

Assignment -4

Assignment Date	19 October 2022
Student Name	DHIVYA S
Student Roll Number	620319104006
Maximum Marks	2 Marks

Question:

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. Upload document with wokwi share link and images of IBM cloud.

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("*****");
}

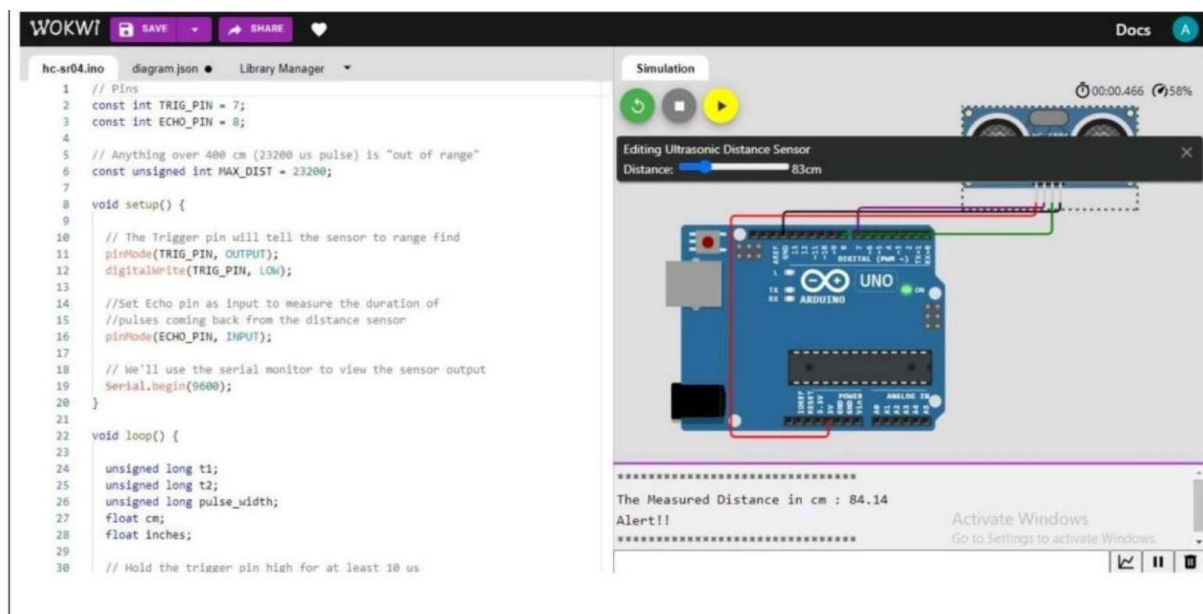
//wait at least 1000ms before next measurement

Delay(1000);
}

```

Output:

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



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

WOKWI

SAVE SHARE

hc-sr04.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
14 //Set Echo pin as input 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 void loop() {
23
24 unsigned long t1;
25 unsigned long t2;
26 unsigned long pulse_width;
27 float cm;
28 float inches;
```

Simulation

00:00.599 62%

HC-SR04

ARDUINO UNO

The Measured Distance in cm : 227.10

Activate Windows
Go to Settings to activate Windows.

3.Simulation and code execution

WOKWI

Simulation Code

Simulation

WOKWI

```
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
14 //Set Echo pin as input 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 void loop() {
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 // Note: the digitalWrite() command will overflow after ~18 ms
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 datasheet, and calculated from the assumed speed
47 // of sound in air at sea level (~340 m/s).
48 cm = pulse_width * 0.034;
49 inches = pulse_width * 0.0013;
50
51 // Print out results
52 if (pulse_width < MAX_DIST) {
53 Serial.println("Out of range");
54 } else {
55 Serial.println("The Measured Distance in cm : ");
56 Serial.println(cm);
57
58 if (inches) {
59 Serial.println("The Measured Distance in inches : ");
60 Serial.println(inches);
61 }
62 }
63
64 // Wait at least 100ms before next measurement
65 delay(100);
66 }
```

