ASSIGNMENT - 4

Date	03 November 2022
Team ID	PNT2022TMID22120
Name	SMARTFARMER - IoT ENABLED SMART FARMING APPLICATIONS

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

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

#define ORG "rwazv5"                // IBM organisation id
#define DEVICE_TYPE "NodeRed" // Device type mentioned in ibm watson iot platform
#define DEVICE_ID "12345"       // Device ID mentioned in ibm watson iot platform
#define TOKEN "vC@S3TBre6(97jAOJ_"            // 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
```

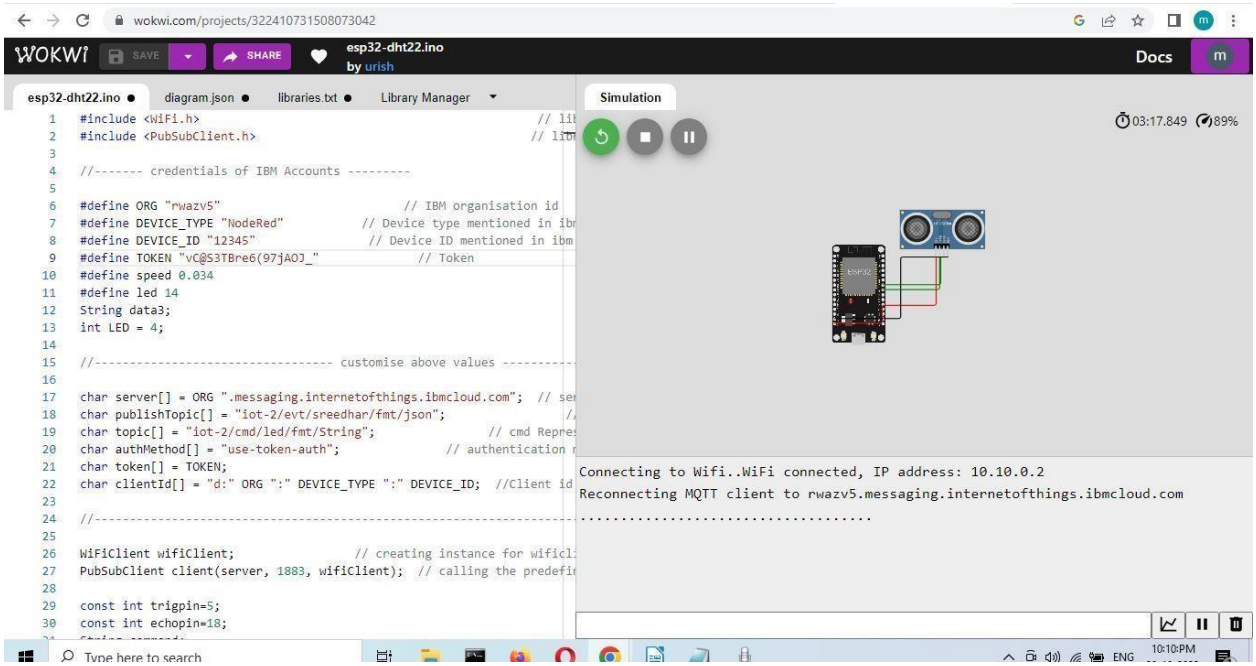
```
char topic[] = "iot-2/cmd/led/fmt/String";              // cmd Represent type and
command is test format of
strings
char authMethod[] = "use-token-auth";              // authentication method char
token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;  //Client id

//-------------------------------------------------------------------------------------------
----------------

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(11520
0);     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
 }
}

/* ------------------------------------------------retrieving to cloud----------------------------
------------------------*/

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 += "}";

 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 :



Data sent to IBM Cloud with distance