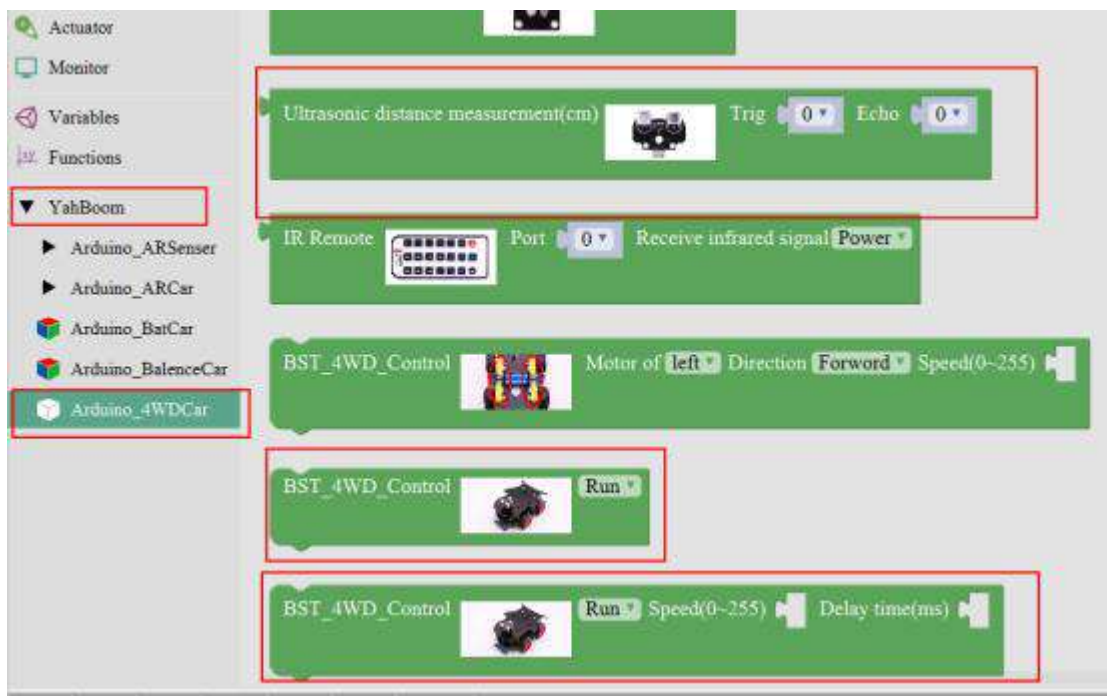
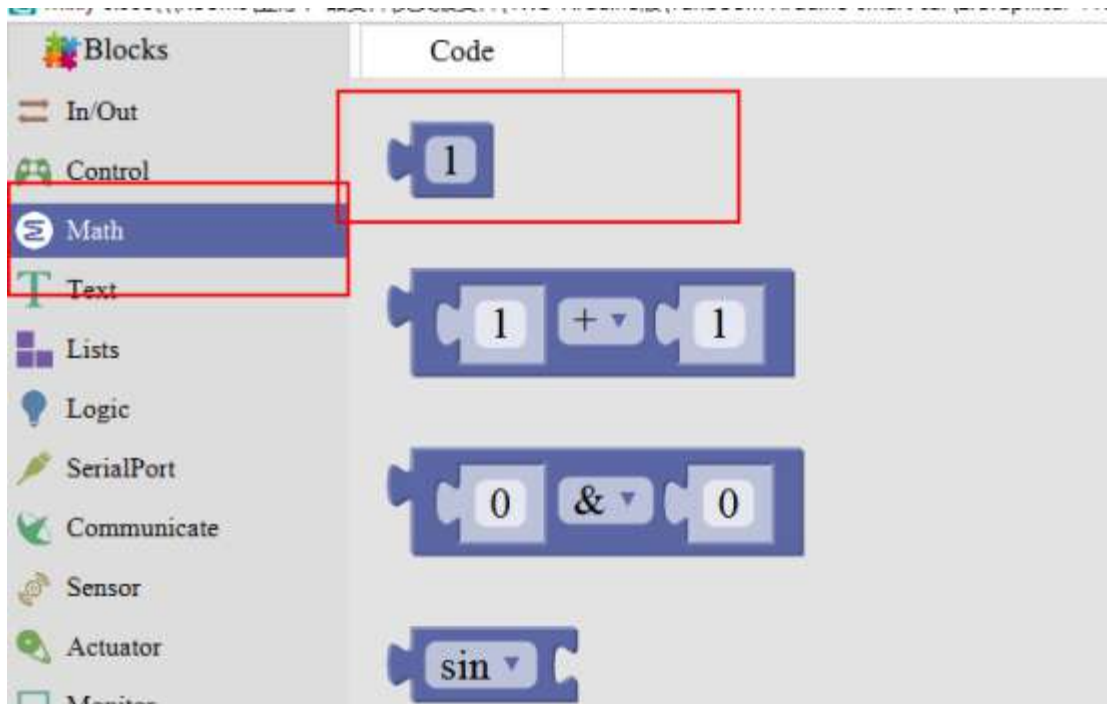
    left Ultrasonic distance measurement(cm) Trig 13 Echo 12

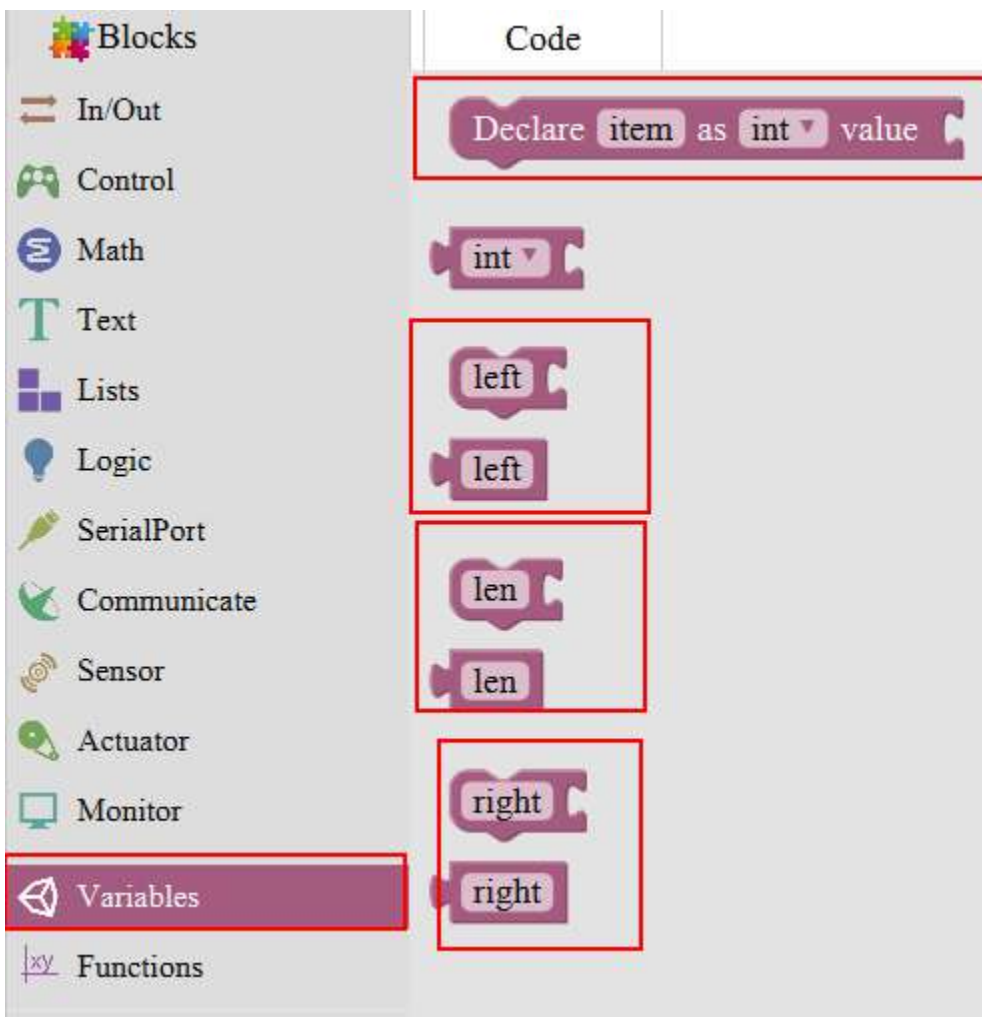
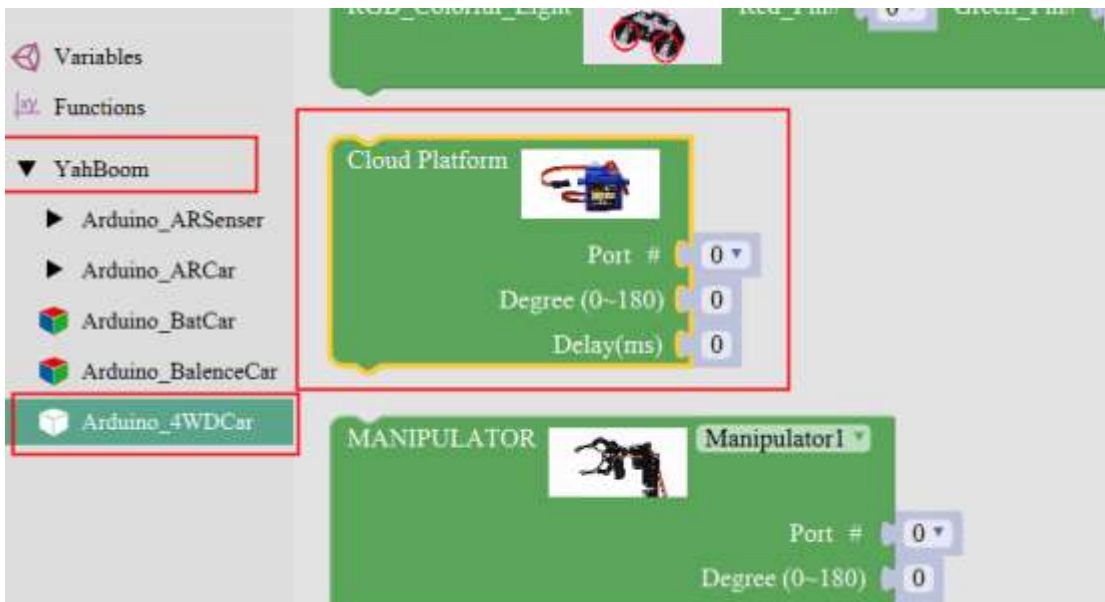
    Cloud Platform
    Post # 3
    Degree (0-180) 90
    Delay(ms) 500

    if (left < 20 and right < 20)
    do
        BST_4WD_Control Spin Right Speed(0-255) 220 Delay time(ms) 400
    else if (left > right)
    do
        BST_4WD_Control Spin Left Speed(0-255) 220 Delay time(ms) 100
    else if (left < right)
    do
        BST_4WD_Control Spin Right Speed(0-255) 220 Delay time(ms) 100
  
```

1、 Experimental building blocks :





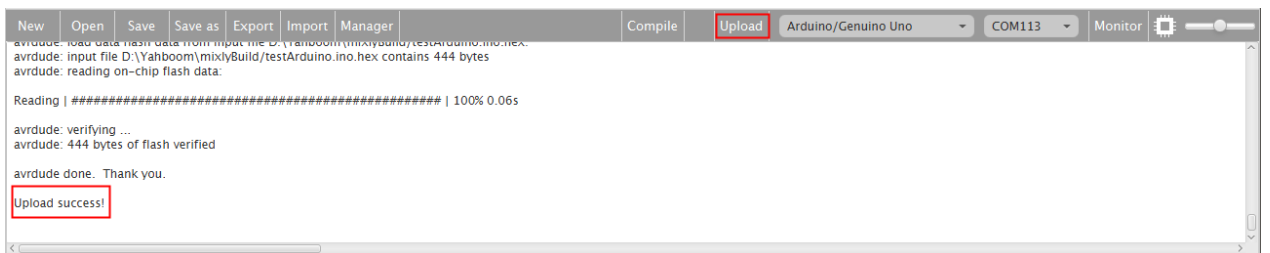
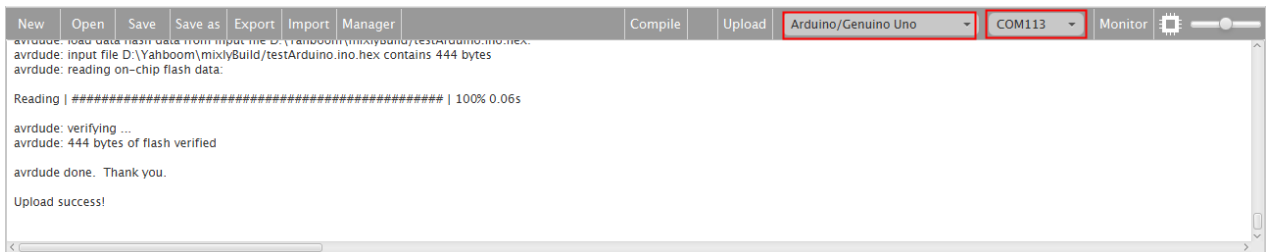


2、 Experimental verification :



a、 After splicing, select the compile button above the picture, wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

b、 After compiled , select **Arduino/Genuino Uno** follow the picture, selects the serial number of the corresponding board.



c、 After configured,select the upload button above the picture, wait for the following box prompt the upload successfully.The car is placed in the obstacle avoidance area, turn on the power, the car forward, obstacle distance is greater than 30 and less than 450 straight, stop the car less than or equal to 30, and the left rudder left shaking measuring distance, measuring roll right right distance judgments about distance, about less than 20 turn, the left and right distance who is to either side, continue to repeat the obstacle avoidance.

16- Infrared remote control

Follow the steps to splice the building blocks :

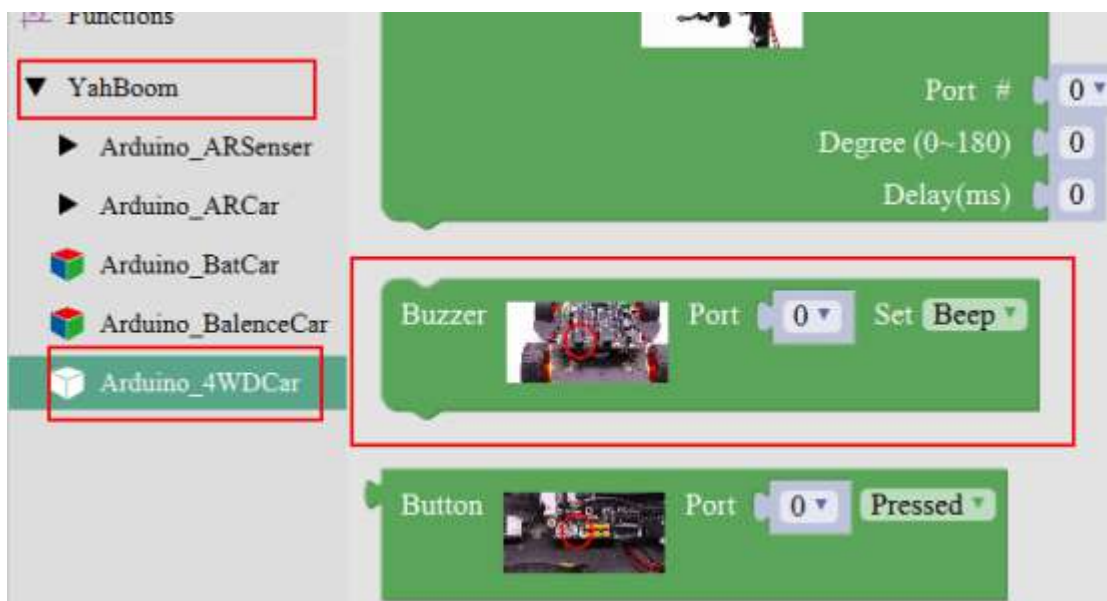
The image shows a Scratch script for controlling an RGB light and a buzzer via an IR remote. The script is structured as follows:

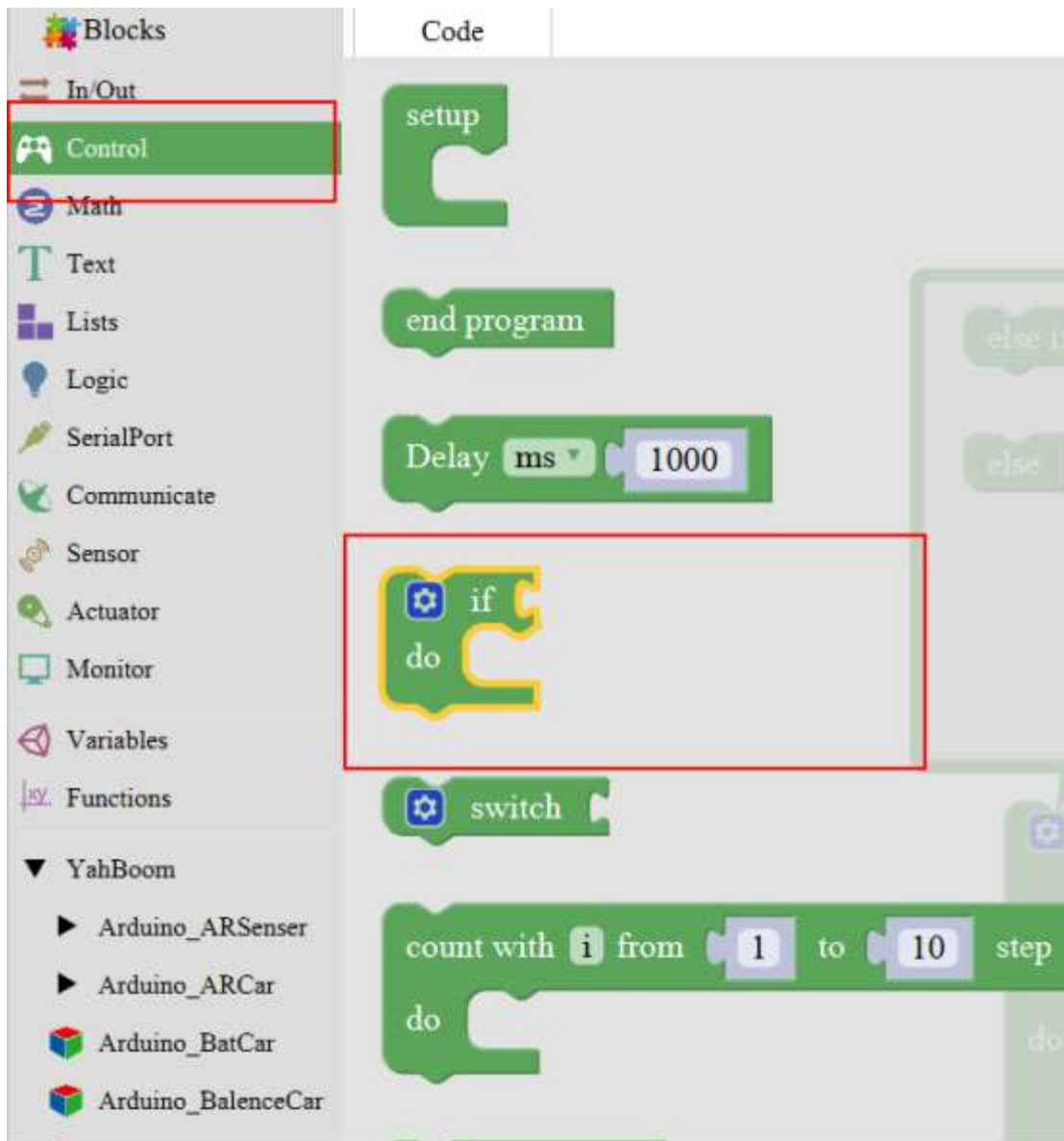
- if** IR Remote (Port: A5) Receive infrared signal **Power**
 - do** RGB_Colorful_Light (Red_Pin#: 11, Green_Pin#: 10, Blue_Pin#: 9) Stat: **RED**
- else if** IR Remote (Port: A5) Receive infrared signal **LED**
 - do** RGB_Colorful_Light (Red_Pin#: 11, Green_Pin#: 10, Blue_Pin#: 9) Stat: **SOLFERINO**
- else if** IR Remote (Port: A5) Receive infrared signal **Beep**
 - do** Buzzer (Port: A0) Set: **Beep**
 - Delay (ms): **1000**
 - Buzzer (Port: A0) Set: **No Beep**

1、Experimental building blocks :

The image shows the Scratch Functions palette with the following experimental building blocks highlighted with red boxes:

- YahBoom**
 - Arduino_ARSensor
 - Arduino_ARCar
 - Arduino_BatCar
 - Arduino_BalanceCar
 - Arduino_4WDCar**
- IR Remote** (Port: 0) Receive infrared signal **Power**
- BST_4WD_Control** (Motor of: left, Direction: Forward, Speed: 0-100)
- BST_4WD_Control** (Run)



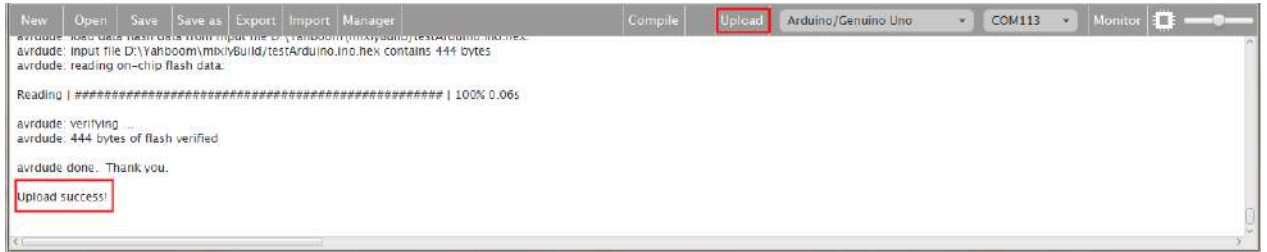
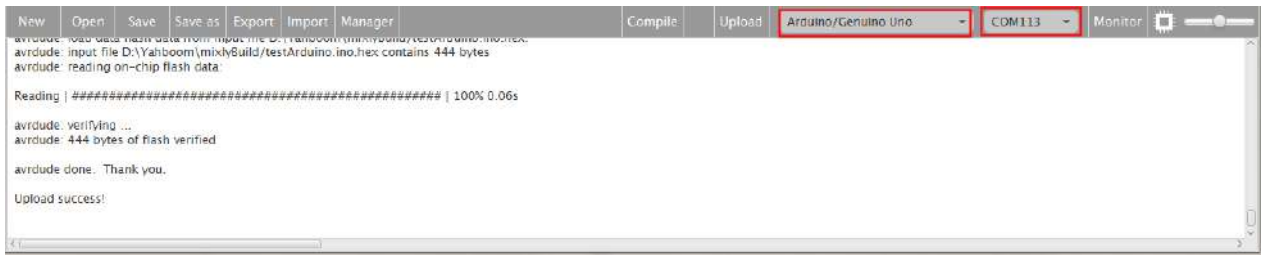


2、Experimental verification :



a、 After splicing, select the compile button above the picture, wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

b、 After compiled , select **Arduino/Genuino Uno** follow the picture, selects the serial number of the corresponding board.



c、 After configured,select the upload button above the picture, wait for the following box prompt the upload successfully.If the red power button is pressed, the red light will start; press the white light button, the car is bright red; press the horn key, and the car will whistle for one second.



telecontroller