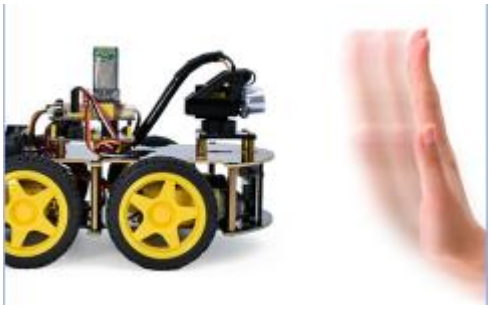
Project 12 Ultrasonic Following Smart Car



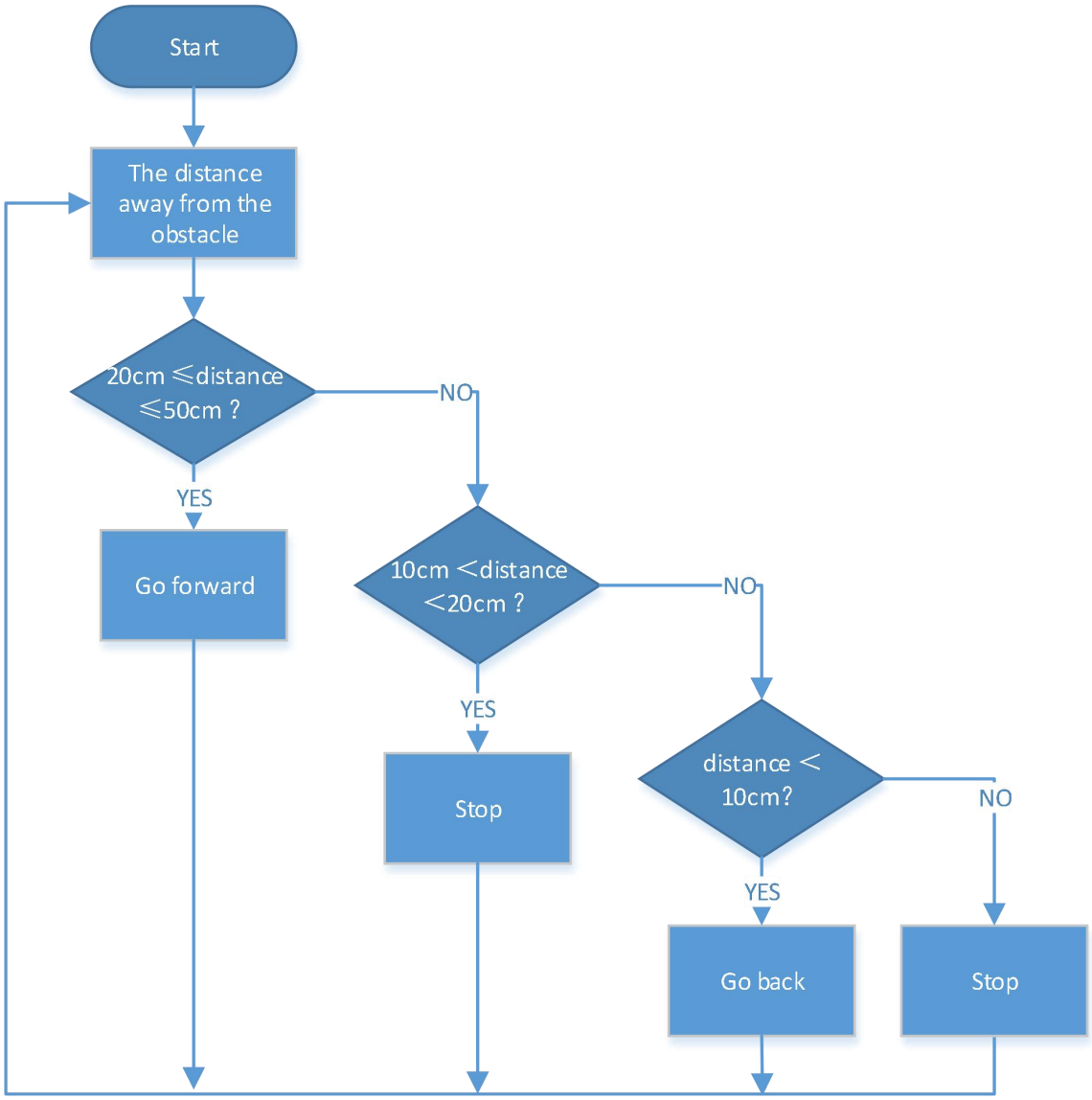
1.Description

In this project, we will look to detect the distance between the 4WD smart car and the obstacles ahead through an ultrasonic sensor to drive two motors in a way that make the car move and make the 8*8 LED board show a smile facial pattern.

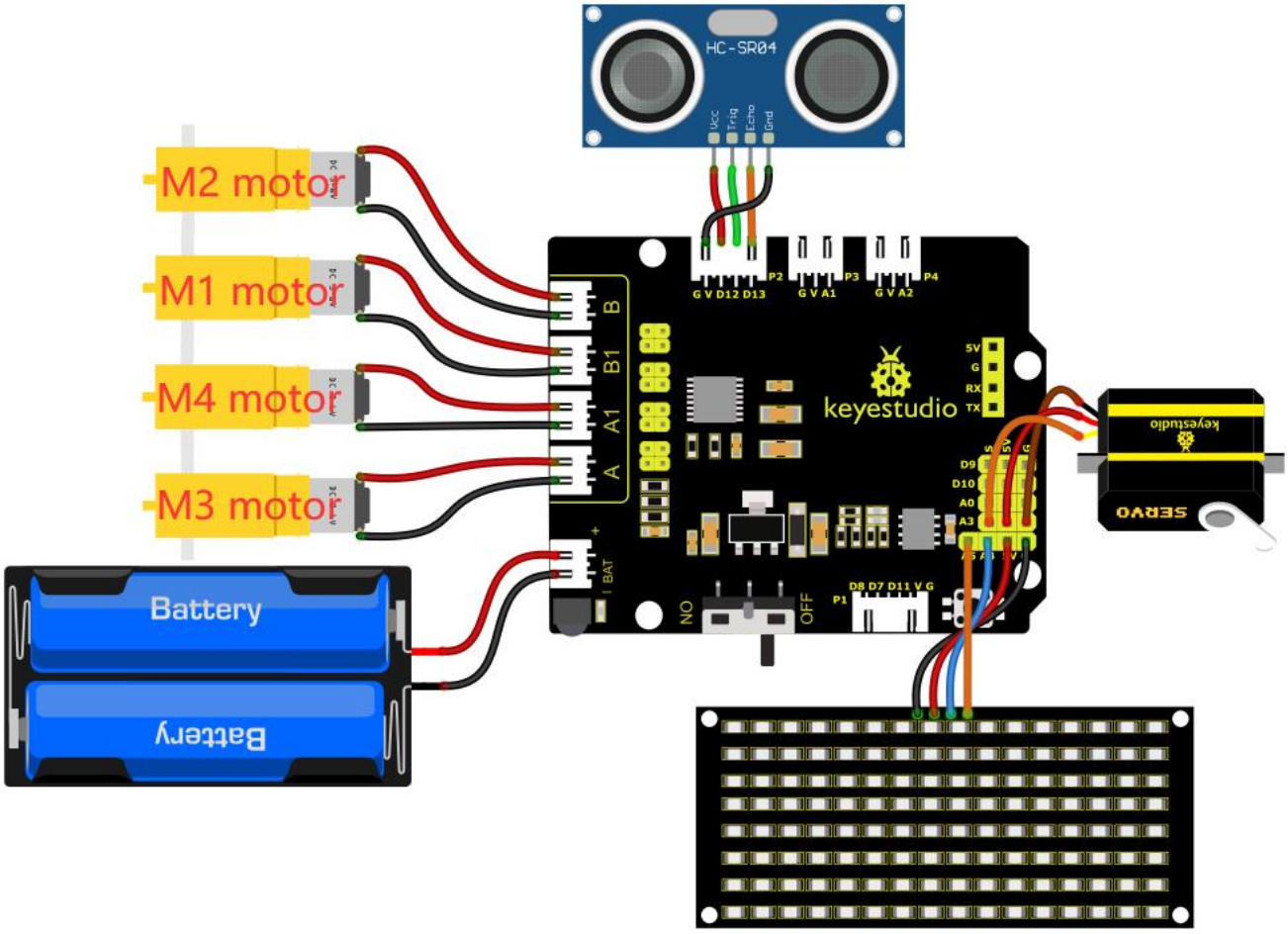
2.Flow Chart

Detection	Measured distance of front obstacles	distance (unit: cm)
Setting	8*16 LED board shows a smile pattern.	
	Set servo to 90°	
Condition	distance≥20 and distance≤50	
Status	Go forward	
Condition	distance > 10 and distance < 20	
	distance > 50	
Condition	stop	

Condition	distance≤10
Condition	Go back



3.Wiring Diagram



Wiring up:

1. GND, VCC, SDA and SCL of the 8*8 LED board are connected to G (GND), V (VCC), A4 and A5 of the expansion board.

2. VCC, Trig, Echo and Gnd of the ultrasonic sensor are connected to 5V(V), D12(S), D13(S) and Gnd(G)

3. The servo is connected to G, V and A3. The brown wire is interfaced

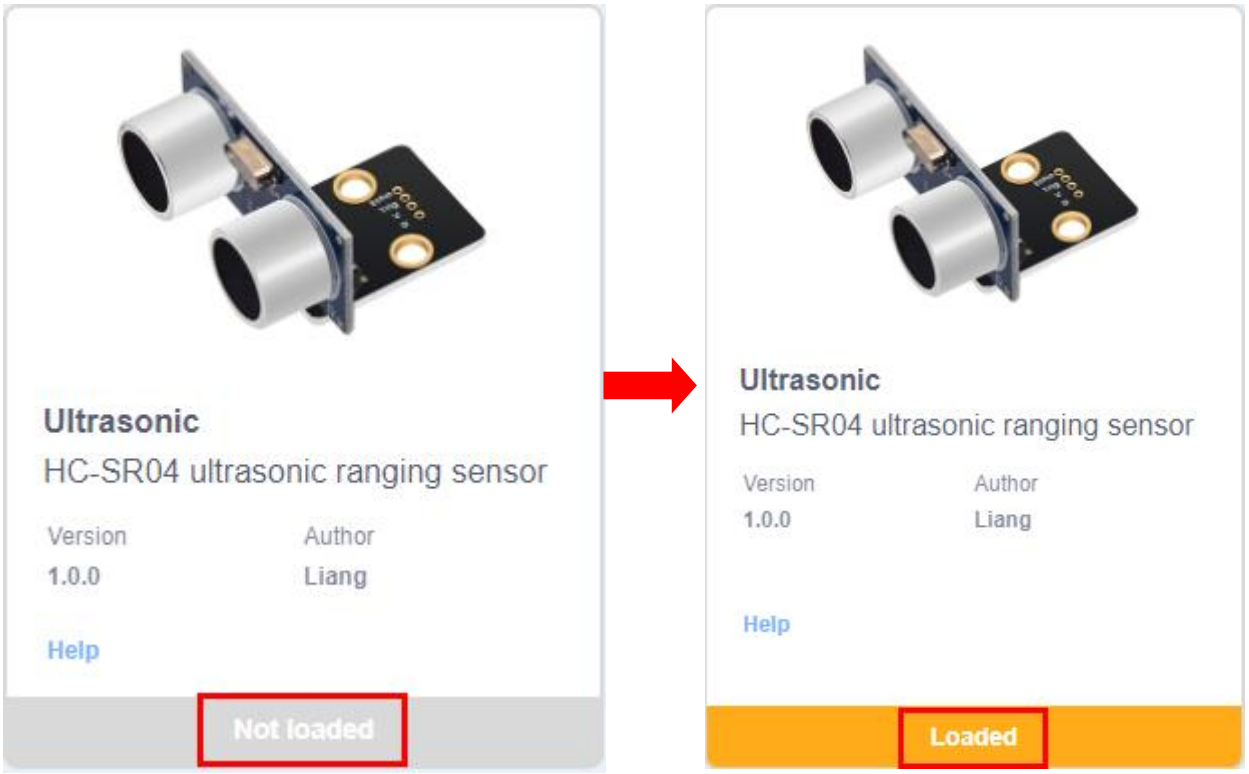
with Gnd(G), the red wire is interfaced with 5V(V) and the orange wire is interfaced with A3.

4. The power is connected to the BAT port

4.Test Code

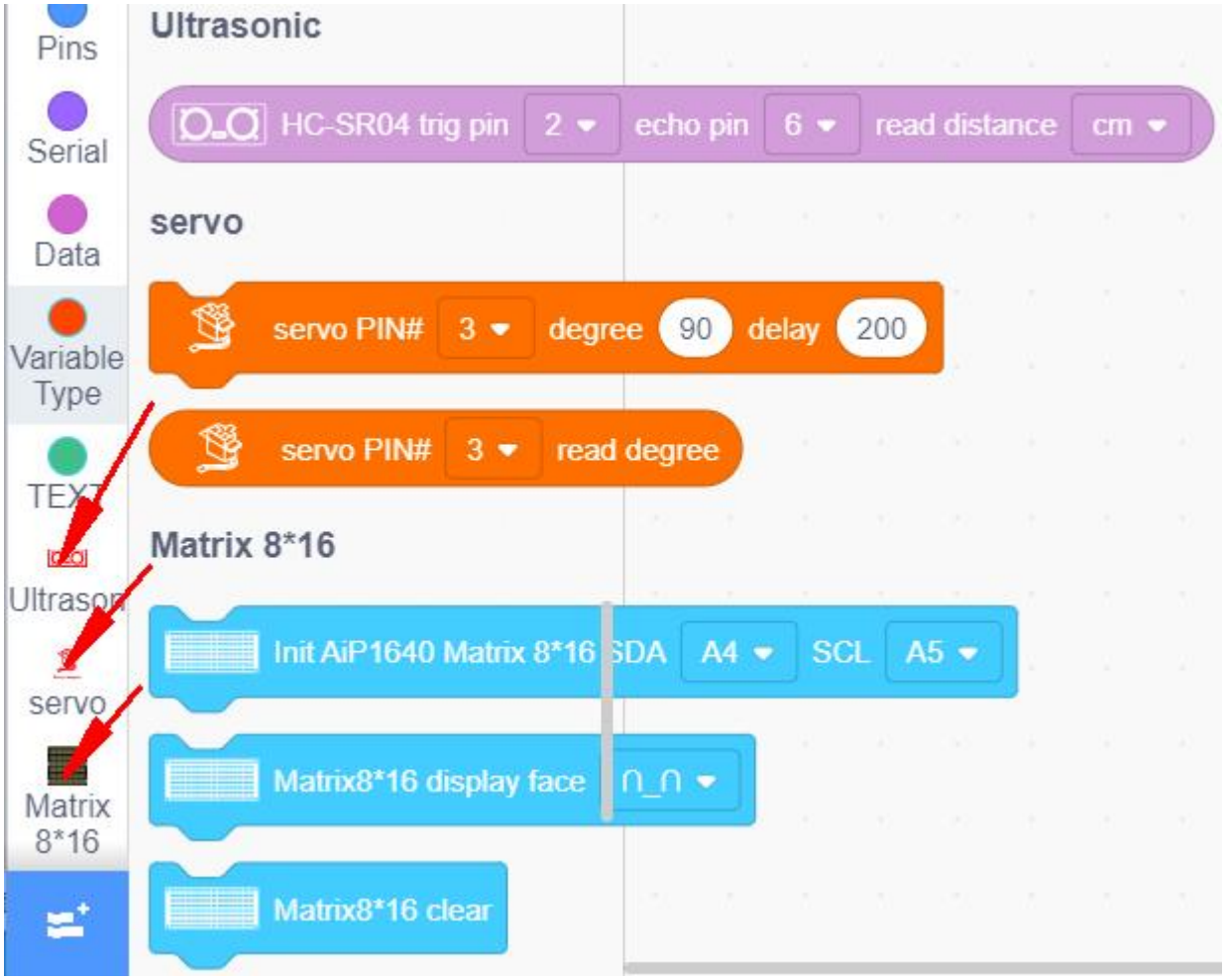
Before writing the code, it is necessary to import the library files of the ultrasonic sensor, 8x16 LED board and the servo. The specific steps are as follows:

Click  to enter the extension library interface of sensors/modules/components, then search for " Ultrasonic " sensor  and click it. In this way, "Not loaded" changes to "loaded", indicating that the "Ultrasonic" sensor was added successfully.



The 8x16 LED board and servo library files are added in the same way as the ultrasonic sensor.

Click Back to return to the code editor interface, the instruction block of the added "Ultrasonic" sensor, "Matrix 8*16" module and "Servo" component can be seen in the module area.

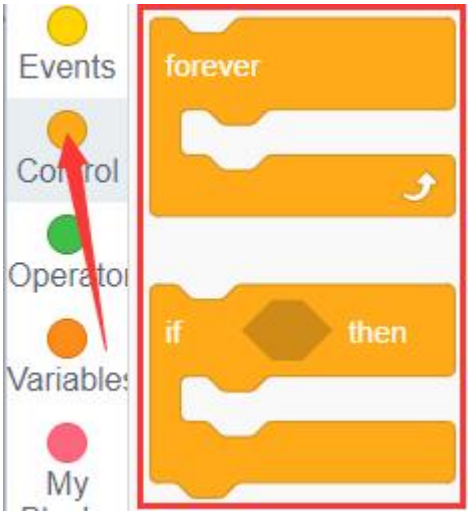


You can drag blocks to edit. Blocks listed below are for your reference

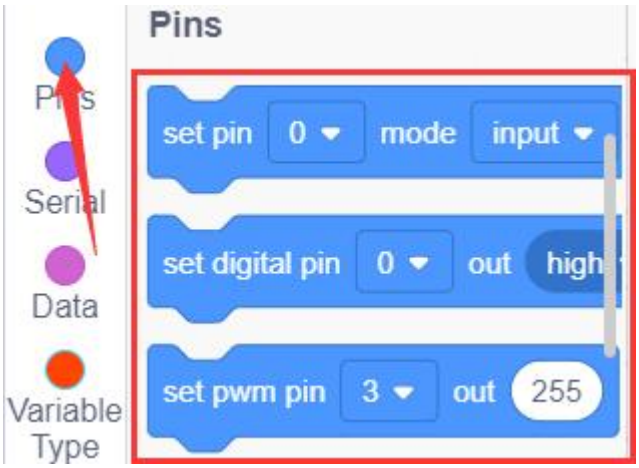
（1）



（2）


Events
Control
Operator
Variables
My
forever
if
then

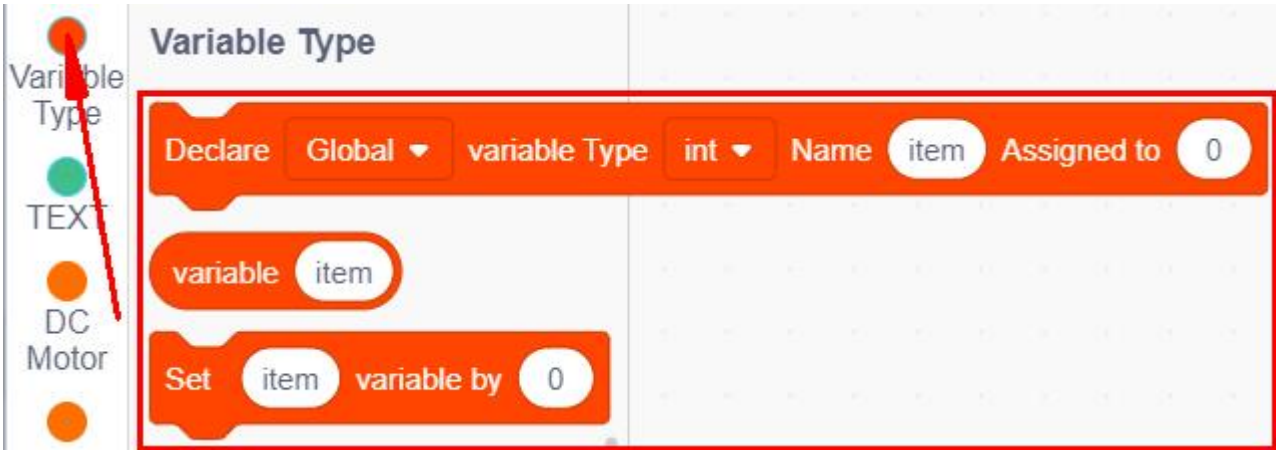
（3）


Pins
Serial
Data
Variable
Type
Pins
set pin 0 mode input
set digital pin 0 out high
set pwm pin 3 out 255

（4）


Serial
Data
Variable
Type
Serial
serial begin baudrate 9600
serial print Hello KidsBlock

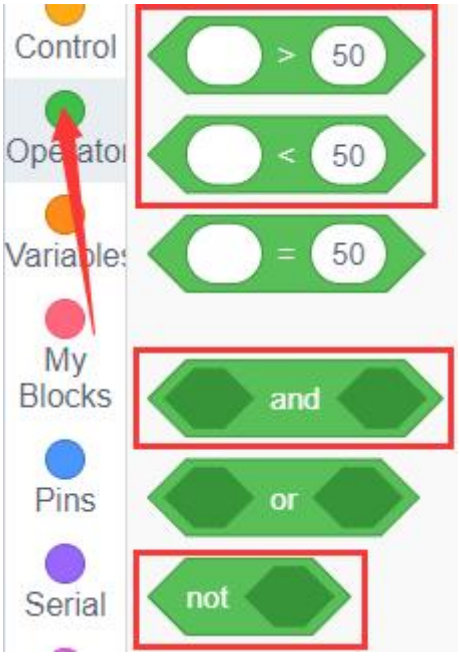
（5）


Variable Type
TEXT
DC Motor
Variable Type
Declare Global variable Type int Name item Assigned to 0
variable item
Set item variable by 0

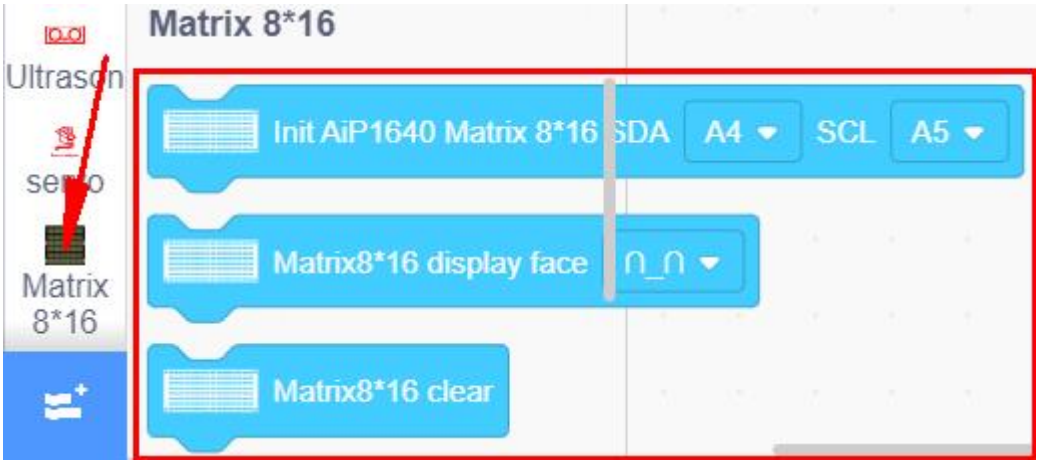
（6）


Matrix
servo
servo PIN# 3 degree 90 delay 200

（7）


Control
Operator
Variables
My Blocks
Pins
Serial
> 50
< 50
= 50
and
or
not

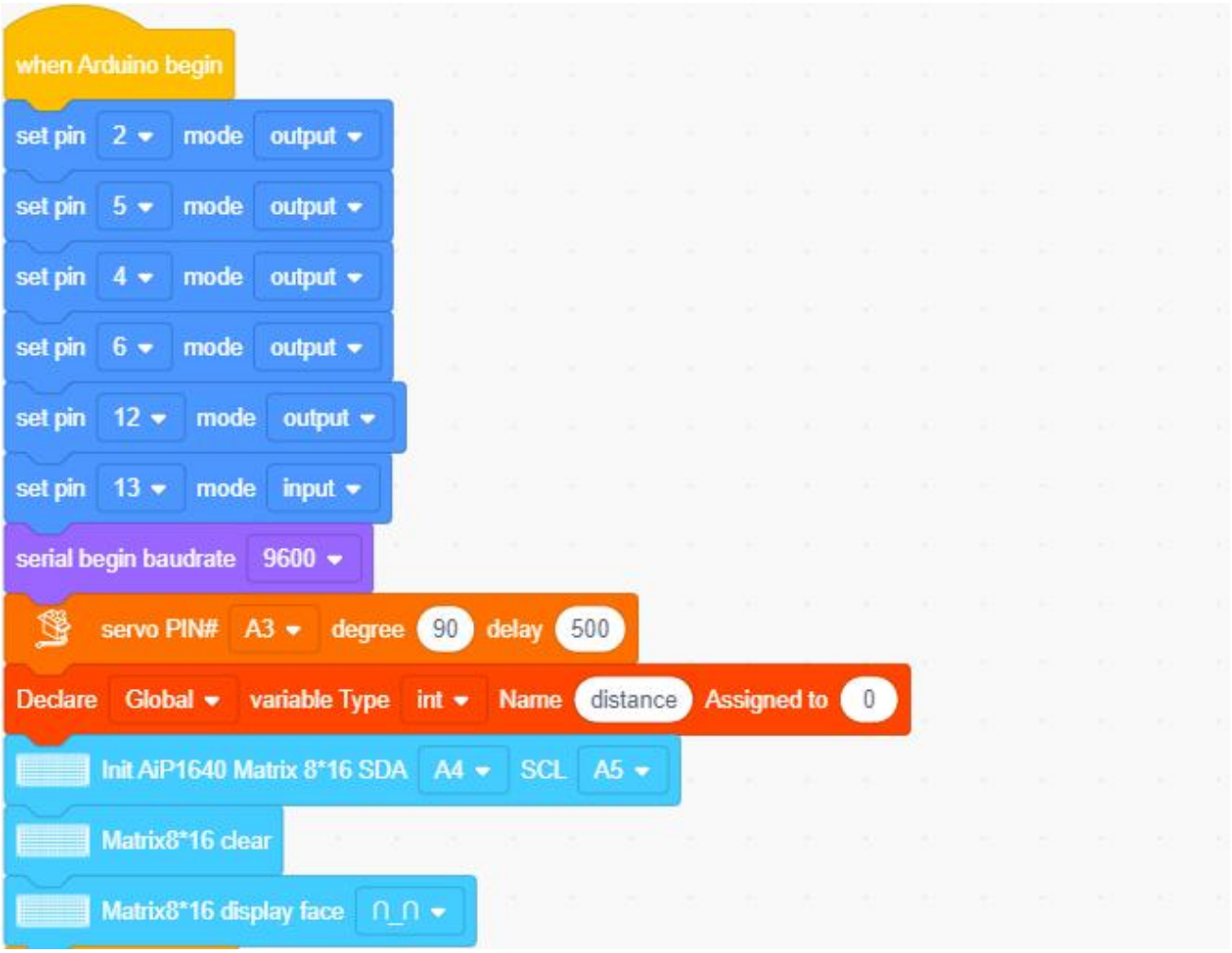
（8）

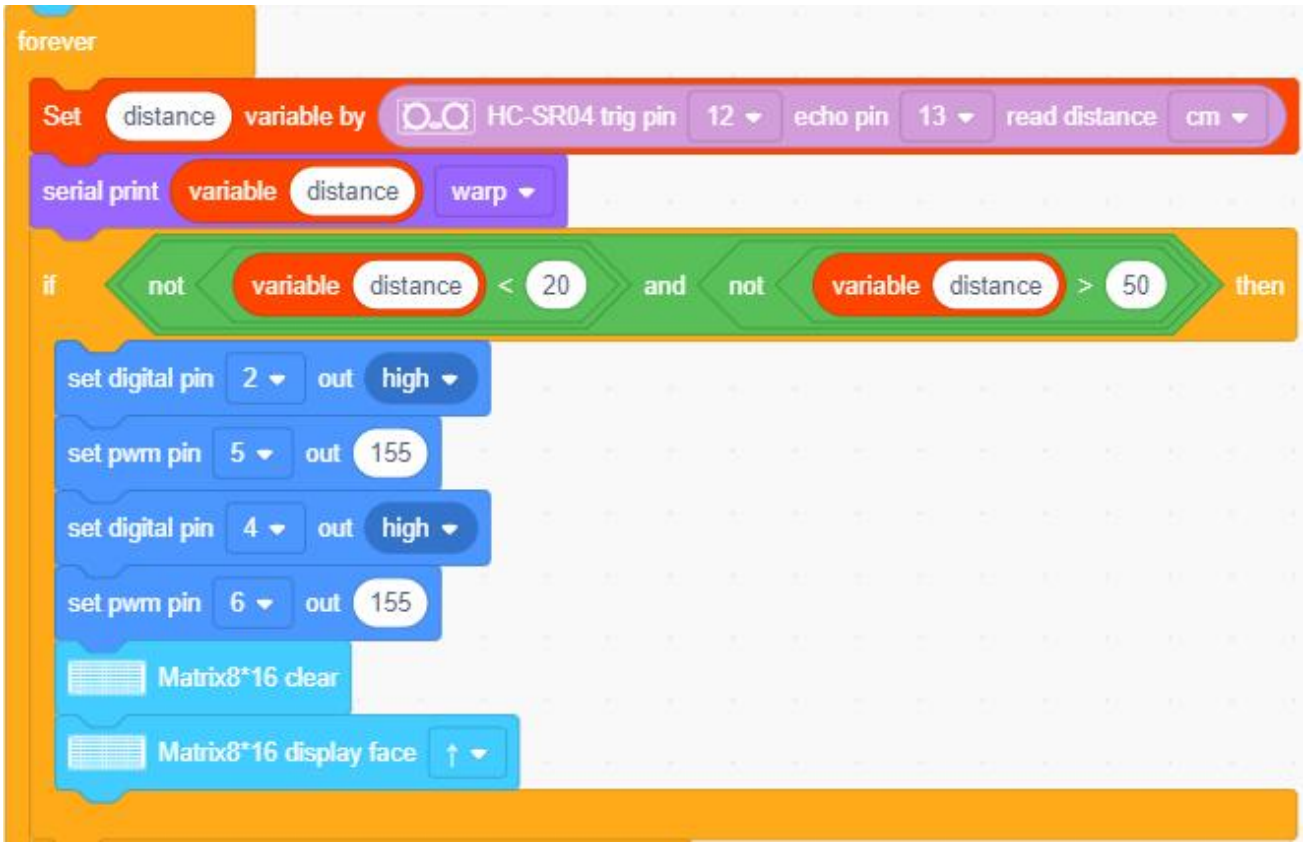

Ultrason
servo
Matrix 8*16
Matrix 8*16
Init AiP1640 Matrix 8*16 SDA A4 SCL A5
Matrix8*16 display face ∩_∩
Matrix8*16 clear

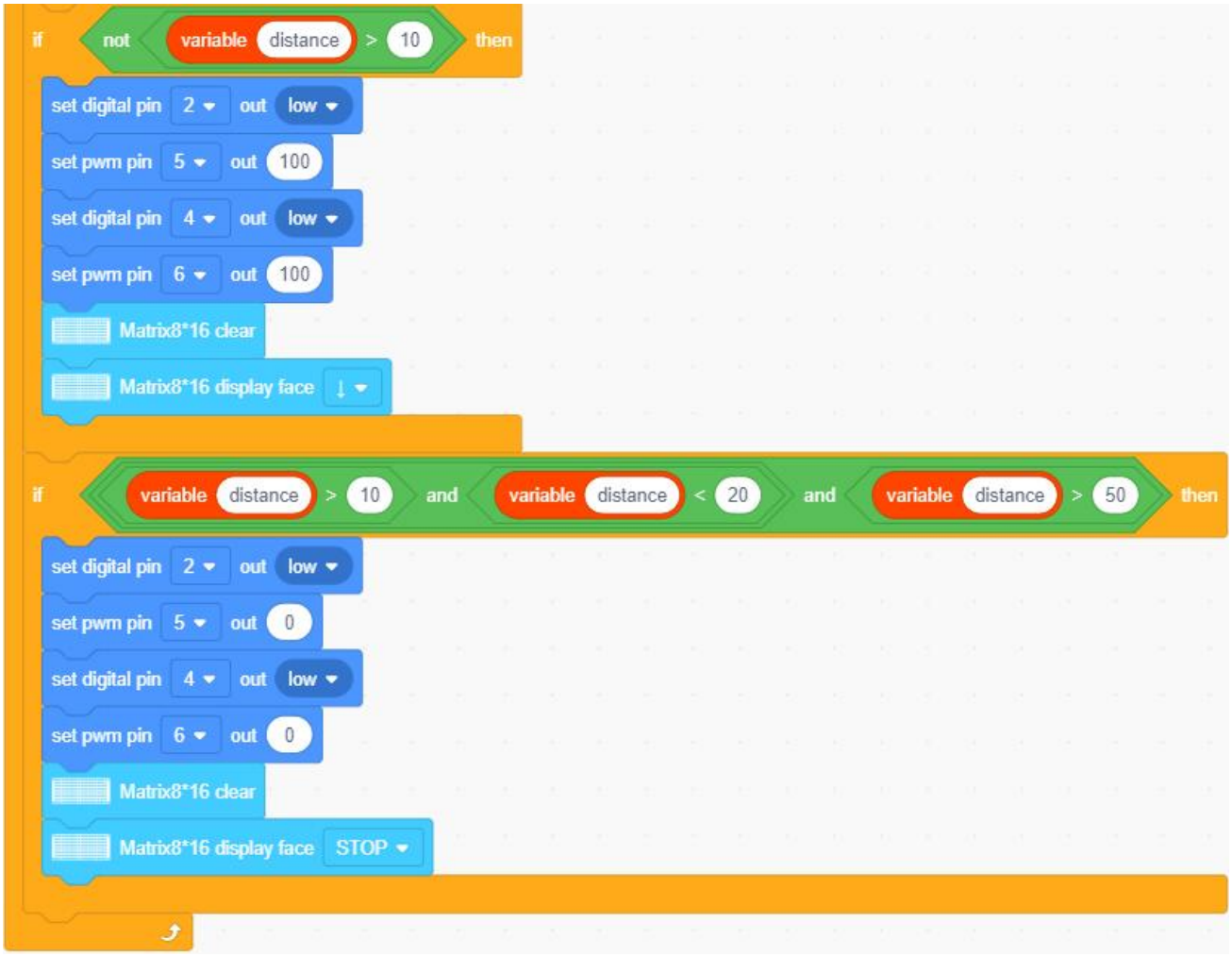
（9）



Complete Test Code




forever
Set distance variable by HC-SR04 trig pin 12 echo pin 13 read distance cm
serial print variable distance warp
if not variable distance < 20 and not variable distance > 50 then
set digital pin 2 out high
set pwm pin 5 out 155
set digital pin 4 out high
set pwm pin 6 out 155
Matrix8*16 clear
Matrix8*16 display face



5.Test Result

After successfully uploading the code to the V4.0 board, connect the wirings according to the wiring diagram, power on the external power then turn the DIP switch to ON. Set the servo to 90°, the smart car will move with the obstacles and the 8X16 LED board will show "smile".