

## Assignment-4

**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.

The screenshot shows the Wokwi web interface with an Arduino Uno simulation. The sketch code is as follows:

```
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 (23200 us pulse) is "out of range"
6 const unsigned int MAX_DIST = 23200;
7
8 void setup() {
9
10 // The Trigger pin will tell the sensor to range find
11 pinMode(ECHO_PIN, OUTPUT);
12 digitalWrite(TRIG_PIN, LOW);
13
14 //Set Echo pin as input to measure the duration of //pulses coming back from t
15 pinMode(ECHO_PIN, INPUT);
16
17 // We'll use the serial monitor to view the sensor output
18 Serial.begin(9600);
19
20 void loop() {
21   unsigned long t1;
22   unsigned long t2;
23   unsigned long pulse_width;
24   float cm;
25   float inches;
26   // Hold the trigger pin high for at least 10 us
27   digitalWrite(TRIG_PIN, HIGH);
28   delayMicroseconds(10);
29   digitalWrite(TRIG_PIN, LOW);
30
31   // Wait for pulse on echo pin
```

The simulation output shows:

```
*****
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.

The screenshot shows the Wokwi web interface with an Arduino Uno simulation. The sketch code is as follows:

```
33
34 // Measure how long the echo pin was held high (pulse width) // Note: the micro
35 t1= micros ();
36 while (digitalRead(ECHO_PIN) == 1);
37 t2= micros ();
38 pulse_width = t2-t1;
39
40 // Calculate distance in centimeters and inches. The constants
41 // are found in the datasheet, and calculated from the assumed speed
42 // of sound in air at sea level (~340m/s)
43 cm = pulse_width/58;
44 inches = pulse_width/148.0;
45
46 //Print out results
47 if (pulse_width>MAX_DIST){
48   Serial.println("Out of range");
49 }
50 else {
51   Serial.println("*****");
52   Serial.print("The Measured Distance in cm: ");
53   Serial.println(cm);
54   if ( cm < 100 ){
55     Serial.println("ALERT!!");
56   }
57   Serial.print("*****");
58 }
59
60 //wait at least 1000ms before next measurement
61 delay(1000);
62 }
```

The simulation output shows:

```
*****
The Measured Distance in cm: 88.00
ALERT!!
*****
The Measured Distance in cm: 88.00
ALERT!!
*****
```