#### **ASSIGNMENT - 4**

Date	27 October 2022
Team ID	PNT2022TMID51678
Name	SMART SOLUTIONS FOR RAILWAY SYSTEMS -IOT
Maximum Marks	2 Marks

## **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:

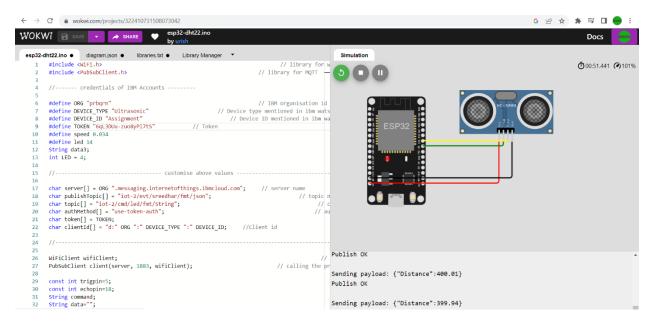
```
#include <WiFi.h>
                                                   // library for wifi
                                                   // library for MQTT
#include < PubSubClient.h>
//----- credentials of IBM Accounts ------
#define ORG "prbqrn"
                                                // IBM organisation id
#define DEVICE_TYPE "Ultrasonic"
                                               // Device type mentioned in ibm watson iot platform
#define DEVICE_ID "Assignment"
                                                // Device ID mentioned in ibm watson iot platform
#define TOKEN "6qL3DUu-zuo8yPl7tS"
                                            // Token
#define speed 0.034
#define led 14
String data3;
int LED = 4;
//------ customise above values ------
char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; // server name
char publishTopic[] = "iot-2/evt/sreedhar/fmt/json";
                                                                // topic name and type of event perform and format in which data
to be send
char topic[] = "iot-2/cmd/led/fmt/String";
                                                               // cmd Represent type and command is test format of strings
char authMethod[] = "use-token-auth";
                                                                // authentication method
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID; //Client id
WiFiClient wifiClient;
                                                          // creating instance for wificlient
PubSubClient client(server, 1883, wifiClient);
                                                          // calling the predefined client id by passing parameter like server
id,port and wifi credential
const int trigpin=5;
const int echopin=18;
String command;
String data="";
long duration;
float dist:
void setup()
 Serial.begin(115200);
 pinMode(led, OUTPUT);
 pinMode(trigpin, OUTPUT);
 pinMode(echopin, INPUT);
 wifiConnect();
```

```
mqttConnect();
}
void loop() {
 bool isNearby = dist < 100;
 digitalWrite(led, isNearby);
 publishData();
 delay(500);
 if (!client.loop())
  mqttConnect();
                                                                     // function call to connect to ibm
                      -----*/
void wifiConnect()
 Serial.print("Connecting to ");
 Serial.print("Wifi");
WiFi.begin("Wokwi-GUEST", "", 6);
 while (WiFi.status() != WL_CONNECTED)
  delay(500);
  Serial.print(".");
 Serial.print("WiFi connected, IP address: ");
 Serial.println(WiFi.localIP());
void mqttConnect()
 if (!client.connected())
  Serial.print("Reconnecting MQTT client to ");
  Serial.println(server);
  while (!client.connect(clientId, authMethod, token))
    Serial.print(".");
   delay(500);
  initManagedDevice();
  Serial.println();
void initManagedDevice() {
  if (client.subscribe(topic))
  Serial.println("IBM subscribe to cmd OK");
 }
 else
  Serial.println("subscribe to cmd FAILED");
 }
void publishData()
 digitalWrite(trigpin,LOW);
 digitalWrite(trigpin,HIGH);
 delayMicroseconds(10);
 digitalWrite(trigpin,LOW);
 duration=pulseIn(echopin,HIGH);
 dist=duration*speed/2;
 if(dist<100)
  digitalWrite(LED,HIGH);
  String payload = "{\"Alert Distance\":";
```

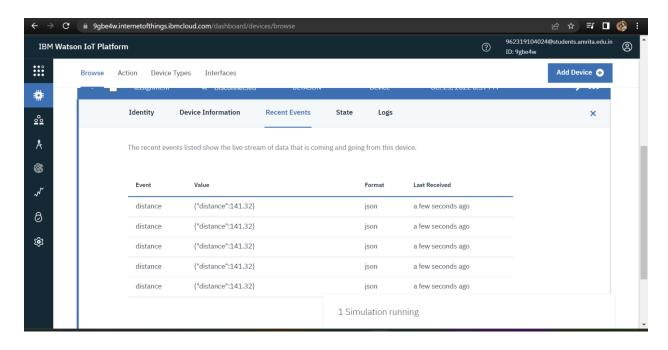
```
payload += dist;
  payload += "}";
  \textbf{Serial}.print("\n");
  Serial.print("Sending payload: ");
  Serial.println(payload);
  if (client.publish(publishTopic, (char*) payload.c_str())) // if data is uploaded to cloud successfully,prints publish ok else prints
publish failed
    Serial.println("Publish OK");
  if(dist>100)
     digitalWrite(LED,HIGH);
     String payload = "{\"Distance\":";
     payload += dist;
     payload += "}";
  Serial.print("\n");
  Serial.print("Sending payload: ");
  Serial.println(payload);
  if(client.publish(publishTopic, (char*) payload.c_str()))
   Serial.println("Publish OK");
  else
    digitalWrite(LED,LOW);
   Serial.println("Publish FAILED");
 }
 }
```

# **OUTPUT:**

#### Code simulation on wokwi



# Data sent to IBM Cloud with distance



<u>Link</u>: https://wokwi.com/projects/346676889639715411