**Team name: Brute Fives**

**Ultrasonic distance calculation and displaying on 7 segment display**

**Introduction:**

Ultrasonic distance sensor was used to find the distance of an object from the machine. The distance is reads every 2 second. The distance was calculated in cm. A 4\*7 segment (4 digit 7 segment) display was used to display the calculated distance. The display was done in active LOW mode.

**Components:**

Ultrasonic Distance Sensor

4 digit 7 segment display

Arduino Uno board

Jumper wires

Bread board

**Code:**

int trigPin = 13; // Trigger

int echoPin = 12; // Echo

long duration, cm, inches;

int pinA = 2;

int pinB = 3;

int pinC = 4;

int pinD = 5;

int pinE = 6;

int pinF = 7;

int pinG = 8;

int D1 = 9;

int D2 = 10;

int D3 = 11;

//int D4 = 12;

int D4 = 1;

int num\_array[10][7] = { LOW,LOW,LOW,LOW,LOW,LOW,HIGH , // 0

HIGH,LOW,LOW,HIGH,HIGH,HIGH,HIGH , // 1

LOW,LOW,HIGH,LOW,LOW,HIGH,LOW , // 2

LOW,LOW,LOW,LOW,HIGH,HIGH,LOW , // 3

HIGH,LOW,LOW,HIGH,HIGH,LOW,LOW , // 4

LOW,HIGH,LOW,LOW,HIGH,LOW,LOW , // 5

LOW,HIGH,LOW,LOW,LOW,LOW,LOW , // 6

LOW,LOW,LOW,HIGH,HIGH,HIGH,HIGH , // 7

LOW,LOW,LOW,LOW,LOW,LOW,LOW , // 8

LOW,LOW,LOW,HIGH,HIGH,LOW,LOW }; // 9

void setup() {

pinMode(pinA, OUTPUT);

pinMode(pinB, OUTPUT);

pinMode(pinC, OUTPUT);

pinMode(pinD, OUTPUT);

pinMode(pinE, OUTPUT);

pinMode(pinF, OUTPUT);

pinMode(pinG, OUTPUT);

pinMode(D1, OUTPUT);

pinMode(D2, OUTPUT);

pinMode(D3, OUTPUT);

pinMode(D4, OUTPUT);

//Serial Port begin

Serial.begin (9600);

//Define inputs and outputs

pinMode(trigPin, OUTPUT);

pinMode(echoPin, INPUT);

}

void loop() {

// The sensor is triggered by a HIGH pulse of 10 or more microseconds.

// Give a short LOW pulse beforehand to ensure a clean HIGH pulse:

delay(200);

digitalWrite(trigPin, LOW);

delayMicroseconds(5);

digitalWrite(trigPin, HIGH);

delayMicroseconds(10);

digitalWrite(trigPin, LOW);

// Read the signal from the sensor: a HIGH pulse whose

// duration is the time (in microseconds) from the sending

// of the ping to the reception of its echo off of an object.

pinMode(echoPin, INPUT);

duration = pulseIn(echoPin, HIGH);

// Convert the time into a distance

cm = (duration/2) / 29.1; // Divide by 29.1 or multiply by 0.0343

inches = (duration/2) / 74; // Divide by 74 or multiply by 0.0135

int i=0;

digitalWrite(D1, LOW);

digitalWrite(D2, LOW);

digitalWrite(D3, LOW);

digitalWrite(D4, LOW);

int digit[4] = {D1,D2,D3,D4};

int pins[8] = {pinA,pinB,pinC,pinD,pinE,pinF,pinG};

int n= cm;

Serial.print(inches);

Serial.print("in, ");

Serial.print(cm);

Serial.print("cm");

Serial.println();

int t[4];

for(i=3;i>-1;i--)

{

t[i] = n%10;

n=n/10;

}

for(i=0;i<4;i++)

{

Serial.print("t:");

Serial.print(t[i]);

}

for(int k=0;k<200;k++)

{

digitalWrite(D1, HIGH);

digitalWrite(D2, LOW);

digitalWrite(D3, LOW);

digitalWrite(D4, LOW);

//0

digitalWrite(pinA, num\_array[t[0]][0]);

digitalWrite(pinB, num\_array[t[0]][1]);

digitalWrite(pinC, num\_array[t[0]][2]);

digitalWrite(pinD, num\_array[t[0]][3]);

digitalWrite(pinE, num\_array[t[0]][4]);

digitalWrite(pinF, num\_array[t[0]][5]);

digitalWrite(pinG, num\_array[t[0]][6]);

//for (int j=0; j < 7; j++)

// digitalWrite(pins[j], num\_array[t[0]][j]);

delay(1); // wait for a second

digitalWrite(D1, LOW);

digitalWrite(D2, HIGH);

digitalWrite(D3, LOW);

digitalWrite(D4, LOW);

//1

digitalWrite(pinA, num\_array[t[1]][0]);

digitalWrite(pinB, num\_array[t[1]][1]);

digitalWrite(pinC, num\_array[t[1]][2]);

digitalWrite(pinD, num\_array[t[1]][3]);

digitalWrite(pinE, num\_array[t[1]][4]);

digitalWrite(pinF, num\_array[t[1]][5]);

digitalWrite(pinG, num\_array[t[1]][6]);

//for (int j=0; j < 7; j++)

// digitalWrite(pins[j], num\_array[t[1]][j]);

delay(1); // wait for a second

digitalWrite(D1, LOW);

digitalWrite(D2, LOW);

digitalWrite(D3, HIGH);

digitalWrite(D4, LOW);

//2

digitalWrite(pinA, num\_array[t[2]][0]);

digitalWrite(pinB, num\_array[t[2]][1]);

digitalWrite(pinC, num\_array[t[2]][2]);

digitalWrite(pinD, num\_array[t[2]][3]);

digitalWrite(pinE, num\_array[t[2]][4]);

digitalWrite(pinF, num\_array[t[2]][5]);

digitalWrite(pinG, num\_array[t[2]][6]);

//for (int j=0; j < 7; j++)

// digitalWrite(pins[j], num\_array[t[2]][j]);

delay(1); // wait for a second

digitalWrite(D1, LOW);

digitalWrite(D2, LOW);

digitalWrite(D3, LOW);

digitalWrite(D4, HIGH);

//3

//for (int j=0; j < 7; j++)

// digitalWrite(pins[j], num\_array[t[3]][j]);

digitalWrite(pinA, num\_array[t[3]][0]);

digitalWrite(pinB, num\_array[t[3]][1]);

digitalWrite(pinC, num\_array[t[3]][2]);

digitalWrite(pinD, num\_array[t[3]][3]);

digitalWrite(pinE, num\_array[t[3]][4]);

digitalWrite(pinF, num\_array[t[3]][5]);

digitalWrite(pinG, num\_array[t[3]][6]);

//delay(50); // wait for a second

delay(1);

}

digitalWrite(D1, LOW);

digitalWrite(D2, LOW);

digitalWrite(D3, LOW);

digitalWrite(D4, LOW);

digitalWrite(pinA, HIGH);

digitalWrite(pinB, HIGH);

digitalWrite(pinC, HIGH);

digitalWrite(pinD, HIGH);

digitalWrite(pinE, HIGH);

digitalWrite(pinF, HIGH);

digitalWrite(pinG, HIGH);

}