

## Assignment – 4

### IOT enabled Smart Farming Application

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**Write a code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 cms"send" alert to IBM Cloud and display in device recent events.**

#### **Solution:**

```
//Pins
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
Pin Mode(TRIG_PIN, OUTPUT);
digital Write(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 ){
    //while(true){
      Serial.println("Alert!!");
    //}
  }
  Serial.print("*****");
}

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

**OUTPUT:**

New Arduino Uno Project - Wokwi

wokwi.com/projects/new/arduino-uno

Resource list Gmail YouTube Maps New Tab

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sketch.ino diagram.json Library Manager

```
1 //pins
2 const int TRIG_PIN=7;
3 const int ECHO_PIN=8;
4
5 //Anything over 400cm (23200 us pulse) is "out of range"
6 const unsigned int MAX_DIST=23200;
7
8 void setup(){
9
10
11 //The trigger pin will tell the sensor to range find
12 pinMode(TRIG_PIN,OUTPUT);
13 digitalWrite(TRIG_PIN,LOW);
14
15 //Set echo pin as input to measure the duration of
16 //pulses coming back from the distance sensor
17 pinMode(ECHO_PIN, INPUT);
18
19 //We'll use the serial monitor to view the sensor output
20 Serial.begin(9600);
21 }
22 void loop(){
23   unsigned long t1;
24   unsigned long t2;
25   unsigned long pulse_width;
26   float cm;
27   float inches;
28   //Hold the trigger pin high for atleast 10 us
29   digitalWrite(TRIG_PIN,HIGH);
```

Simulation

01:11.599 98%

\*\*\*\*\* The Measured Distance in cm : 201.79 \*\*\*\*\*

33°C Sunny 16:58