

## Assignment-4

**Team ID:** PNT2022TMID52019

**Name:** Jennethwyn E M

**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);

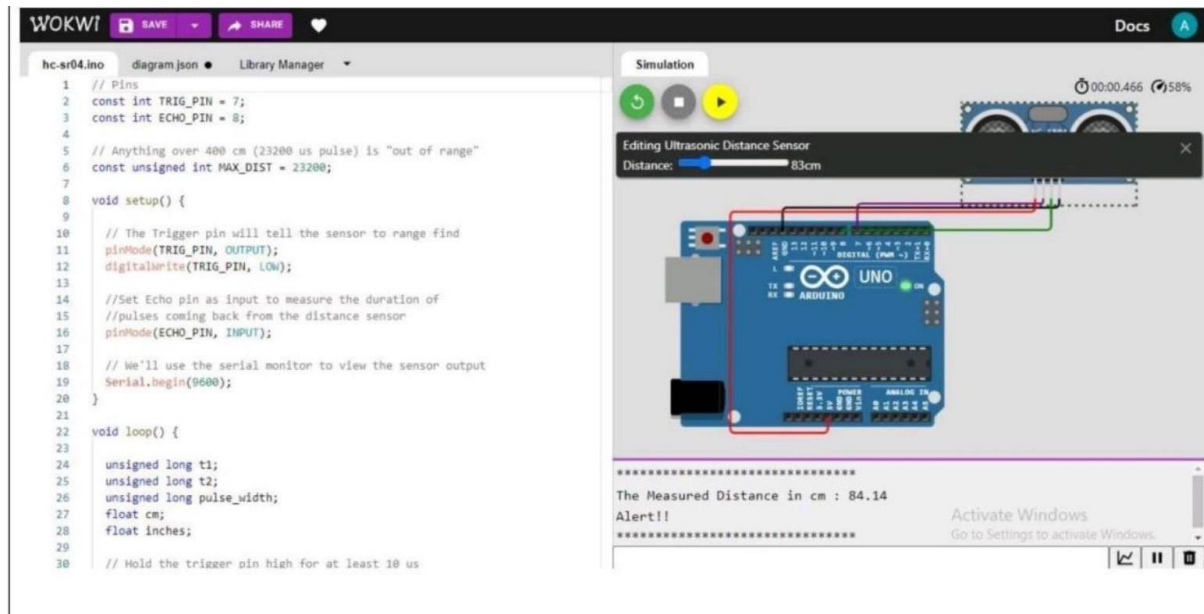
if( cm < 100 ){
    //while(true){
        Serial.println("Alert!!");
        //}
    }
Serial.print("*****");
}

//wait at least 1000ms before next measurement
Delay(1000);
}

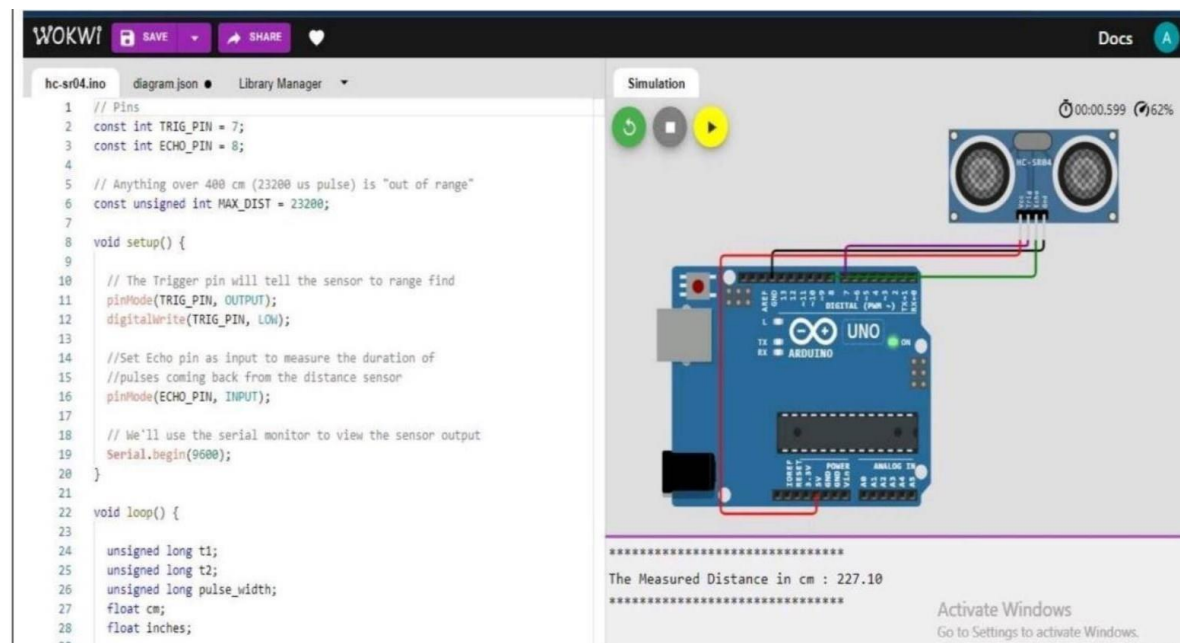
```

## Output:


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



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




### 3. Simulation and code execution




The Wokwi simulation interface shows a circuit with an Arduino Uno and an ultrasonic sensor. The sensor is connected to the Arduino's digital pins. The interface includes a 'Simulation' tab and a 'Code' tab. The 'Simulation' tab shows a play button and a plus button. The 'Code' tab shows the C++ code for the sensor.

```
1 // Pin
2 const int TRIG_PIN = 5;
3 const int ECHO_PIN = 6;
4
5 // Anything over 400 cm (13000 us pulse) is "out of range"
6 const unsigned int MAX_DIST = 2320;
7
8 void setup() {
9   // The trigger pin will still be used to trigger final
10   pinMode(TRIG_PIN, OUTPUT);
11   digitalWrite(TRIG_PIN, LOW);
12
13   // Set the pin as input to measure the duration of
14   // pulses coming back from the distance sensor
15   pinMode(ECHO_PIN, INPUT);
16
17   // We'll use the serial monitor to view the sensor output
18   Serial.begin(9600);
19
20   while (true) {
21     // Wait for pulse on echo pin
22     while (digitalRead(ECHO_PIN) == 0);
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
31     digitalWrite(TRIG_PIN, HIGH);
32     delayMicroseconds(10);
33     digitalWrite(TRIG_PIN, LOW);
34
35     // Wait for pulse on echo pin
36     while (digitalRead(ECHO_PIN) == 0);
37
38     // Measure how long the echo pin was held high (pulse width)
39     // in time, the distance sensor will operate after ~50 us.
40     t1 = micros();
41     while (digitalRead(ECHO_PIN) == 1);
42     t2 = micros();
43     pulse_width = t2 - t1;
44
45     // Calculate distance in centimeters and inches, the constants
46     // are found in the constants, and calculated from the assumed speed
47     // of sound in air at sea level (340 m/s).
48     cm = pulse_width / 58.8;
49     inches = pulse_width / 146.0;
50
51     // Print out results
52     if (pulse_width < MAX_DIST) {
53       Serial.println("Not out of range");
54     } else {
55       Serial.println("=====");
56       Serial.println("The Measured Distance in cm : ");
57       Serial.println(cm);
58
59       if (cm > 199) {
60         Serial.println("Alert it !!");
61       }
62       Serial.println("=====");
63     }
64
65     // Wait at least 100ms before next measurement
66     delay(100);
67   }
68 }
```



The Wokwi simulation interface shows the measured distance of 201.79 cm. The 'Editing Ultrasonic Distance Sensor' dialog box is open, showing the distance set to 199cm. The 'Simulation' tab shows a play button and a plus button. The 'Code' tab shows the C++ code for the sensor.



The Wokwi simulation interface shows the measured distance of 57.79 cm and an alert. The 'Simulation' tab shows a play button and a plus button. The 'Code' tab shows the C++ code for the sensor.