

## TEAM ID : PNT2022TMID45187

### Assignment 4 :

Write code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events.

### Program

```
//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
    pinMode(TRIG_PIN, OUTPUT);
    digitalWrite(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.



```
10 | // The Trigger pin will tell the sensor to range find
```

```
*****Out of rangeThe Measured Distance in  
etc: 268.00
```

```
18 | }  
19 | void loop() {  
20 |   unsigned long t1;  
21 |   unsigned long t2;  
22 |   unsigned long pulse_width;  
23 |   float cm;           The Measured Distance in cm: 197.00
```

```
The Measured Distance in cm: 2.00  
Alert!!
```



```
10 | // The Trigger pin will tell the sensor to range find
```

ee

```
15 | pinMode(ECHO_PIN, INPUT );
```

```
12 | digitalWrite(TRIG_PIN, LOW);  
21 | unsigned long t2;  
22 | unsigned long pulse_width;  
The  
Measured Distance in cm: 2.00  
Alert!!
```

The screenshot displays the Wokwi web IDE interface. On the left, the 'sketch.ino' file is open, showing an Arduino C++ program for an ultrasonic sensor. The code includes pin definitions, a setup function to initialize the trigger and echo pins, and a loop function that measures the distance and prints it to the serial monitor. The right side of the interface shows a 'Simulation' window with a visual representation of the Arduino board and an ultrasonic sensor module connected. Below the simulation, the serial monitor output is visible, showing the measured distance in centimeters and an alert message. The bottom status bar indicates network usage (3.2 KBps, 0.1 KBps) and system time (12:25, 28-10-2022).

```
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  //Set Echo pin as input to measure the duration of  
14  //pulses coming back from the distance sensor  
15  pinMode(ECHO_PIN, INPUT );  
16  // We'll use the serial monitor to view the sensor output  
17  Serial.begin(9600);  
18 }  
19  
20 void loop() {  
21   unsigned long t1;  
22   unsigned long t2;  
23   unsigned long pulse_width;  
24   float cm;  
25   float inches;
```

Simulation

00:44.723 97%

The Measured Distance in cm: 91.00  
Alert!!  
The Measured Distance in cm: 124.00

31°C Cloudy

3.2 KBps  
0.1 KBps

ENG IN

12:25  
28-10-2022

Link: <https://wokwi.com/projects/346743469024215636>