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// #include <Servo.h>

#define in1 2 //Right motor pole 1
#define in2 3 //Right motor pole 2
#define in3 4 //left motor pole 1
#define in4 5 //left motor pole 1
// #define ena 5 //Right motor speed
// #define enb 6 //Right motor speed
// Servo myservo; // create servo object to control a servo
// int pos = 0; // variable to store the servo position
const int pingPin = 12; //Trigger Pin of Ultrasonic
const int echoPin = 13; //Echo Pin of Ultrasonic
long duration; //used by ultrasonic Function
int distance, Cdistance, Rdistance, Ldistance; //Cdistance=center Distance Rdistance=Right
Distance Ldistance=Left Distance
unsigned long z = 0;
#include "DHT.h"
#include <EEPROM.h>
int a = 0;
int value;
DHT dht(7, DHT11);
float humidity;

void setup()
{
  Serial.begin(9600); // Starting Serial Terminal
  pinMode(in1, OUTPUT);
  pinMode(in2, OUTPUT);
  pinMode(in3, OUTPUT);
  pinMode(in4, OUTPUT);
  // pinMode(ena, OUTPUT);
  // pinMode(enb, OUTPUT);
  pinMode(pingPin, OUTPUT); // Sets the trigPin as an Output
  pinMode(echoPin, INPUT); // Sets the echoPin as an Input
  // myservo.attach(9); // attaches the servo on pin 9 to the servo object
  // myservo.write(85); // Initial Pos of Servo at center
  dht.begin();
  Serial.begin(9600);
  for (int i = 0; i < 255; i++)
    EEPROM.write(i, i);
}

void loop()
{

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delay(2000);

humidity = dht.readHumidity() ;
Serial.print (" Humidity: ") ;
Serial.print ( humidity ) ;
Serial.println ( " %" ) ;
value = EEPROM.read(a);

Serial.print(a);
Serial.print("\t");
Serial.print(value);
Serial.println();

a = a + 1;

if (a == 512)
    a = 0;

delay(500);
while (z < 10 ) { z++; }
mark:
Cdistance = ultrasonic();//take ultrasonic distance value
if( Cdistance == 0 ){
    goto mark;
}

if(Cdistance>30)//if greater than 30 Cm
{
    forward();//go to forward
}
else
{
    if(Cdistance<=10 && Cdistance>2){
        reverse();// if close to object reverse to get more space to change orientation
    }
    off();          //stop robot
    // myservo.write(35);    //Turn servo Right
    delay(300);
    Rdistance = ultrasonic(); //get ultrasonic value at right
    // myservo.write(135);   // Turn servo Left
    delay(300);
    Ldistance = ultrasonic(); //get ultrasonic value at left
    // myservo.write(85);    //return to center pos
    delay(300);
    comparison(Rdistance, Ldistance); //go to Comparasion function
    off();          // stop after execute Comparison function action
    delay(150);

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}
// reset all variables
Rdistance=0;
Ldistance=0;
Cdistance=0;
}

int ultrasonic(void)//get distance captured by ultrasonic sensor
{
    long duration, inches, cm;
    pinMode(pingPin, OUTPUT);
    digitalWrite(pingPin, LOW);
    delayMicroseconds(2);
    digitalWrite(pingPin, HIGH);
    delayMicroseconds(10);
    digitalWrite(pingPin, LOW);
    pinMode(echoPin, INPUT);
    duration = pulseIn(echoPin, HIGH);

    cm = microsecondsToCentimeters(duration);
    Serial.print("distance = ");Serial.print(cm);Serial.println(" cm");

    return cm;
}
long microsecondsToCentimeters(long microseconds) {
    return microseconds / 29 / 2;
}

void comparison(int r, int l)//compare values of right and left Servo Pos
{
    if(r>25||l>25)
    {
        if(r>l||r==l)
        {
            Tright90();
        }else if(l>r)
        {
            Tleft90();
        }
    }else if(r<25&&l<25)
    {
        Tleft180();
    }
}
void forward()
{
    // analogWrite(ena,130);
    // analogWrite(enb,130);

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    digitalWrite(in1,LOW);
    digitalWrite(in2,HIGH);
    digitalWrite(in3,LOW);
    digitalWrite(in4,HIGH);
}
void off()
{
    digitalWrite(in1,LOW);
    digitalWrite(in2,LOW);
    digitalWrite(in3,LOW);
    digitalWrite(in4,LOW);
}
void Tleft90()
{
    // analogWrite(ena,160);
    // analogWrite(enb,150);
    digitalWrite(in1,LOW);
    digitalWrite(in2,HIGH);
    digitalWrite(in3,HIGH);
    digitalWrite(in4,LOW);
    delay(650);
}
void Tright90()
{
    // analogWrite(ena,150);
    // analogWrite(enb,160);
    digitalWrite(in1,HIGH);
    digitalWrite(in2,LOW);
    digitalWrite(in3,LOW);
    digitalWrite(in4,HIGH);
    delay(750);
}

void Tleft180()
{
    // analogWrite(ena,150);
    // analogWrite(enb,150);
    digitalWrite(in1,LOW);
    digitalWrite(in2,HIGH);
    digitalWrite(in3,HIGH);
    digitalWrite(in4,LOW);
    delay(1500);
}
void reverse()
{
    // analogWrite(ena,140);
    // analogWrite(enb,140);
    digitalWrite(in1,HIGH);
    digitalWrite(in2,LOW);
    digitalWrite(in3,HIGH);
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digitalWrite(in4,LOW);  
delay(450);  
}
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