

ASSIGNMENT 4

Date	04 November 2022
Team ID	PNT2022TMID38093
Project Name	Project -Hazardous Area Monitoring for industrial plant powered by IOT
Maximum Marks	4 Marks

Project Title: Hazardous Area Monitoring for industrial plant powered by IOT

Team ID:PNT2022TMID38093

QUESTION:

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.

CODE:

```
#include <WiFi.h>
#include
<PubSubClient.h>
void callback(char* subscribetopic, byte* payload,
unsigned int payloadLength);
//-----credentials of IBM Accounts-----
#define ORG "Ashfaq1824"//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(115200);
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("ALE
RT!!");
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.conne
ted())
{ Serial.print("Reconnecting client to ");
Serial.println(server);
while (!client.connect(clientId, authMethod, token)) {
Serial.pri
nt(".");
delay(50
0);
}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 {

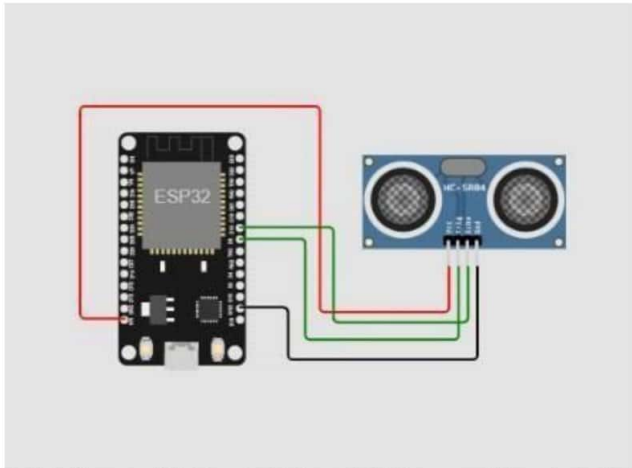
```

```

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="";
}

```

SCHEMATIC/CIRCUIT DIAGRAM:



IBM CLOUD OUTPUT:

Browse Action Device Types Interfaces Add Device +

Identity Device Information Recent Events State Logs

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

WOKWI LINK:

<https://wokwi.com/projects/322410731508073042>