

IBM ASSIGNMENT- 4

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Write Code and connections in wokwi for ultrasonic sensor. whatever distance is less than 100 cms send "Alert" to ibm cloud aand 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.

The screenshot displays the Wokwi IDE interface. On the left, the code for `hc-sr04.ino` is shown:

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

On the right, the simulation shows an Arduino Uno board with an HC-SR04 sensor connected. The "Editing Ultrasonic Distance Sensor" panel indicates a distance of 83cm. The serial monitor output shows:

```
*****  
The Measured Distance in cm : 84.14  
Alert!!  
*****
```

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

WOKWI


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hc-sr04.ino diagram.json Library Manager

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

Simulation



The Measured Distance in cm : 227.10

Activ
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3.Simulation and code execution