

## IBM ASSIGNMENT- 4 TEAM

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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);

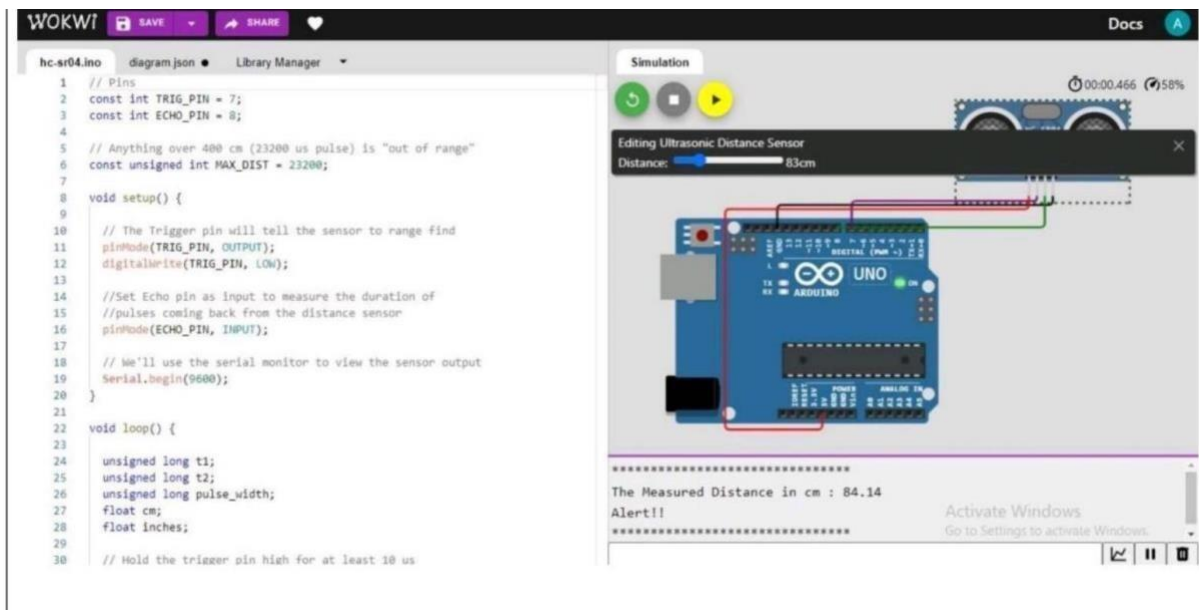
if( cm < 100 ){
    //while(true){
        Serial.println("Alert!!");
        //}
    }
Serial.print("*****");
}

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

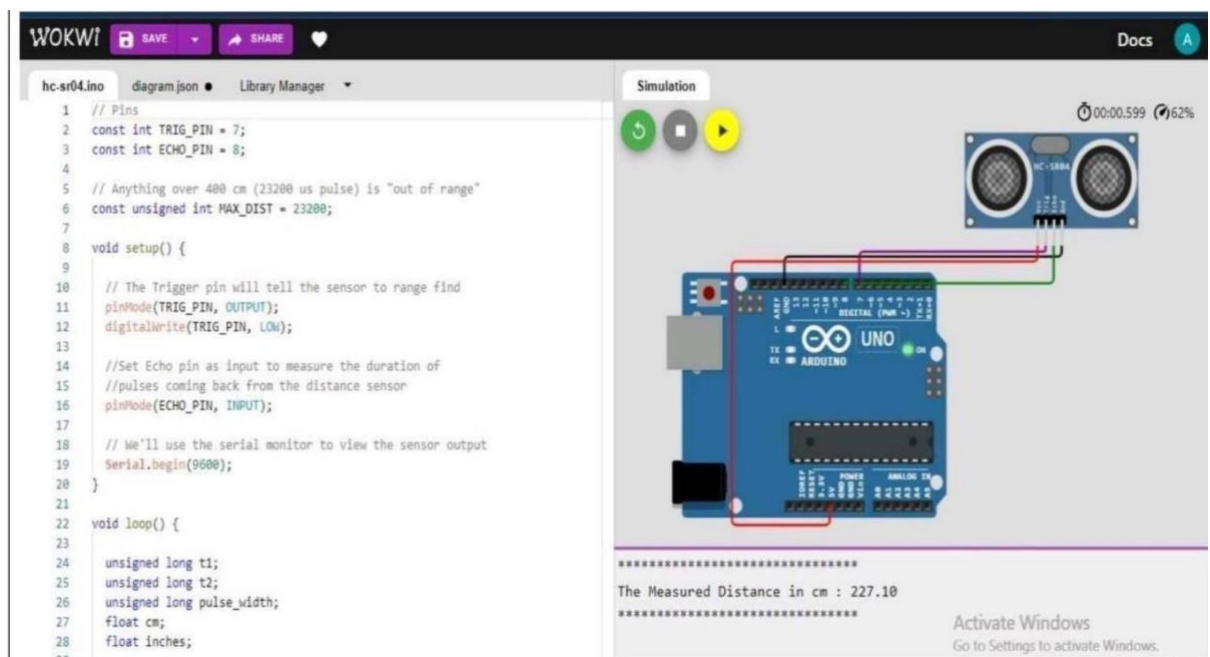
```

## Output:

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



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



3.Simulation and code execution



```

1 // Pin
2 const int TRIG_PIN = 5;
3 const int ECHO_PIN = 4;
4
5 // Anything over 400 cm (1200 inches) is "out of range"
6 const unsigned int MAX_DIST = 2000;
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 the pin we want 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
23 void loop() {
24
25   unsigned long t1;
26   unsigned long t2;
27   unsigned long pulse_width;
28   float cm;
29   float inches;
30
31 // Add the trigger pin high for at least 10 us
32 digitalWrite(TRIG_PIN, HIGH);
33 delayMicroseconds(10);
34 digitalWrite(TRIG_PIN, LOW);
35
36 // Wait for pulse on echo pin
37 while (digitalRead(ECHO_PIN) == 0) {
38   //
39 }
40 // Measure how long the echo pin was held high (pulse width)
41 // Now, the measured distance will overflow after ~10 m
42 t1 = micros();
43 while (digitalRead(ECHO_PIN) == 1) {
44   t2 = micros();
45   pulse_width = t2 - t1;
46
47 // Calculate distance in centimeters and inches. The constants
48 // are based in the equation, and calculated from the assumed speed
49 // of sound in air at sea level (340 m/s).
50 cm = pulse_width / 58.0;
51 inches = pulse_width / 148.0;
52
53 // Print out results:
54 if ( pulse_width < MAX_DIST ) {
55   Serial.println("Out of range");
56 } else {
57   Serial.println("*****");
58   Serial.println("The measured distance in cm : ");
59   Serial.println(cm);
60
61   if (cm > 100) {
62     Serial.println("Alert it !!");
63   }
64 }
65
66 Serial.println("*****");
67
68 // Wait at least 1000ms before next measurement
69 delay(1000);
70 }

```

