```
#include <IRremote.h>
#include <Servo.h>
//************************??????************************
int MotorRight1=5;
int MotorRight2=6;
int MotorLeft1=10;
int MotorLeft2=11;
int counter=0;
const int irReceiverPin = 2; //?????? OUTPUT ???? pin 2

//************************???????IRcode************************
long IRfront= 0x00FFA25D;       //???
long IRback=0x00FF629D;        //??
long IRturnright=0x00FFC23D;    //??
long IRturnleft= 0x00FF02FD;    //??
long IRstop=0x00FFE21D;        //??
long IRcny70=0x00FFA857;       //CNY70????
long IRAutorun=0x00FF906F;     //???????
long IRturnsmallleft= 0x00FF22DD;
//**************************??CNY70??*************************************
const int SensorLeft = 7;     //???????
const int SensorMiddle= 4 ;   //???????
const int SensorRight = 3;    //???????
int SL;   //??????
int SM;   //??????
int SR;   //??????
IRrecv irrecv(irReceiverPin);  // ?? IRrecv ??????????
decode_results results;       // ??????? decode_results ??? result ???
//**************************???????*****************************
int inputPin =13 ; // ???????????rx
int outputPin =12; // ???????????'tx
int Fspeedd = 0; // ????
int Rspeedd = 0; // ????
int Lspeedd = 0; // ????
int directionn = 0; // ?=8 ?=2 ?=4 ?=6
Servo myservo; // ? myservo
int delay_time = 250; // ????????????
int Fgo = 8; // ??
int Rgo = 6; // ??
int Lgo = 4; // ??
int Bgo = 2; // ??
//*****************************************************************(SETUP)
void setup()
{
 Serial.begin(9600);
 pinMode(MotorRight1, OUTPUT);  // ?? 8 (PWM)
```

```
  pinMode(MotorRight2, OUTPUT);  // ?? 9 (PWM)
  pinMode(MotorLeft1,  OUTPUT);  // ?? 10 (PWM)
  pinMode(MotorLeft2,  OUTPUT);  // ?? 11 (PWM)
  irrecv.enableIRIn();     // ???????
   pinMode(SensorLeft, INPUT); //??????
  pinMode(SensorMiddle, INPUT);//??????
  pinMode(SensorRight, INPUT); //??????
  digitalWrite(2,HIGH);
  pinMode(inputPin, INPUT); // ?????????
  pinMode(outputPin, OUTPUT); // ?????????
  myservo.attach(9); // ?????????5??(PWM)


 }
//**************************************************************************(Void)
void advance(int a) // ??
{
      digitalWrite(MotorRight1,LOW);
      digitalWrite(MotorRight2,HIGH);
      digitalWrite(MotorLeft1,LOW);
      digitalWrite(MotorLeft2,HIGH);
      delay(a * 100);
}
void right(int b) //??(??)
{
     digitalWrite(MotorLeft1,LOW);
     digitalWrite(MotorLeft2,HIGH);
     digitalWrite(MotorRight1,LOW);
     digitalWrite(MotorRight2,LOW);
     delay(b * 100);
}
void left(int c) //??(??)
{
    digitalWrite(MotorRight1,LOW);
    digitalWrite(MotorRight2,HIGH);
    digitalWrite(MotorLeft1,LOW);
    digitalWrite(MotorLeft2,LOW);
    delay(c * 100);
}
void turnR(int d) //??(??)
{
    digitalWrite(MotorRight1,HIGH);
    digitalWrite(MotorRight2,LOW);
    digitalWrite(MotorLeft1,LOW);
    digitalWrite(MotorLeft2,HIGH);
    delay(d * 100);
}
void turnL(int e) //??(??)
{
    digitalWrite(MotorRight1,LOW);
```

```
    digitalWrite(MotorRight2,HIGH);
    digitalWrite(MotorLeft1,HIGH);
    digitalWrite(MotorLeft2,LOW);
    delay(e * 100);
}
void stopp(int f) //??
{
   digitalWrite(MotorRight1,LOW);
   digitalWrite(MotorRight2,LOW);
   digitalWrite(MotorLeft1,LOW);
   digitalWrite(MotorLeft2,LOW);
   delay(f * 100);
}
void back(int g) //??
{
      digitalWrite(MotorRight1,HIGH);
      digitalWrite(MotorRight2,LOW);
      digitalWrite(MotorLeft1,HIGH);
      digitalWrite(MotorLeft2,LOW);;
      delay(g * 100);
}
void detection() //??3???(?.?.?)
{
  int delay_time = 250; // ???????????
  ask_pin_F(); // ??????

  if(Fspeedd < 10) // ????????10??
 {
    stopp(1); // ??????
    back(2); // ?? 0.2?
 }
  if(Fspeedd < 25) // ????????25??
 {
    stopp(1); // ??????
    ask_pin_L(); // ??????
    delay(delay_time); // ????????
    ask_pin_R(); // ??????
    delay(delay_time); // ????????

    if(Lspeedd > Rspeedd) //?? ??????????
   {
     directionn = Lgo; //???
   }

    if(Lspeedd <= Rspeedd) //?? ?????????????
    {
     directionn = Rgo; //???
    }

    if (Lspeedd < 15 && Rspeedd < 15) //?? ????????????10??
```

```
    {
      directionn = Bgo; //???
     }
    }
    else //??????25??
   {
     directionn = Fgo; //???
   }
}
//*****************************************************************************
void ask_pin_F() // ??????
{
myservo.write(90);
digitalWrite(outputPin, LOW); // ?????????2?s
delayMicroseconds(2);
digitalWrite(outputPin, HIGH); // ?????????10?s??????10?s
delayMicroseconds(10);
digitalWrite(outputPin, LOW); // ??????????
float Fdistance = pulseIn(inputPin, HIGH); // ??????
Fdistance= Fdistance/5.8/10; // ???????????????
Serial.print("F distance:"); //???????????
Serial.println(Fdistance); //????
Fspeedd = Fdistance; // ??? ??Fspeedd(??)
}
//*****************************************************************************
void ask_pin_L() // ??????
{
myservo.write(177);
delay(delay_time);
digitalWrite(outputPin, LOW); // ?????????2?s
delayMicroseconds(2);
digitalWrite(outputPin, HIGH); // ?????????10?s??????10?s
delayMicroseconds(10);
digitalWrite(outputPin, LOW); // ??????????
float Ldistance = pulseIn(inputPin, HIGH); // ??????
Ldistance= Ldistance/5.8/10; // ???????????????
Serial.print("L distance:"); //???????????
Serial.println(Ldistance); //????
Lspeedd = Ldistance; // ??? ??Lspeedd(??)
}
//*****************************************************************************
void ask_pin_R() // ??????
{
myservo.write(5);
delay(delay_time);
digitalWrite(outputPin, LOW); // ?????????2?s
delayMicroseconds(2);
digitalWrite(outputPin, HIGH); // ?????????10?s??????10?s
delayMicroseconds(10);
digitalWrite(outputPin, LOW); // ??????????
```

```
float Rdistance = pulseIn(inputPin, HIGH); // ??????
Rdistance= Rdistance/5.8/10; // ???????????????
Serial.print("R distance:"); //???????????
Serial.println(Rdistance); //????
Rspeedd = Rdistance; // ??? ??Rspeedd(??)
}
//*****************************************************************************(LOOP)
void loop()
{
    SL = digitalRead(SensorLeft);
    SM = digitalRead(SensorMiddle);
    SR = digitalRead(SensorRight);
//*****************************************************************************??????
 if (irrecv.decode(&results))
  {       // ??????????????
/*****************************************************************************/
    if (results.value == IRfront)//??
     {
      advance(10);//??
     }
/*****************************************************************************/
    if (results.value ==  IRback)//??
     {
      back(10);//??
     }
/*****************************************************************************/
    if (results.value == IRturnright)//??
    {
      right(6); // ??
    }
/*****************************************************************************/
   if (results.value == IRturnleft)//??
   {
     left(6); // ??);
   }
/*****************************************************************************/
  if (results.value == IRstop)//??
  {
   digitalWrite(MotorRight1,LOW);
   digitalWrite(MotorRight2,LOW);
   digitalWrite(MotorLeft1,LOW);
   digitalWrite(MotorLeft2,LOW);
  }
//*****************************************************************************cny70?????? ?:LOW ?:
  if (results.value == IRcny70)
  {
   while(IRcny70)
   {
     SL = digitalRead(SensorLeft);
     SM = digitalRead(SensorMiddle);
```

```
SR = digitalRead(SensorRight);

if (SM == HIGH)//?????????
{
  if (SL == LOW & SR == HIGH) // ????, ????
  {
    digitalWrite(MotorRight1,LOW);
    digitalWrite(MotorRight2,HIGH);
    analogWrite(MotorLeft1,0);
    analogWrite(MotorLeft2,80);
  }
  else if (SR == LOW & SL == HIGH) //????, ????
  {
    analogWrite(MotorRight1,0);//??
    analogWrite(MotorRight2,80);
    digitalWrite(MotorLeft1,LOW);
    digitalWrite(MotorLeft2,HIGH);
  }
 else  // ??????, ??
  {
    digitalWrite(MotorRight1,LOW);
    digitalWrite(MotorRight2,HIGH);
    digitalWrite(MotorLeft1,LOW);
    digitalWrite(MotorLeft2,HIGH);
    analogWrite(MotorLeft1,200);
    analogWrite(MotorLeft2,200);
    analogWrite(MotorRight1,200);
    analogWrite(MotorRight2,200);
 }
}
else // ?????????
{
  if (SL == LOW & SR == HIGH)// ????, ????
 {
    digitalWrite(MotorRight1,LOW);
    digitalWrite(MotorRight2,HIGH);
    digitalWrite(MotorLeft1,LOW);
    digitalWrite(MotorLeft2,LOW);
 }
  else if (SR == LOW & SL == HIGH) // ????, ????
 {
   digitalWrite(MotorRight1,LOW);
   digitalWrite(MotorRight2,LOW);
   digitalWrite(MotorLeft1,LOW);
   digitalWrite(MotorLeft2,HIGH);
 }
  else // ????, ??
 {
 digitalWrite(MotorRight1,HIGH);
 digitalWrite(MotorRight2,LOW);
```

```
      digitalWrite(MotorLeft1,HIGH);
      digitalWrite(MotorLeft2,LOW);;
      }
     }
      if (irrecv.decode(&results))
      {
          irrecv.resume();
              Serial.println(results.value,HEX);
          if(results.value ==IRstop)
          {
            digitalWrite(MotorRight1,HIGH);
            digitalWrite(MotorRight2,HIGH);
            digitalWrite(MotorLeft1,HIGH);
            digitalWrite(MotorLeft2,HIGH);
            break;
          }
      }
     }
     results.value=0;
  }
//*************************************************************************???????
 if (results.value ==IRAutorun )
     {
        while(IRAutorun)
      {
         myservo.write(90); //??????? ???? ????????
         detection(); //???? ???????????
          if(directionn == 8) //??directionn(??) = 8(??)
          {
            if (irrecv.decode(&results))
         {
          irrecv.resume();
          Serial.println(results.value,HEX);
          if(results.value ==IRstop)
          {
            digitalWrite(MotorRight1,LOW);
            digitalWrite(MotorRight2,LOW);
            digitalWrite(MotorLeft1,LOW);
            digitalWrite(MotorLeft2,LOW);
            break;
          }
         }
             results.value=0;
             advance(1); // ????
             Serial.print(" Advance "); //????(??)
             Serial.print(" ");
          }
         if(directionn == 2) //??directionn(??) = 2(??)
        {
          if (irrecv.decode(&results))
```

```
 {
  irrecv.resume();
  Serial.println(results.value,HEX);
  if(results.value ==IRstop)
  {
    digitalWrite(MotorRight1,LOW);
    digitalWrite(MotorRight2,LOW);
    digitalWrite(MotorLeft1,LOW);
    digitalWrite(MotorLeft2,LOW);
    break;
  }
 }
   results.value=0;
   back(8); // ??(?)
   turnL(3); //????????(????????)
   Serial.print(" Reverse "); //????(??)
}
 if(directionn == 6) //??directionn(??) = 6(??)
{
 if (irrecv.decode(&results))
 {
   irrecv.resume();
   Serial.println(results.value,HEX);
  if(results.value ==IRstop)
  {
    digitalWrite(MotorRight1,LOW);
    digitalWrite(MotorRight2,LOW);
    digitalWrite(MotorLeft1,LOW);
    digitalWrite(MotorLeft2,LOW);
    break;
  }
 }
  results.value=0;
    back(1);
    turnR(6); // ??
    Serial.print(" Right "); //????(??)
}
 if(directionn == 4) //??directionn(??) = 4(??)
{
  if (irrecv.decode(&results))
 {
  irrecv.resume();
  Serial.println(results.value,HEX);
  if(results.value ==IRstop)
  {
    digitalWrite(MotorRight1,LOW);
    digitalWrite(MotorRight2,LOW);
    digitalWrite(MotorLeft1,LOW);
    digitalWrite(MotorLeft2,LOW);
    break;
```

```
        }
       }
          results.value=0;
          back(1);
          turnL(6); // ??
          Serial.print(" Left "); //????(??)
       }

        if (irrecv.decode(&results))
       {
        irrecv.resume();
        Serial.println(results.value,HEX);
        if(results.value ==IRstop)
        {
         digitalWrite(MotorRight1,LOW);
         digitalWrite(MotorRight2,LOW);
         digitalWrite(MotorLeft1,LOW);
         digitalWrite(MotorLeft2,LOW);
         break;
        }
       }
      }
          results.value=0;
    }
/*************************************************************************/
   else
  {
      digitalWrite(MotorRight1,LOW);
      digitalWrite(MotorRight2,LOW);
      digitalWrite(MotorLeft1,LOW);
      digitalWrite(MotorLeft2,LOW);
   }


     irrecv.resume();   // ???????????
  }
}
```