

**TEAM ID : PNT2022TMID43421**

**Team leader : Balvanannathan A**

#### **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**

```
const int TRIG_PIN=7;
const int ECHO_PIN=8;

const unsigned int MAX_DIST=23200;

void setup(){

    pinMode(TRIG_PIN,OUTPUT);
    digitalWrite(TRIG_PIN,LOW);
    pinMode(ECHO_PIN,INPUT);
    Serial.begin(9600);
}

void loop() {
    unsigned long t1;
    unsigned long t2;
    unsigned long pulse_width; float cm;
    float inches;

    digitalWrite(TRIG_PIN,HIGH); delayMicroseconds(10);
    digitalWrite(TRIG_PIN,LOW);

    while(digitalRead(ECHO_PIN)==0);

    t1= micros();
    while(digitalRead(ECHO_PIN)==1); t2= micros();
```

```

pulse_width=t2-t1;
cm=pulse_width/ 58 ;
inches=pulse_width/148.0;
if (pulse_width>MAX_DIST){
    Serial.println("Outofrange");
}
else{
    Serial.println("*****");
    Serial.print("TheMeasuredDistanceincm:");
    Serial.println(cm);

    if( cm < 100 ){

        Serial.println("Alert!!");

    }
    Serial.print("*****");
}
}
delay(1000);
}

```

## Output:

1. If the distance is less than 100 cms ,it alerts.

IBM

sketchino copy - Wokwi Arduino X

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

```
14 //pulses coming back from the distance sensor
```

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

```
18 }
19 void loop() {
20   unsigned long t1;
21   unsigned long t2;
22   unsigned long pulse_width;
23   float cm;
```

The Mea en red Dr stance in etc: 2 68.00

\*\*\*\*\*Out of range

TneMeasuredDistanceincm:197.00

TheMeasuredDistanceincm:2.00

Alert!!

31°C  
Cloudy



7.2 KBps  
2.0 KBps

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ECE



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

```
12 digitalWrite(TRIG_PIN, LOW);
```

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

```
21 unsigned long t2;
22 unsigned long pulse_width;
```

TheMeasuredDistanceincm:2.00

Alert!!

31°C  
Cloudy



0.2 KBps  
0.0 KBps

ENG  
IN 12:21  
28-10-2022

Wokwi Arduino IDE interface showing a sketch and its simulation.

**Sketch Code (sketch.ino):**

```
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:**

The simulation shows an Arduino Uno connected to an HC-SR04 ultrasonic sensor. The sensor is connected to the Arduino's TRIG\_PIN (7) and ECHO\_PIN (8). The simulation displays the measured distance in cm and inches.

**Simulation Output:**

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

**System Information:**

31°C Cloudy | 3.2 KBps | 0.1 KBps | ENG IN | 12:25 | 28-10-2022