3.ColorfulRun

The purpose of the experiment:

As with the previous experimental project, after uploading the program, turn on the power switch on the back of the smart car and pause for 2 seconds, the smart car starts the specified fancy action.

List of components required for the experiment:

Arduino Smart Car *1

USB cable *1

Experimental code analysis:

```
//==========================yahboom======================
====
//  Intelligent car colorfulrun comprehensive experiment
//============================================================
=====
int Left_motor_back=9;        //(IN1)
int Left_motor_go=5;          //(IN2)
int Right_motor_go=6;         //(IN3)
int Right_motor_back=10;      //(IN4)
void setup()
{
  //Initialize the motor drive IO for output mode
  pinMode(Left_motor_go,OUTPUT); // PIN 5 (PWM)
  pinMode(Left_motor_back,OUTPUT); // PIN 9 (PWM)
  pinMode(Right_motor_go,OUTPUT);// PIN 6 (PWM)
  pinMode(Right_motor_back,OUTPUT);// PIN 10 (PWM)
}
void run(int time)    //car run
{
  digitalWrite(Right_motor_go,HIGH);
```

```
  digitalWrite(Right_motor_back,LOW);
  analogWrite(Right_motor_go,200);//PWM ratio 0~255 speed control,
                    //the difference of left and right wheel slightly increase or
decrease
  analogWrite(Right_motor_back,0);
  digitalWrite(Left_motor_go,HIGH);
  digitalWrite(Left_motor_back,LOW);
  analogWrite(Left_motor_go,200);//PWM ratio 0~255 speed control,
                    //the difference of left and right wheel slightly increase or
decrease
  analogWrite(Left_motor_back,0);
  delay(time * 100);    //execution time, can be adjusted
}
void brake(int time)      //car stop
{
  digitalWrite(Right_motor_go,LOW);
  digitalWrite(Right_motor_back,LOW);
  digitalWrite(Left_motor_go,LOW);
  digitalWrite(Left_motor_back,LOW);
  delay(time * 100);//execution time, can be adjusted
}

void left(int time)         //turn left(left wheel stop，right wheel go)

{
  digitalWrite(Right_motor_go,HIGH);    // right motor go
  digitalWrite(Right_motor_back,LOW);
  analogWrite(Right_motor_go,200);
  analogWrite(Right_motor_back,0);      //PWM ratio 0~255 speed control
  digitalWrite(Left_motor_go,LOW);      //left wheel back
  digitalWrite(Left_motor_back,LOW);
  analogWrite(Left_motor_go,0);
  analogWrite(Left_motor_back,0);       //PWM ratio 0~255 speed control
  delay(time * 100);    //execution time, can be adjusted
}
```

```cpp
void spin_left(int time)        //left rotation(left wheel back，right
wheel go)
{
  digitalWrite(Right_motor_go,HIGH);    // right motor go
  digitalWrite(Right_motor_back,LOW);
  analogWrite(Right_motor_go,200);
  analogWrite(Right_motor_back,0);      //PWM ratio 0~255 speed control
  digitalWrite(Left_motor_go,LOW);      //left wheel back
  digitalWrite(Left_motor_back,HIGH);
  analogWrite(Left_motor_go,0);
  analogWrite(Left_motor_back,200);     //PWM ratio 0~255 speed control
  delay(time * 100);            //execution time, can be adjusted
}
void right(int time)        //turn right(right wheel stop，left wheel go)
{
  digitalWrite(Right_motor_go,LOW);     //right motor back
  digitalWrite(Right_motor_back,LOW);
  analogWrite(Right_motor_go,0);
  analogWrite(Right_motor_back,0);      //PWM ratio 0~255 speed control
  digitalWrite(Left_motor_go,HIGH);     //left motor go
  digitalWrite(Left_motor_back,LOW);
  analogWrite(Left_motor_go,200);
  analogWrite(Left_motor_back,0);       //PWM ratio 0~255 speed control
  delay(time * 100);        //execution time, can be adjusted
}
void spin_right(int time)        // right rotation(right wheel back，left
wheel go)
{
  digitalWrite(Right_motor_go,LOW);    //right motor back
  digitalWrite(Right_motor_back,HIGH);
  analogWrite(Right_motor_go,0);
  analogWrite(Right_motor_back,200);   //PWM ratio 0~255 speed control
```

```cpp
  digitalWrite(Left_motor_go,HIGH);    //left motor go
  digitalWrite(Left_motor_back,LOW);
  analogWrite(Left_motor_go,200);
  analogWrite(Left_motor_back,0);      //PWM ratio 0~255 speed control
  delay(time * 100);            //execution time, can be adjusted
}
void back(int time)          //back
{
  digitalWrite(Right_motor_go,LOW);   //right wheel back
  digitalWrite(Right_motor_back,HIGH);
  analogWrite(Right_motor_go,0);
  analogWrite(Right_motor_back,150); //PWM ratio 0~255 speed control
  digitalWrite(Left_motor_go,LOW);    //left wheel back
  digitalWrite(Left_motor_back,HIGH);
  analogWrite(Left_motor_go,0);
  analogWrite(Left_motor_back,150);   //PWM ratio 0~255 speed control
  delay(time * 100);        //execution time, can be adjusted
}
void loop()
{
  int i;
  delay(2000); //Start up after delay 2S
  run(10);
  back(10);
  brake(5);
  for(i=0;i<5;i++)
  {
    run(10);    //5 steps in the discontinuous advance of the car
    brake(1);
  }
  for(i=0;i<5;i++)
  {
    back(10);   //5 steps in the discontinuous back of the car
    brake(1);
  }
  for(i=0;i<5;i++)
```

```
{
  left(10);//Large sets of small bend left rotation continuously
  spin_left(5);
}
for(i=0;i<5;i++)
{
  right(10);//Large sets of small bend right rotation continuously
  spin_right(5);
}
for(i=0;i<10;i++)
{
  right(1);//turn right intermittently
  brake(1);
}
for(i=0;i<10;i++)
{
  left(1);//turn left intermittently
  brake(1);
}
for(i=0;i<10;i++)
{
  left(3);//Go S - shaped ways
  right(3);
}
for(i=0;i<10;i++)
{
  spin_left(3);//left rotation intermittently
  brake(3);
}
for(i=0;i<10;i++)
{
  spin_right(3);//right rotation intermittently
  brake(3);
}
}
```

Experimental steps:

1. We need to open the code of this experiment: **ColorfulRun.ino**, click " √ " under the menu bar to compile the code, and wait for the word "**Done compiling** " in the lower right corner, as shown in the figure below.
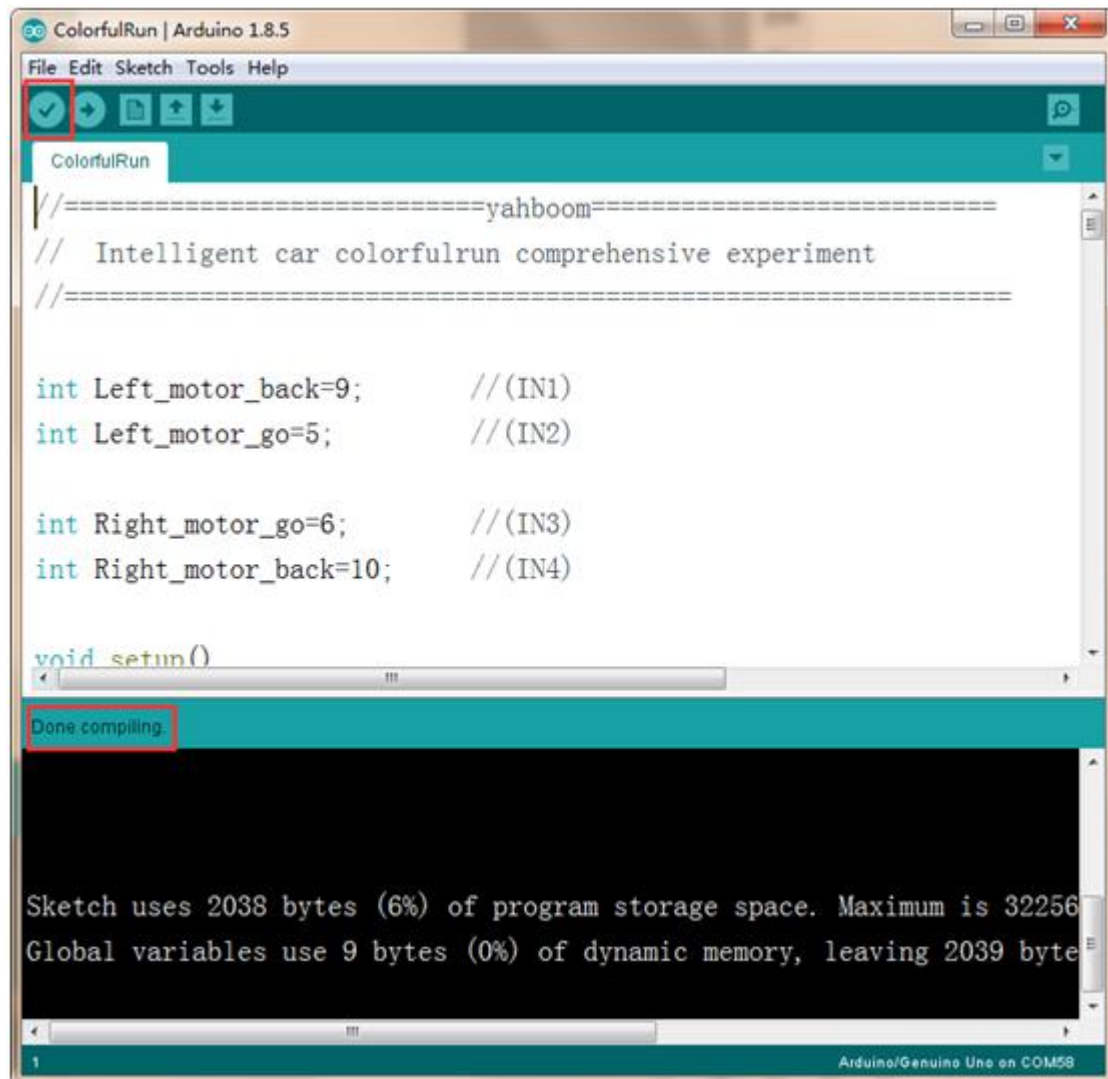
2. In the menu bar of Arduino IDE, we need to select 【Tools】 --- 【Port】 --- selecting the port that the serial number displayed by the device manager just now, as shown in the figure below.
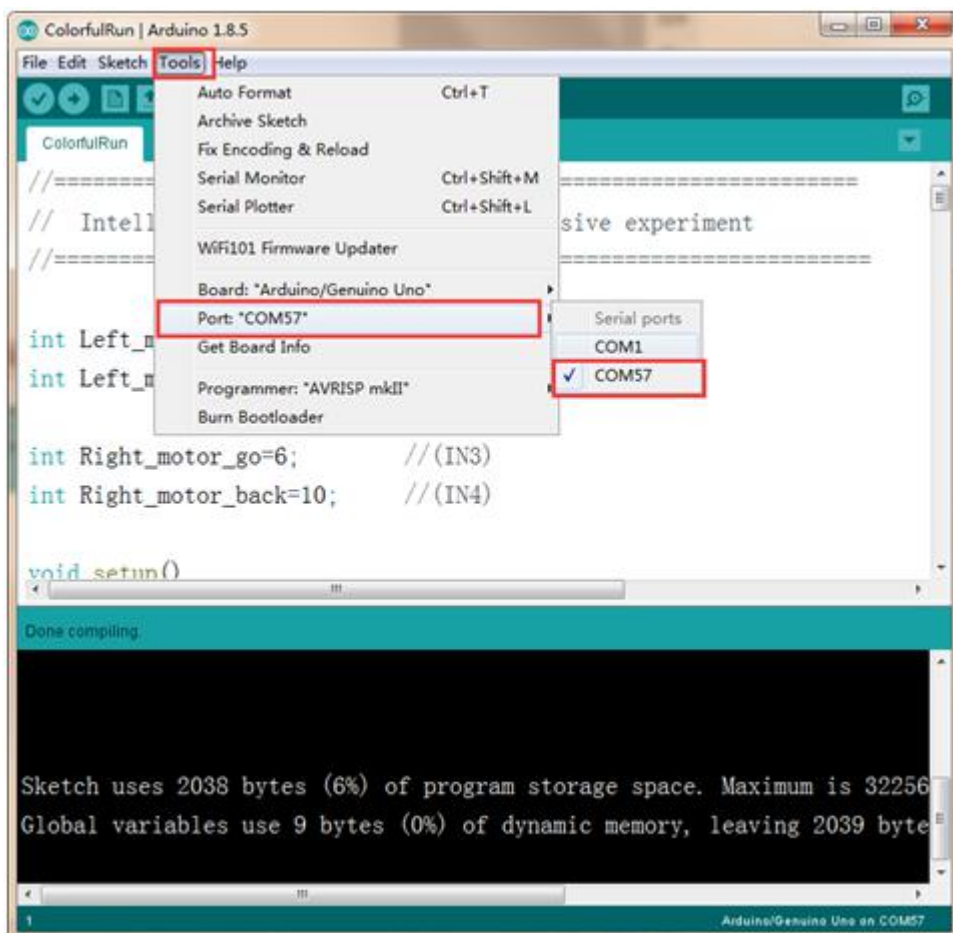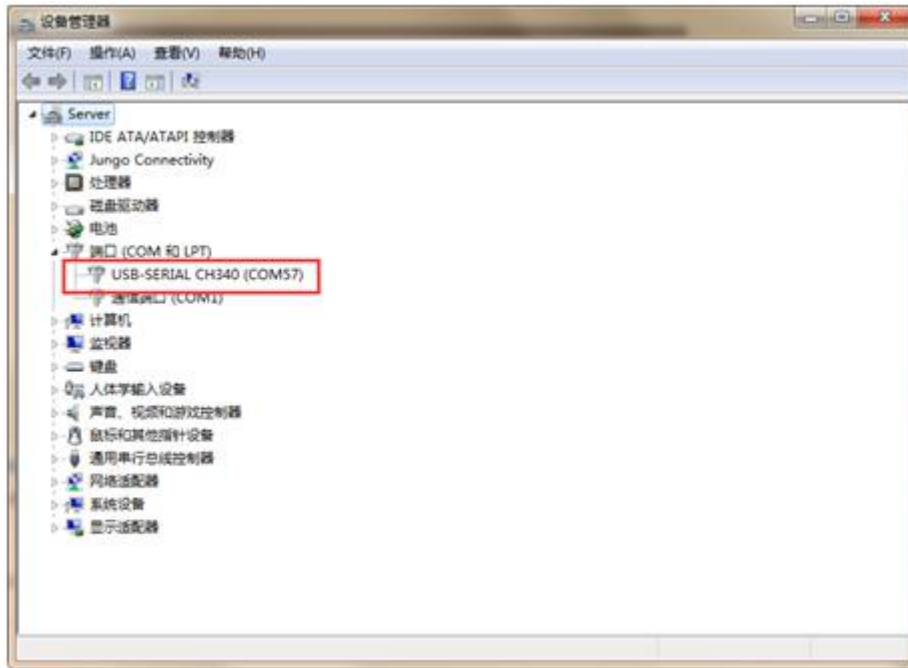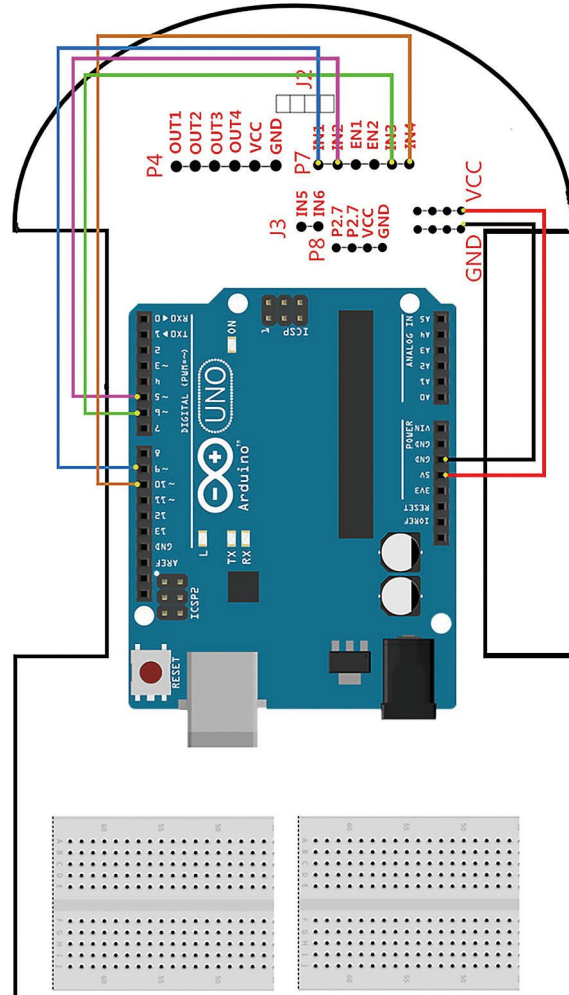
3. After the selection is completed, you need to click "→"under the menu bar to upload the code to the Arduino UNO board. When the word "**Done uploading**" appears in the lower left corner, the code has been successfully uploaded to the Arduino UNO board, as shown in the figure below.
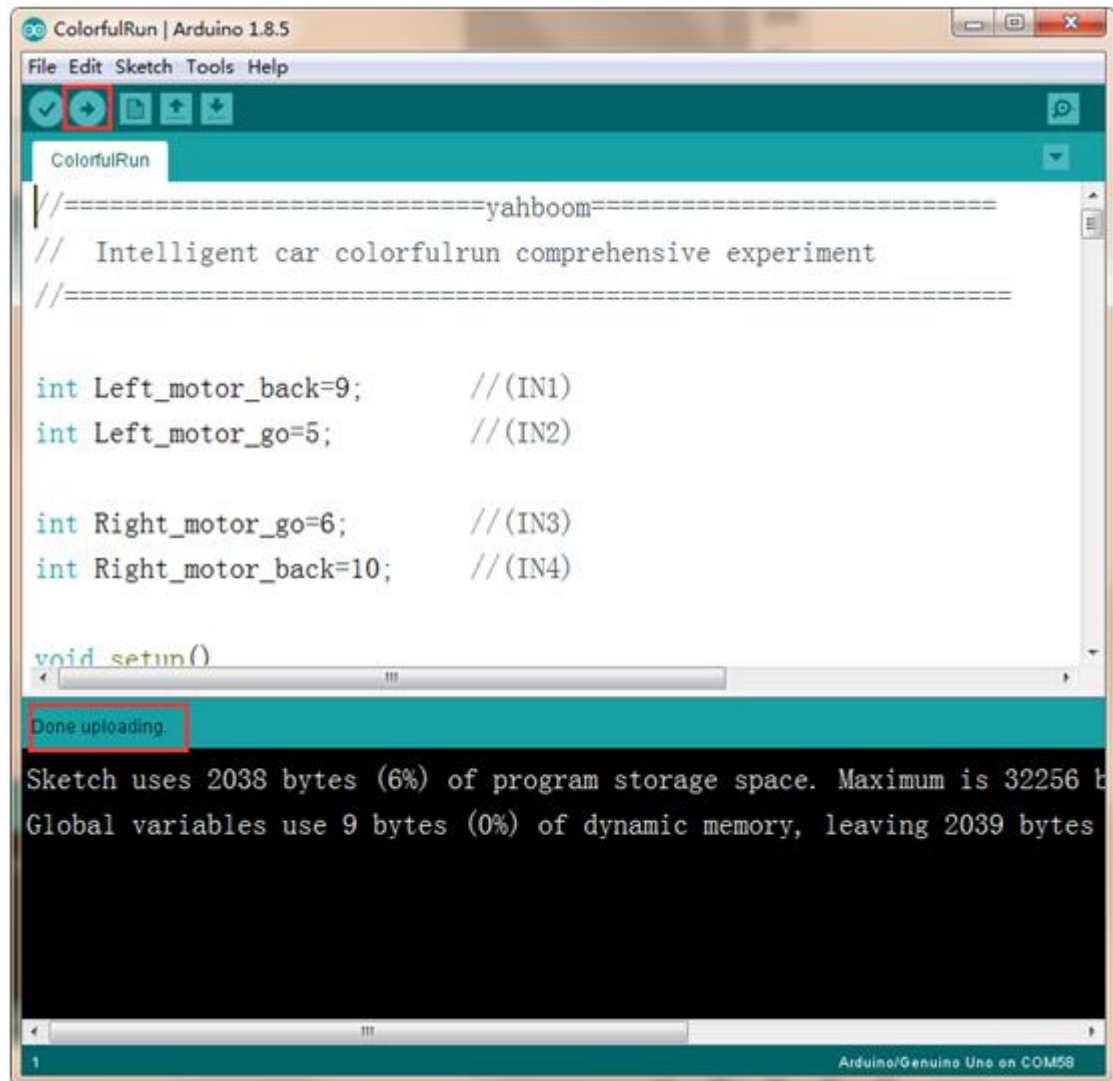
4.Please wire the Smart Car as shown below.
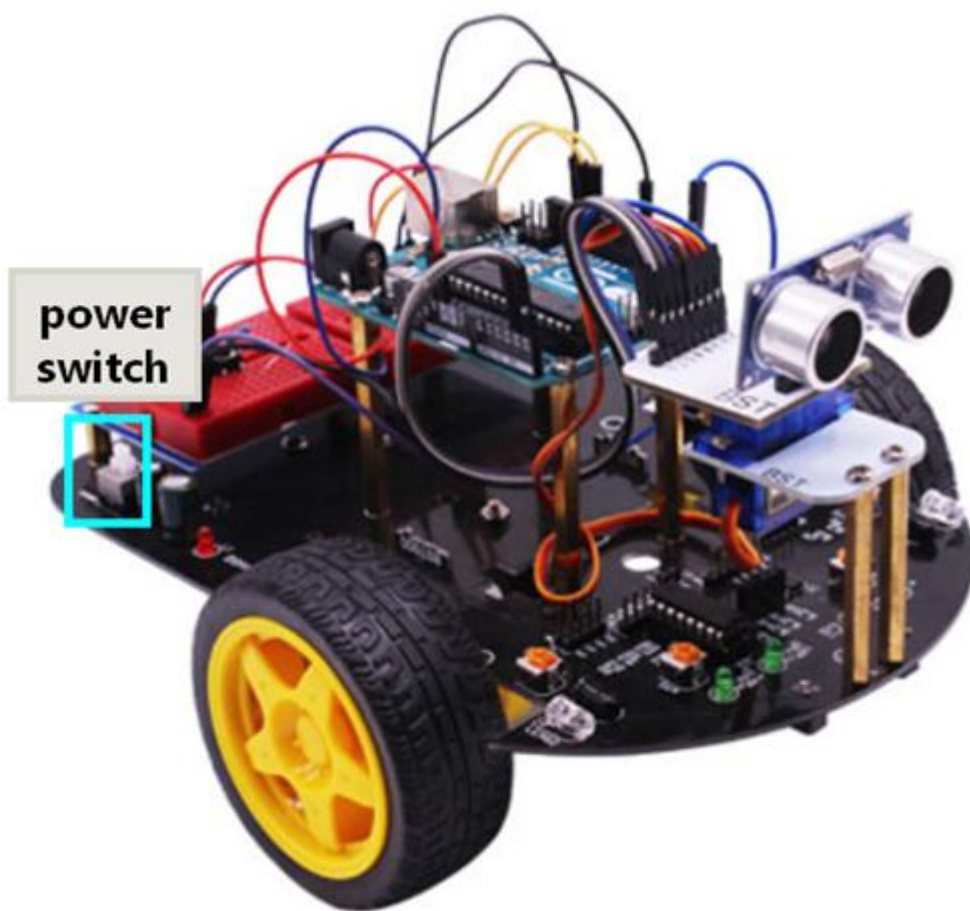
IV. Wiring Instructions

4.1 Motor drive wiring diagram

According to this wiring diagram, the smart car can realize forward, backward, left, right, and specified fancy movements after uploading the corresponding program.

5. Unplug the USB cable, place the smart car in a wide area, turn on the power switch, pause the smart car for two seconds, and then start the specified fancy action.

power
switch