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#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)

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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);

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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??

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{
  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); // ??????????

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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);

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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);
  }
}

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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))

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{
  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;
    }
  }
}

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    }
  }
  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(); // ??????????
}
}

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