**Assignment -4**

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| Assignment Date | 08 November 2022 |
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| Maximum Marks | 2 Marks |

**Question-1:** **Write code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events.**

**Soln:**

#include <WiFi.h>

#include <PubSubClient.h>

void callback(char\* subscribetopic, byte\* payload, unsigned int

payloadLength);

#define ORG "fo8tkk"

#define DEVICE\_TYPE "Wokwi"

#define DEVICE\_ID "21222122"

#define TOKEN "87654321"

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("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++) {

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" ] ]

  ]

}

WOKWI LINK:

<https://wokwi.com/projects/347678878108484179>

