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.

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.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 cms ,it alerts

```
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           const int TRIG_PIN = 7;
                                                                                                           5 📵 🕞
           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(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}
                                                                                                                                        void loop() {
            unsigned long t1;
unsigned long t2;
unsigned long pulse_width;
float cm;
float inches;
                                                                                                        The Measured Distance in cm : 84.14
                                                                                                        Alert!!
                                                                                                        // Hold the trigger pin high for at least 10 us
```

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

```
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           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(TRIG_PIN, OUTPUT);
digitalWrite(TRIG_PIN, LOW);
             //Set Echo pin as input to measure the duration of \ensuremath{//}\xspace \text{pulses} coming back from the distance sensor
     15
            pinMode(ECHO_PIN, INPUT);
             // We'll use the serial monitor to view the sensor output
     19
             Serial.begin(9600);
                                                                                                                                NOWER ANALOG IN
           void loop() {
             unsigned long t1;
             unsigned long t2;
                                                                                                  The Measured Distance in cm : 227.10
             unsigned long pulse_width;
                                                                                                  ***********
                                                                                                                                                         Activate Windows
             float inches;
                                                                                                                                                         Go to Settings to activate Windows
```

3. Simulation and code executio





