## **Assignment-4**

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1. Write Code and connections in wokwi for ultrasonic sensor. whatever distance is less than 100 cm 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:**

1. If the distance is less than 100 cm, it alerts.

```
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                                                                                                                                 Simulation
    hc-sr04.ino diagram.json ● Library Manager ▼
              // Pins
const int TRIG_PIN = 7;
const int ECHO_PIN = 8;
                                                                                                                                                                                                                              ₫00:00.466 (%58%
              // Anything over 400 cm (23200 us pulse) is "out of range" const unsigned int MAX_DIST = 23200;
                // The Trigger pin will tell the sensor to range find
pinMode(TRIG_PIN, OUTPUT);
digitalWrite(TRIG_PIN, LOW);
                                                                                                                                                             OO UNO
                //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); \label{eq:serial.begin}
                                                                                                                                                                   PORT REALISE IN
              void loop() {
                unsigned long t1;
unsigned long t2;
unsigned long pulse_width;
float cm;
float inches;
                                                                                                                            The Measured Distance in cm : 84.14
                                                                                                                                                                                                                                    // Hold the trigger pin high for at least 10 us
```

2. If the distance is more than 100 cm, it won't alert

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               hc-sr04.ino
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                                                          // Pins
const int TRIG PIN = 7;
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                                                            const int ECHO_PIN = 8;
                                                             // Anything over 400 cm (23200 us pulse) is "out of range"
                                                             const unsigned int MAX_DIST = 23200;
                                                                         // The Trigger pin will tell the sensor to range find
                                                                     pinMode(TRIG_PIN, OUTPUT);
digitalWrite(TRIG_PIN, LOW);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TOO UNO ...
                                                                         //Set Echo pin as input to measure the duration of //pulses coming back from the distance sensor
                                                                         pinMode(ECHO PIN, INPUT);
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19
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                                                                     // We'll use the serial monitor to view the sensor output Serial.begin(9500); \label{eq:serial} % \[ \frac{1}{2} \left( \frac{1}{2} \right) \left( 
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                                                             void loop() {
                            23
                                                                           unsigned long t1;
                                                                         unsigned long t2;
unsigned long pulse_width;
                            25
26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                The Measured Distance in cm : 227.10
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                                                                         float cm;
float inches;
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```

## 3. Simulation and code execution





