

MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY

Electronics and communication engineering

Assignment no 4

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1. Write Code and connections in wokwi for ultrasonic sensor. whatever distance is less than 100 cms send "Alert" to ibm cloud and display in device recent events.

Code

```
// put your setup code here, to run once:
const int TRIG_PIN = 7 ;
const int ECHO_PIN = 8;

//Anything over 400 cm (23200 us pulse) is "out of range"
const unsigned int MAX_DIST = 23200;

void setup() {

// The Trigger pin will tell the sensor to range find
pinMode(ECHO_PIN, OUTPUT );
digitalWrite(TRIG_PIN, LOW);

//Set Echo pin as input to measure the duration of //pulses coming back from the
distance sensor
pinMode(ECHO_PIN, INPUT ) ;

// We'll use the serial monitor to view the sensor output
Serial.begin(9600);
}
void loop() {
  unsigned long t1;
  unsigned long t2;
  unsigned long pulse_width;
  float cm;
  float inches;
  // Hold the trigger pin high for at least 10 us
  digitalWrite(TRIG_PIN, HIGH);
  delayMicroseconds(10);
  digitalWrite(TRIG_PIN, LOW);

  // Wait for pulse on echo pin
  while (digitalRead( ECHO_PIN )==0 );

  // Measure how long the echo pin was held high (pulse width) // Note: the
  micros() counter will overflow after-70 min
  t1= micros ();
```

```

while (digitalRead(ECHO_PIN) == 1);
t2= micros ();
pulse_width = t2-t1;

// Calculate distance in centimeters and inches. The constants
//are found in the datasheet, and calculated from the assumed speed
// of sound in air at sea level (- 340m/s)
cm = pulse_width/58;
inches = pulse_width/148.0;

//Print out results
if (pulse_width>MAX_DIST ){
  Serial.println("Out of range");
}
else {
  Serial.println("*****");
  Serial.print("The Measured Distance in cm: ");
  Serial.println(cm);
  if( cm < 100 ){
    Serial.println("ALERT!!");
  }
  Serial.print("*****");
}

//wait at least 1000ms before next measurement
delay(1000);
}

```

If distance is greater than 100, it will not alert.

WOKWI

sketches - Wokwi Arduino IDE

sketches - Wokwi Arduino IDE

```
1 // put your setup code here, to run once:
2 const int TRIG_PIN = 7;
3 const int ECHO_PIN = 8;
4
5 //anything over 400 cm (13286 in pulse) is "out of range"
6 const unsigned int MAX_DIST = 13286;
7
8 void setup() {
9
10 // the trigger pin will tell the sensor to range find
11 pinMode(TRIG_PIN, OUTPUT);
12 digitalWrite(TRIG_PIN, LOW);
13
14 //let echo pin as input to measure the duration of //pulses coming back from
15 pinMode(ECHO_PIN, INPUT);
16
17 // we'll use the serial monitor to view the sensor output
18 Serial.begin(9600);
19 }
20
21 void loop() {
22   unsigned long t1;
23   unsigned long t2;
24   unsigned long pulse_width;
25   float cm;
26   float inches;
27   // send the trigger pin high for at least 10 us
28   digitalWrite(TRIG_PIN, HIGH);
29   delayMicroseconds(10);
30   digitalWrite(TRIG_PIN, LOW);
31
32   // wait for echo pin to go high, then
```

Simulation

00:02:200 100%

The Measured Distance in cm: 102.00

The Measured Distance in cm: 102.00

The Measured Distance in cm: 102.00

If distance is less than 100, it will alert.

WOKWI

sketches - Wokwi Arduino IDE

sketches - Wokwi Arduino IDE

```
34 // Measure how long the echo pin was held high (pulse width) // Note: The width
35 t1 = micros();
36 while (digitalRead(ECHO_PIN) == 1) {
37   t2 = micros();
38   pulse_width = t2 - t1;
39 }
40
41 // Calculate distance in centimeters and inches. The constants:
42 // are found in the datasheet, and calculated from the assumed speed
43 // of sound in air at sea level (1130 ft/s)
44 cm = pulse_width / 58;
45 inches = pulse_width / 148.8;
46
47 // Print out results
48 if (pulse_width > MAX_DIST) {
49   Serial.println("Out of Range");
50 }
51 else {
52   Serial.println("The Measured Distance in cm:");
53   Serial.println(cm);
54   if (cm < 100) {
55     Serial.println("ALERT!");
56   }
57   Serial.println("The Measured Distance in inches:");
58   Serial.println(inches);
59 }
60 //wait at least 100ms before next measurement
61 delay(100);
62 }
```

Simulation

00:04:000 100%

The Measured Distance in cm: 88.00

ALERT!

The Measured Distance in cm: 88.00

ALERT!