

Assignment -4

Assignment Date	25 October 2022
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Maximum Marks	2 Marks

Question-1:

Write code and connections in wokwi for ultrasonic sensor. whenever distance is less than 100 cms send "alert" to ibm cloud and display in device recent events.

```
// 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
    pinMode(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(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 (~340
m/s). cm = pulse_width / 58.0;
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);
}

```

WOKWI SIMULATION:

Case 1: Distance less than 100 cm

```
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
```

Simulation

00:54.871 98%

Editing Ultrasonic Distance Sensor

Distance: 96cm

The Measured Distance in cm : 97.38

Alert!!

The Measured Distance in cm : 97.31

Alert!!

The Measured Distance in cm : 97.38

Case 2: Distance greater than 100 cms

```
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
```

Simulation

01:46.723 99%

Editing Ultrasonic Distance Sensor

Distance: 135cm

The Measured Distance in cm : 136.90

The Measured Distance in cm : 136.90

The Measured Distance in cm : 136.90

WOKWI LINK:

<https://wokwi.com/projects/346775395589161554>

IBM CLOUD:

The screenshot displays the IBM Watson IoT Platform interface. At the top, there's a navigation bar with "Browse", "Action", "Device Types", and "Interfaces". A user profile icon shows the name "akilaabeskarani0906@gmail.com" and ID "ID: jbbims". On the left, a sidebar contains icons for home, devices, users, settings, and analytics. The main panel has a tabbed interface with "Identity", "Device Information", "Recent Events" (selected), "State", and "Logs". Below the tabs, a message states: "The recent events listed show the live stream of data that is coming and going from this device." A table follows with columns: Event, Value, Format, and Last Received. It lists five "event_1" entries with varying distance values in JSON format, all received "a few seconds ago". At the bottom, pagination controls show "Items per page 50" and "1 - 1 of 1 item".

Event	Value	Format	Last Received
event_1	{"distance":41,"status":"alert"}	json	a few seconds ago
event_1	{"distance":71,"status":"alert"}	json	a few seconds ago
event_1	{"distance":31,"status":"alert"}	json	a few seconds ago
event_1	{"distance":20,"status":"alert"}	json	a few seconds ago
event_1	{"distance":45,"status":"alert"}	json	a few seconds ago