

ASSIGNMENT 4

Ultrasonic sensor simulation in Wokwi

Question :

Write a code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100cms send an "Alert" to IBM cloud and display in the device recent events.

Wokwi simulation link:

<https://wokwi.com/projects/290056311044833800>

Code:

```
1  #define ECHO_PIN 2
2  #define TRIG_PIN 3
3  #define organization = "g3mwba"
4  #define deviceType = "abcd"
5  #define deviceId = "16"
6  #define authMethod = "token"
7  #define authToken = "12345678"
8
9  void setup(){
10     Serial.begin(9600);
11     pinMode(TRIG_PIN,OUTPUT);
12     pinMode(ECHO_PIN,INPUT);
13 }
14
15 float readDistanceCM(){
16     digitalWrite(TRIG_PIN,LOW);
17     delayMicroseconds(2);
18     digitalWrite(TRIG_PIN,HIGH);
19     delayMicroseconds(10);
20     digitalWrite(TRIG_PIN,LOW);
21     int duration=pulseIn(ECHO_PIN,HIGH);
22     return duration*0.034/2;
23 }
24 void loop(){
```

```

25     float distance=readDistanceCM();
26     if(distance<=100)
27     {
28         Serial.println("person detected");
29     }
30     else{
31         Serial.print("Measured distance:");
32         Serial.println(readDistanceCM());
33     }
34     delay(1000);
35 }

```

IBM Cloud:

The screenshot displays the IBM Watson IoT Platform interface. The main section is titled "Browse Devices" and shows a table of devices. A modal window is open for configuring a device of type "ibm".

Device Table:

Device ID	Status	Device Type	Class ID	Date Added
11	Disconnected	ibm	Device	Oct 31, 2022

Recent Events Table:

Event	Value	Format	Last Received
event_1	{"randomNumber":97,"distance":101}	json	a few seconds ago
event_1	{"randomNumber":52,"distance":39}	json	a few seconds ago
event_1	{"randomNumber":29,"distance":61}	json	a few seconds ago
event_1	{"randomNumber":96,"distance":38}	json	a few seconds ago

Device Configuration Modal (Device Type: ibm):

- Events:** 1 (New event type button)
- Event type name:** event_1 (Send button)
- Schedule:** 20, Every Minute
- Payload:**

```

{
  1: "randomNumber": random(0, 100),
  2: "distance": random(0, 150),
  3: }
4:

```
- Buttons:** Upload a CSV file, Cancel, Save

Service Details - IBM Cloud

IBM Watson IoT Platform

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[https://g3mwba.internetofthings.ibmcloud.com/dashboard/devices/browse](#)

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IBM Watson IoT Platform

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Browse

Action

Device Types

Interfaces

Add Device

Browse Devices

All Devices

Diagnose

This table shows a summary of all devices that have been added. It can be filtered, organized, and searched on using different criteria. To get started, you can add devices by using the Add Device button, or by using API.

🔍 Search by Device ID

Device ID	Status	Device Type	Class ID	Date Added
11	Disconnected	ibm	Device	Oct 31, 2022

Identity

Device Information

Recent Events

State

Logs

Device ID

11

Device Type

ibm

Date Added

Oct 31, 2022 9:34 AM

Added By

613519106053@smartinternz.com

Connection Status

Disconnected

Items per page: 50

1-1 of 1 item

Device Type: ibm

Events 1

New event type

Event type name

event_1

Send

🗑️

Schedule

20

Every Minute

Payload

Specify the event payload in the editor window or by uploading a CSV file.

0 {

1 "randomNumber": random(0, 100)

2 "distance": random(0, 150)

3 }

4

Upload a CSV file

Cancel

Save

Service Details - IBM Cloud

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Server Not Found

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[https://g3mwba.internetofthings.ibmcloud.com/dashboard/boards/ba40bd26-9a31-46e6-8a2e-c3e9e10ebd42](#)

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ultrasonic

Line chart

150

100

50

0

10:21

10:21:30

1 minute

now

distance

Device Type: ibm

Events 1

New event type

Event type name

event_1

Send

🗑️

Schedule

20

Every Minute

Payload

Specify the event payload in the editor window or by uploading a CSV file.

0 {

1 "randomNumber": random(0, 100)

2 "distance": random(0, 150)

3 }

4

Upload a CSV file

Cancel

Save

Wokwi Simulation:

Wokwi Simulation Interface showing the code for an HC-SR04 ultrasonic distance sensor connected to an Arduino Uno.

Code (hc-sr04.ino):

```
1 #define ECHO_PIN 2
2 #define TRIG_PIN 3
3 #define organization = "g3muba"
4 #define deviceType = "abcd"
5 #define deviceId = "16"
6 #define authMethod = "token"
7 #define authToken = "12345678"
8
9 void setup(){
10   Serial.begin(9600);
11   pinMode(TRIG_PIN, OUTPUT);
12   pinMode(ECHO_PIN, INPUT);
13 }
14
15 float readDistanceCM(){
16   digitalWrite(TRIG_PIN, LOW);
17   delayMicroseconds(2);
18   digitalWrite(TRIG_PIN, HIGH);
19   delayMicroseconds(10);
20   digitalWrite(TRIG_PIN, LOW);
21   int duration=pulseIn(ECHO_PIN, HIGH);
22   return duration*0.034/2;
23 }
24
25 void loop(){
26   float distance=readDistanceCM();
27
28   if(distance<=100)
29     {
```

Simulation Output:

Measured distance:266.49
Measured distance:266.48
Measured distance:311.92
Measured distance:259.49
person detected
person detected
person detected

The simulation shows the sensor measuring distance and detecting a person when the distance is 100cm or less.