## **IBM ASSIGNMENT-** 4

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Write Code and connections in wokwi for ultrasonic sensor. whatever distance is less than 100 cms send an "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 cms, it alerts.

```
WOKWI SAVE - SHARE
                                                                                                             Simulation
 hc-sr04.ino diagram json ◆ Library Manager ▼
          // Pins
const int TRIG_PIN = 7;
const int ECHO_PIN = 8;
                                                                                                                                                                                             ₫00:00.466 (%58%
                                                                                                             5 🗖 🕒
          // 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, IMPUT);
            // We'll use the serial monitor to view the sensor output
Serial.begin(9600);
                                                                                                                                          POWER ANALOG IS
            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 cms, it won't alert

```
WOKWI - SAVE
 hc-sr04.ino diagram.json ● Library Manager ▼
                                                                                           Simulation
                                                                                                                                                             ₫00:00.599 (%62%
        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);
   12
           digitalWrite(TRIG_PIN, LOW);
   14
15
           //Set Echo pin as input to measure the duration of 
//pulses coming back from the distance sensor
           pinMode(ECHO_PIN, INPUT);
   17
18
           // We'll use the serial monitor to view the sensor output
   19
           Serial.begin(9600);
   20
21
                                                                                                                    POWER ANALOG IN
         void loop() {
           unsigned long t1;
           unsigned long t2;
                                                                                        The Measured Distance in cm : 227.10
           unsigned long pulse_width;
                                                                                        ***********************
   27
                                                                                                                                           Activate Windows
   28
           float inches;
                                                                                                                                           Go to Settings to activate Windows
```

3. Simulation and code execution





