

# RAJALAKSHMI ENGINEERING COLLEGE

Department of Electronics and Communication Engineering

## IOT ASSIGNMENT

**Topic:** Assignment on home automation using Arduino

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**1. Write Code and connections in wokwi for ultrasonic sensor. whatever distance is less than 100cms 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 400cm (23200us
pulse) is "out of range" const unsigned int MAX_DIST = 2320
0;

void setup(){

//The Trigger pin will tell the sensor to range find Pin
Mode(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(E
CHO_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
  digitalWrite(TRIG_PIN,
  HIGH); delayMicroseconds(10); digitalWrite
  (TRIG_PIN, LOW);

  //Wait for pulse 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
  mint1 = micros ();
  while (digitalRead(ECHO_PIN) ==
  1); t2 = micros ();
  pulse_width = t2 - t1;

  //Calculate distance in centimeters and inches. The constants
  // are found in the data sheet, and calculated from the assumed speed
  // of sound in air at sea level (-

```

```

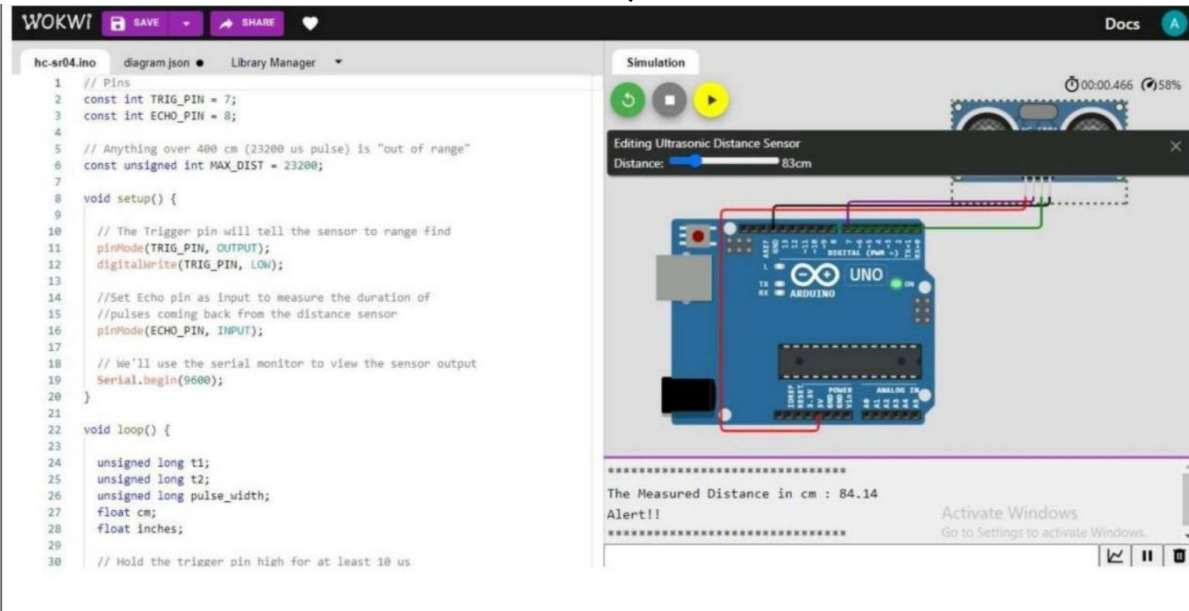
340m/s)cm=pulse_Width /58;
inches=pulse_width/148.0;
//Printout results
if (pulse_width >MAX _
DIST
){Serial.println("Outofrange
");
} else
{Serial.println("*****");Serial.pri
nt("The Measured Distance in cm: ");Serial.println(cm);

if( cm<100){
    //while(true){
        Serial.println("Alert!!");
        //}
    }
Serial.print("*****");
}
//wait at least 1000ms before next
measurementDelay(1000);
}

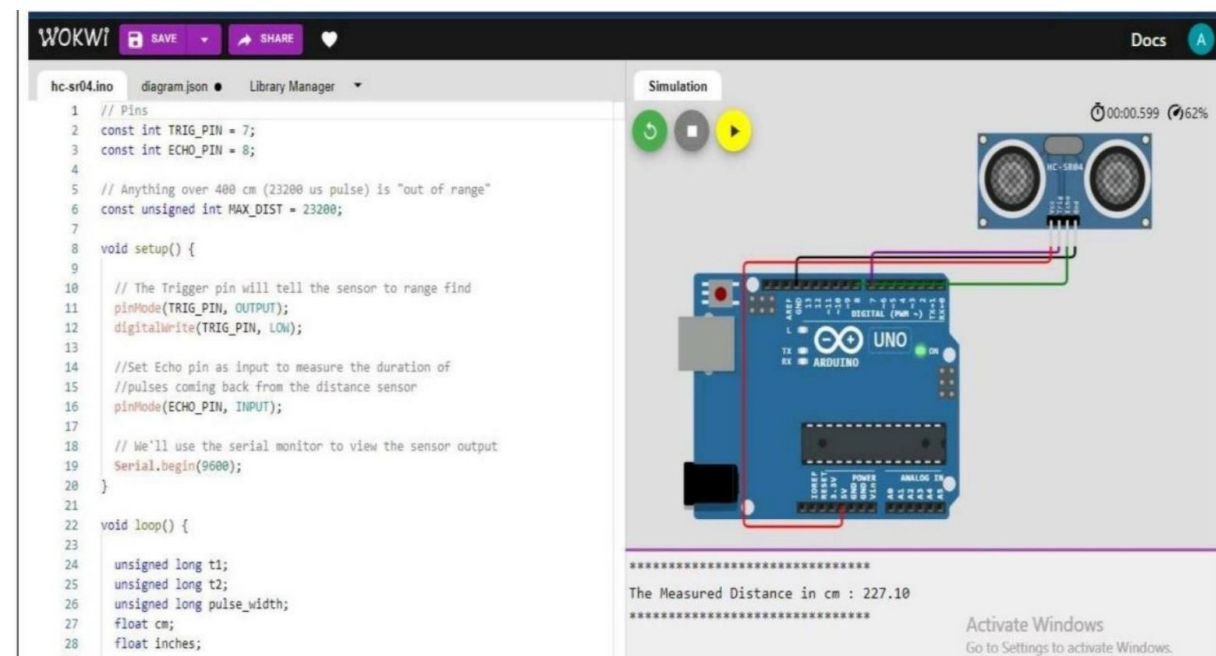
```

# Output:

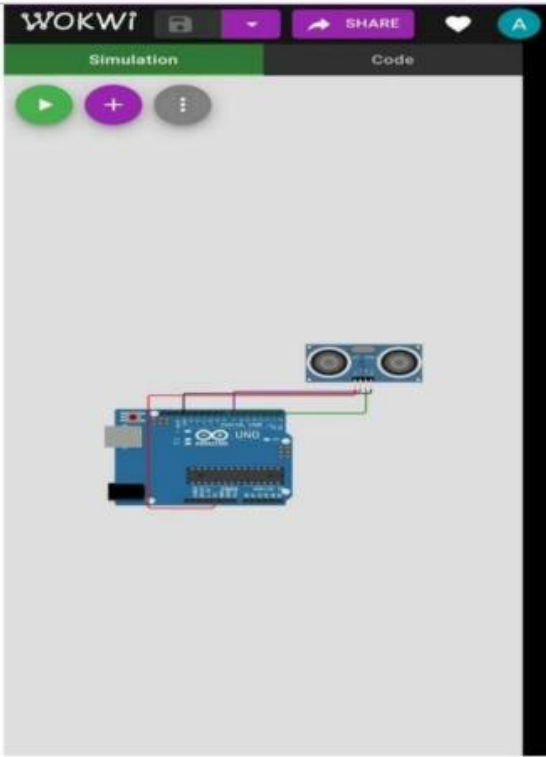
1.If the distance is less than 100cms,it alerts.



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



### 3.Simulation and code execution



WOKWI

Simulation Code

Distance: 199cm

The Measured Distance in cm : 201.79

```
1 // Pin
2 const int TRIG_PIN = 7;
3 const int ECHO_PIN = 8;
4
5 // Anything over 400 cm (13000 us) is out of range
6 const unsigned int MAX_DIST = 2300;
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  // the echo pin is 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 on echo pin
34   while (digitalRead(ECHO_PIN) == 0 );
35
36   // Measure how long the echo pin was held high (pulse width)
37   // Note: the Arduino's counter will overflow after ~50 ms
38   t1 = micros();
39   while ( digitalRead(ECHO_PIN) == 1);
40   t2 = micros();
41   pulse_width = t2 - t1;
42
43   // Calculate distance in centimeters and inches. The constants
44   // are found in the datasheet, and calculated from the sound speed
45   // and used in our old school pi/180 conv.
46   cm = pulse_width / 58.8;
47   inches = pulse_width / 146.8;
48
49   // Print out results
50   if ( pulse_width < MAX_DIST ) {
51     Serial.println("not of range");
52   } else {
53     Serial.println("=====");
54     Serial.println("The measured distance in cm : ");
55     Serial.println(cm);
56
57     if(cm < 100)
58       Serial.println("Alert it !!");
59   }
60   Serial.println("=====");
61
62   // Wait at least 100ms before next measurement
63   delay(100);
64 }
```

WOKWI

Simulation Code

Distance: 57.79

The Measured Distance in cm : 57.79

Alert it !!