Assignment -4

Data

Publish to IOT Device

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Question-1:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less 100 cms send “alert” to ibm cloud and display in device recent events.

Solution:

```
#include <WiFi.h>//library for wifi

#include <PubSubClient.h>//library for MQtt


void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);


//-------credentials of IBM Accounts------


#define ORG "rdegyk"//IBM ORGANITION ID

#define DEVICE_TYPE "weather1 "//Device type mentioned in ibm watson IOT Platform

#define DEVICE_ID "weather1 "//Device ID mentioned in ibm watson IOT Platform

#define TOKEN " _oa-3bajxqvCrO(6kW " //Token

String data3; float dist;


//-------- Customise the above values -------char server[] = ORG

".messaging.internetofthings.ibmcloud.com";// Server Name

char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of event perform and format in which data to be send

char subscribetopic[] = "iot-2/cmd/test/fmt/String";// cmd REPRESENT command type AND COMMAND IS TEST OF FORMAT STRING char authMethod[] = "use-token-auth";//
authentication method

char token[] = TOKEN; char clientId[] = "d:" ORG ":" DEVICE_TYPE

":" DEVICE_ID;//client id


//----------------------------------------
```

WiFiClient wifiClient; // creating the instance for wificlient

PubSubClient client(server, 1883, callback ,wifiClient); //calling the predefined client id by passing parameter like server id,portand wificredential

```
int LED = 4;
int trig = 5;
int echo = 18;
void setup()
{
Serial.begin(115200);
pinMode(trig,OUTPUT);
pinMode(echo,INPUT);
pinMode(LED, OUTPUT);
delay(10); wificonnect();
mqttconnect();
}
void loop()// Recursive Function
{
digitalWrite(trig,LOW);
digitalWrite(trig,HIGH);
delayMicroseconds(10);
digitalWrite(trig,LOW); float
dur = pulseIn(echo,HIGH); float
dist = (dur * 0.0343)/2;
Serial.print ("Distancein cm");
Serial.println(dist);
PublishData(dist);
delay(1000); if
(!client.loop()) {
mqttconnect();
}
}
/*.....retrieving to Cloud.....*/
```

```
void PublishData(float dist) {
 mqttconnect();//function call for connecting to ibm  /* creating
the String in in form JSon to update the data to ibm  cloud
 */ String
 object; if
(dist <100)
 {
 digitalWrite(LED,HIGH);
Serial.println("object is near");
 object = "Near";
 }
 else
 {
 digitalWrite(LED,LOW);
Serial.println("no object found");
 object = "No";
 }
 String payload = "{\"distance\":";
 payload += dist; payload += ","
"\"object\":\""; payload +=
 object; payload += "\"}";
 Serial.print("Sending payload: ");
Serial.println(payload); if (client.publish(publishTopic,
 (char*) payload.c_str())) {
 Serial.println("Publish ok");// if it sucessfully upload data on the cloud then it will print publish ok
in Serial monitor or else it will print publish failed
 } 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() //function defination for wificonnect
{
 Serial.println();
 Serial.print("Connecting to ");
 WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to establish the connection
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];

 }

data3="";

}
```

Reference:

https://wokwi.com/projects/347311168141918803