

## Assignment -4

Assignment Date	25 October 2022
Student Name	M. C. Aiswarya
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Maximum Marks	2 Marks

### Question-1:

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

Link: <https://wokwi.com/projects/346960582438552146>

The screenshot shows the Wokwi web IDE interface. On the left, the `sketch.ino` file is open, displaying the following code:

```

1  const int TRIG_PIN = 7;
2  const int ECHO_PIN = 8;
3
4  // Anything over 400 cm (5000 us pulse) is "out of range"
5  const unsigned int MAX_DIST = 5800;
6
7  void setup() {
8
9    pinMode(TRIG_PIN, OUTPUT);
10   digitalWrite(TRIG_PIN, LOW);
11   pinMode(ECHO_PIN, INPUT);
12   Serial.begin(9600);
13 }
14
15 #define ORG "qok20x"
16 #define DEVICE_TYPE "ultrasonic"
17 #define DEVICE_ID "12345"
18 #define TOKEN "10232002"
19
20 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
21 char pubTopic1[] = "iot-2/evt/status1/fmt/json";
22 char pubTopic2[] = "iot-2/cmd/test/fmt/string";
23 char authMethod[] = "use-token-auth";
24 char token[] = TOKEN;
25 char clientId[] = "id:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
26 void loop() {
27
28   unsigned long t1;
29   unsigned long t2;
30   unsigned long pulse_width;
31   float cm;
32   digitalWrite(TRIG_PIN, HIGH);
33   delayMicroseconds(10);
34   digitalWrite(TRIG_PIN, LOW);
35

```

On the right, the simulation shows an Arduino Uno board connected to an HC-SR04 ultrasonic sensor. The sensor's VCC pin is connected to the 5V pin on the Arduino, and its GND pin is connected to a GND pin. The TRIG pin is connected to digital pin 7, and the ECHO pin is connected to digital pin 8. The simulation output at the bottom shows the text "Alert" and "Alert".

The screenshot shows the Wokwi web IDE interface with the `diagram.json` file open. The JSON file defines the components and their connections:

```

1  {
2    "version": 1,
3    "author": "006- Aiswarya M C",
4    "editor": "wokwi",
5    "parts": [
6      { "type": "wokwi-arduino-uno", "id": "uno", "top": 45.33, "left": 0.67, "attrs": {} },
7      { "type": "wokwi-hc-sr04", "id": "ultrasonic1", "top": -85.7, "left": 44.67, "attrs": {} }
8    ],
9    "connections": [
10     [ { "ultrasonic1:TRIG", "uno:7", "green", [ "v29.9", "h63.66" ] },
11     [ { "ultrasonic1:ECHO", "uno:8", "gold", [ "v19.9", "h4.44", "v0.67", "h36" ] },
12     [ { "ultrasonic1:GND", "uno:GND.1", "black", [ "v37.9", "h1.21" ] },
13     [ { "ultrasonic1:VCC", "uno:5V", "red", [ "v19.24", "h-0.45", "v6", "h-132", "v230", "h176.67", "v-6.67" ] }
14   ]
15 }

```

The simulation on the right is identical to the one in the previous screenshot, showing the Arduino Uno connected to the HC-SR04 sensor with the same wiring and output.

IBM cloud:

Identity	Device Information	Recent Events	State	Logs
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The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
event_1	{"dist":286,"message":"alert"}	json	a few seconds ago
event_1	{"dist":89,"message":"in range"}	json	a minute ago
event_1	{"dist":78,"message":"in range"}	json	a minute ago