Assignment-4

Team ID: PNT2022TMID28270

Name: Kharthiga S

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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           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 \star 23200;
           void setup() {
             // The Trigger pin will tell the sensor to range find
pinMode(TRIG_PIN, OUTPUT);
digitalWrite(TRIG_PIN, LOW);
                                                                                                                                              UNO 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);
                                                                                                                                                   PER PORT REGER
           void loop() {
             unsigned long t1;
unsigned long t2;
unsigned long pulse_width;
float cm;
float inches;
                                                                                                                 ************************
                                                                                                                The Measured Distance in cm : 84.14
                                                                                                                Alert!!
                                                                                                                                                                                                               W 11 10
             // 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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          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;
            // The Trigger pin will tell the sensor to range find
pinMode(TRIG_PIN, OUTPUT);
    11
            digitalWrite(TRIG_PIN, LOW);
                                                                                                                          OO UNO
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15
            //Set Echo pin as input to measure the duration of \ensuremath{//\mathrm{pulses}} coming back from the distance sensor
            pinMode(ECHO_PIN, INPUT);
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            // We'll use the serial monitor to view the sensor output
            Serial.begin(9600);
                                                                                                                          POWER ANALOG IN
          void loop() {
    24
25
            unsigned long t2;
                                                                                             The Measured Distance in cm : 227.10
             unsigned long pulse_width;
                                                                                             *******************
                                                                                                                                                  Activate Windows
             float cm;
            float inches;
```

3. Simulation and code execution





