ASSIGNMENT - 4

Date	03 November 2022
Team ID	PNT2022TMID04665
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(115200);
pinMode(led, OUTPUT);
pinMode(trigpin,
OUTPUT);
pinMode(echopin,
INPUT); wifiConnect();
mqttConnect();
}

void loop() { bool isNearby
=     dist     <
      100;
digitalWrite(led,
isNearby);

 publishDa
ta();
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,L
OW);
digitalWrite(trigpin,HI
GH);
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
```

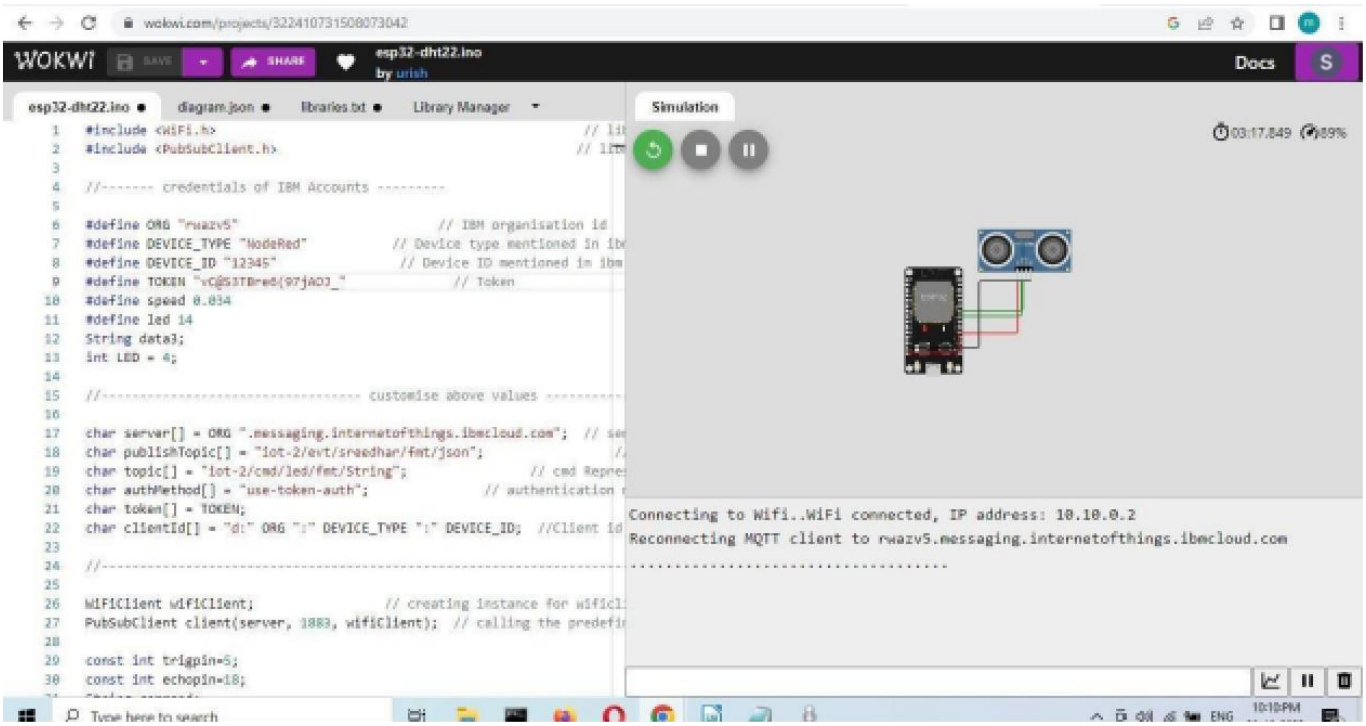
```
{
 Serial.println("Publish OK");
 }
 }
 if(dist>100)
 {
 digitalWrite(LED,HIGH);
 String payload =
"{\"Distance\":"; payload +=
dist;
 payload += "}";

 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 :

Code simulation on wokwi



Data sent to IBM Cloud with distance