

TEAM ID:PNT2022TMID31318

1. Write Code and connections in wokwi for ultrasonic sensor. whatever distance is less than 100 cms 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 findPin
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!!");
        //}
    }

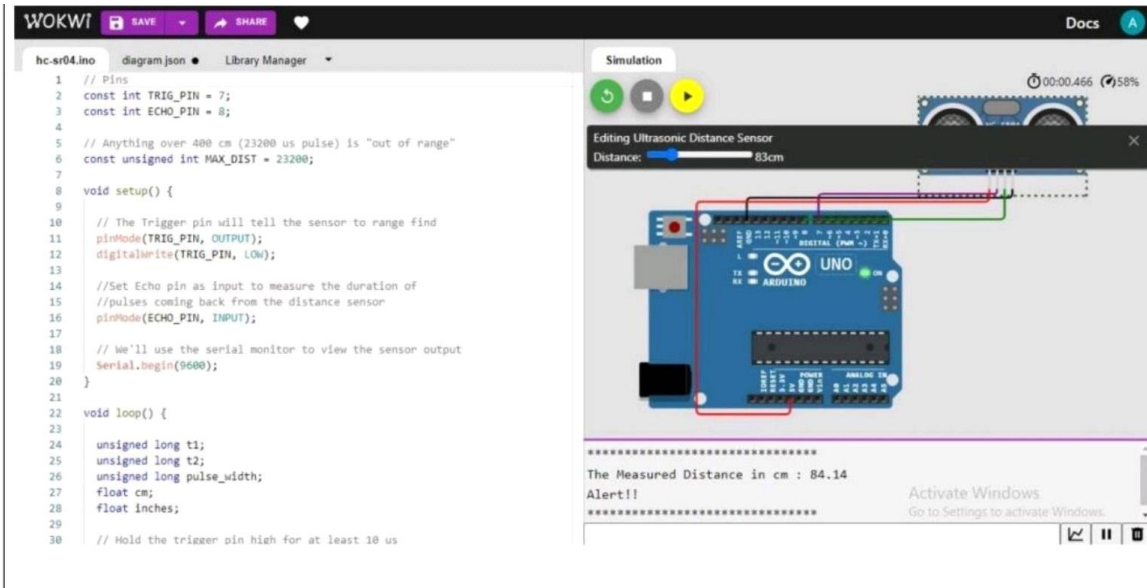
Serial.print("*****");
}

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

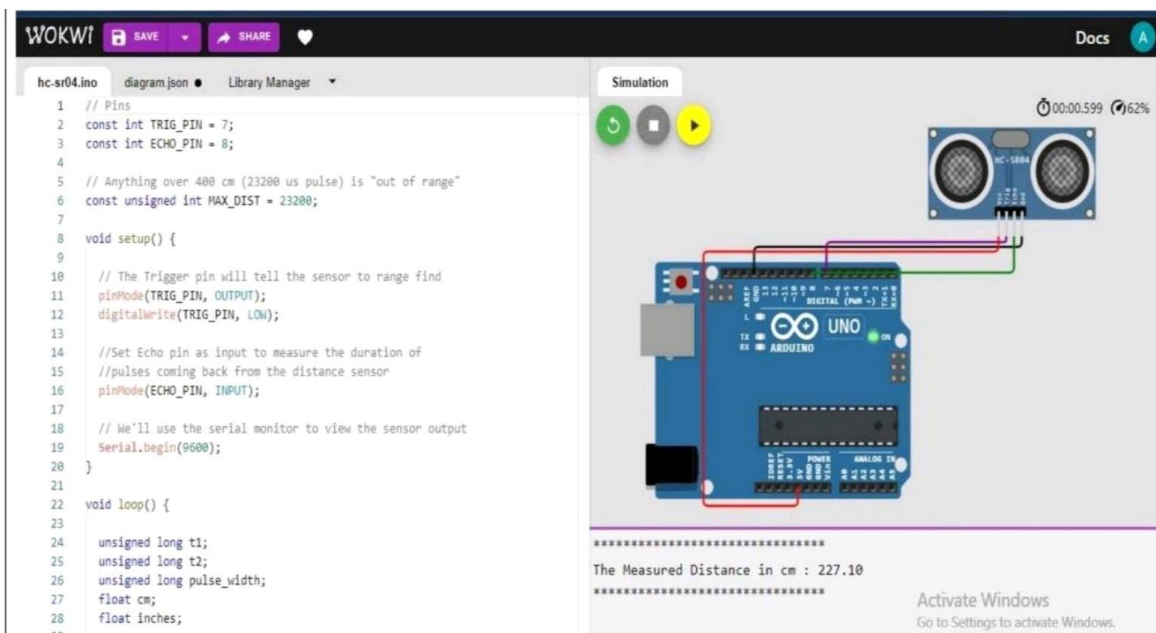
```

Output:

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



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



- Simulation and code execution

WOKWI

SHARE

Simulation

Code

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WOKWI

SHARE

Simulation

Code

```

1 // Pin
2 const int TRIG_PIN = 5;
3 const int ECHO_PIN = 4;
4
5 // Anything over 400 is (2000 us pulse) is "out of range"
6 const unsigned int MAX_DIST = 2000;
7
8 void setup() {
9   // The trigger pin will tell the sensor to range find
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 }
21
22 void loop() {
23   unsigned long t1;
24   unsigned long t2;
25   unsigned long pulse_width;
26   float cm;
27
28   // Hold the trigger pin high for at least 10 us
29   digitalWrite(TRIG_PIN, HIGH);
30   delayMicroseconds(10);
31   digitalWrite(TRIG_PIN, LOW);
32
33   // Wait for pulse to echo
34   while ( !digitalRead(ECHO_PIN) ) {}
35
36   // Measure how long the echo pin was held high (pulse width)
37   // Note: the Arduino monitor will overflow after ~18 ms
38   t1 = micros();
39   while ( !digitalRead(ECHO_PIN) ) {}
40   t2 = micros();
41   pulse_width = t2 - t1;
42
43   // Calculate distance in centimeters and inches. The constants
44   // we found in the datasheet, and calculated from the sound speed
45   // and used in our arduino code (148.03)
46   cm = pulse_width / 58.8;
47   inches = pulse_width / 148.0;
48
49   // Print our results
50   if ( pulse_width < MAX_DIST + 1 )
51     Serial.println("Out of range");
52   else {
53     Serial.print("=====");
54     Serial.print("The measured distance in cm : ");
55     Serial.println(cm);
56   }
57
58   // Show delay
59   delay(1000);
60   Serial.println("=====");
61   delay(1000);
62 }

```

WOKWI

SHARE

Simulation

Code

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00:00.266

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Editing Ultrasonic Distance Sensor

Distance:

```

*****
The Measured Distance in cm : 201.79
*****

```

WOKWI

SHARE

Simulation

Code

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00:00.300

48%

```

*****
The Measured Distance in cm : 57.79
Alert it !!
*****

```