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PROJECT NAME	Sign with smart connectivity for better road safety
MARK	2 MARK

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.

Code:

```
#include <WiFi.h>
#include <PubSubClient.h> void callback(char*
subscribetopic, byte* payload, unsigned int
payloadLength);
//-----credentials of IBM Accounts-----#define
ORG "ge3f42"//IBM ORGANITION ID
#define DEVICE_TYPE "ESP32"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "3A-85-DD-94-7D-BC"//Device ID mentioned in ibm watson
IOT Platform #define TOKEN "sPNIlvo1-SQoK4Dhx8" //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(115200);
pinMode(trigPin,
OUTPUT);
pinMode(echoPin,
INPUT);
wificonnect();
mqttconnect();
} void
loop()
{
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(100);
PublishData(distance);
delay(100); if
(!client.loop()) {
mqttconnect();
} }
delay(100);
}
void PublishData(float dist) {
mqttconnect();
String payload = "{\"Distance\":";
payload += dist;
payload += ", \"ALERT!!\":"; payload += "\"Distance less than 100cms\"";
payload += "}";
Serial.print("Sending payload: ");
Serial.println(payload);

```

```

digitalWrite(trigPin, LOW);
delayMicroseconds(2);

```

```
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(100); } initManagedDevice();  
    Serial.println();  
  }  
}
```

```

void wificonnect()

Serial.println();
Serial.print("Connecting to ");
WiFi.begin("Wokwi-GUEST", "", 6);
while (WiFi.status() != WL_CONNECTED) {
  delay(100);
  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": -112.87, "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" ] ]
]
}

```

OUTPUT :

Wokwi

SAVE

SHARE

Docs

SIGN IN

sketch.ino

diagram.json

libraries.txt

Library Manager

1 # Wokwi Library List

2 # See <https://docs.wokwi.com/guides/libraries>

3

4 PubSubClient

Simulation

01:53.834 102%

Connecting to

WiFi connected

IP address:

10.10.0.2

Reconnecting client to ge3f42.messaging.internetofthings.ibmcloud.com

iot-2/cmd/test/fmt/String

ge3f42.internetofthings.ibmcloud.com/dashboard/devices/browse

IBM Watson IoT Platform

913019104009@smarterintenz.com

ID: ge3f42

Browse

Action

Device Types

Interfaces

Add Device

Search by Device ID

Device Simulator

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
3A-85-DD-94-7D-BC	Disconnected	ESP32	Device	Oct 31, 2022 1:40 PM	

Identity

Device Information

Recent Events

State

Logs

Showing Raw Data | No Interfaces Available

Property	Value	Type	Event	Last Received
Distance	399.94	Number	Data	a few seconds ago
ALERT!!	Distance less than 100cms	String	Data	a few seconds ago

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CIRCUIT DIAGRAM :

