

## Assignment 4

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**Maximum Marks :** 2 Marks

**Project Name :** IoT based safety gadget for child  
safety monitoring notification

### 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.

### Code:

```
#include
<WiFi.h>
#include
<PubSubClient.h>
void callback(char* subscribetopic, byte* payload,
unsigned int payloadLength);
//-----credentials of IBM Accounts-----
#define ORG "kotoq5"//IBM ORGANITION ID
#define DEVICE_TYPE "ESP32"//Device type mentioned in ibm
watson IOT Platform#define DEVICE_ID "12345"//Device ID
mentioned in ibm watson IOT Platform #define TOKEN
"12345678" //Token
String data3;
```

```
char server[] = ORG  
".messaging.internetofthings.ibmcloud.com"; char  
publishTopic[] = "iot-2/evt/Data/fmt/json";  
char subscribetopic[] = "iot-  
2/cmd/test/fmt/String"; char  
authMethod[] = "use-token-auth";
```

```
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
WiFiClient wifiClient;
PubSubClient client(server, 1883, callback
,wifiClient);const int trigPin = 5;
const int echoPin
= 18;#define
SOUND_SPEED
0.034 long
duration;float
distance; void
setup() {
Serial.begin(11
5200);
pinMode(trigPin,
OUTPUT);
pinMode(echoPin,
INPUT);
wificonnect();
mqttconnect();
}
void loop()
{
digitalWrite(trigPin,
LOW);
delayMicroseconds(2);
digitalWrite(trigPin,
```

```
HIGH);  
delayMicroseconds(10);  
digitalWrite(trigPin,  
LOW); duration =  
pulseIn(echoPin, HIGH);  
distance = duration *  
SOUND_SPEED/2;  
Serial.print("Distance  
(cm): ");  
Serial.println(distance)  
; if(distance<100)  
{  
Serial.println("ALERT!!")  
; delay(1000);
```

```

PublishData(distance)
; delay(1000);
if
(!client.loop()
) {
mqttconnect();
}
}
delay(1000);
}
void PublishData(float
dist) {mqttconnect();
String payload =
"{\"Distance\":\""; payload
+= dist;
payload += "\",\"ALERT!!\":\"\"Distance less than
100cms\""; payload += "}";
Serial.print("Sending payload: ");
Serial.println(payload);

if (client.publish(publishTopic, (char*) payload.c_str())) {
Serial.println("Publish ok");
} else {
Serial.println("Publish failed");
}
}
void mqttconnect() {

```

```
if (!client.connected()) {  
  Serial.print("Reconnecting  
client to");  
  Serial.println(server);  
  while (!client.connect(clientId, authMethod, token)) {  
    Serial.print(".")  
    ; delay(500);  
  }  
}
```

```
initManagedDevice();
Serial.println();
}
}
void wificonnect()
{
Serial.println(); Serial.print("Connecting
to "); WiFi.begin("Wokwi-GUEST", "", 6);
while (WiFi.status() != WL_CONNECTED) {
delay(500);
Serial.print(".");
}
Serial.println("");
Serial.println("WiFi
connected"); Serial.println("IP
address: ");
Serial.println(WiFi.localIP());
}
void initManagedDevice() {
if (client.subscribe(subscribetopic)) {
Serial.println((subscribetopic));
Serial.println("subscribe to cmd OK");
} else {
Serial.println("subscribe to cmd FAILED");
}
}
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
{
Serial.print("callback invoked for topic: ");
```

```
Serial.println(subscribetopic);  
for (int i = 0; i < payloadLength; i++) {
```



```
//Serial.print((char)payload[i])
; data3 += (char)payload[i];
}
Serial.println("data: "+
data3); data3="";
}
```

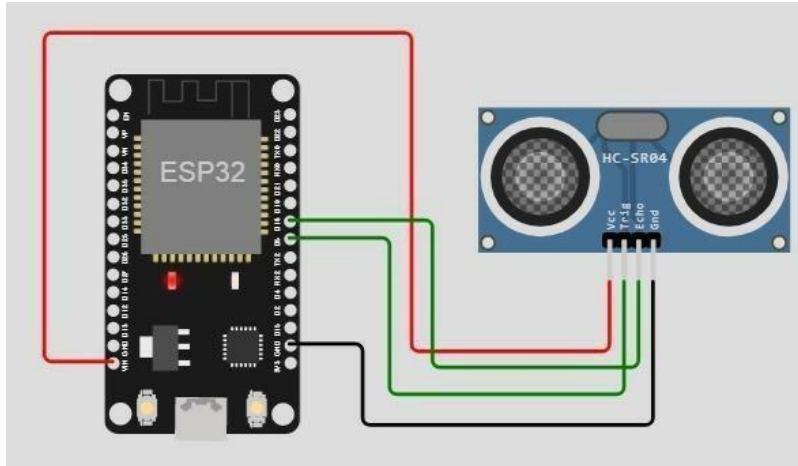
**Diagram.json:**

```
{
  "version": 1,
  "author":
  "sweetysharon",
  "editor":
  "wokwi",
  "parts": [
    { "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": -4.67, "left": -114.67,
      "attrs": {} },
    { "type": "wokwi-hc-sr04", "id": "ultrasonic1", "top": 15.96, "left": 89.17,
      "attrs": {} }
  ],
  "connections": [
    [ "esp:TX0", "$serialMonitor:RX", "", [] ],
    [ "esp:RX0",
      "$serialMonitor:TX", "", [] ], [
```

```
"esp:VIN",  
"ultrasonic1  
:VCC"  
, "red",  
[ "h-37.16", "v-178.79", "h200", "v173.33", "h100.67" ]  
],  
[ "esp:GND.1", "ultrasonic1:GND", "black", [ "h39.87", "v44.04", "h170" ] ],  
[ "esp:D5", "ultrasonic1:TRIG", "green", [ "h54.54", "v85.07", "h130.67" ] ],  
[ "esp:D18", "ultrasonic1:ECHO", "green", [ "h77.87", "v80.01", "h110" ] ]
```

```
]
}
```

## Circuit Diagram:



## Output:

output:

```
Connecting to ....
WiFi connected
IP address:
10.10.0.2
Reconnecting client to ytluse.messaging.internetofthings.ibmcloud.com
iot-2/cmd/test/fmt/String
subscribe to cmd OK

Distance (cm): 399.92
Distance (cm): 399.96
Distance (cm): 399.94
Distance (cm): 399.98
Distance (cm): 399.94
Distance (cm): 399.92
Distance (cm): 399.94
```

**IBM cloud output:**

**Browse**   Action   Device Types   Interfaces   Add Device +

---

**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	{"distance":7,"Alert":"","Distance less than 10"}	json	a few seconds ago
event_1	{"distance":9,"Alert":"","Distance less than 10"}	json	a few seconds ago
event_1	{"distance":8,"Alert":"","Distance less than 10"}	json	a few seconds ago
event_1	{"distance":9,"Alert":"","Distance less than 10"}	json	a few seconds ago