ASSIGNMENT - 4

Date	27 October 2022
Team ID	PNT2022TMID51648
Name	SMART SOLUTIONS FOR RAILWAYS - 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 :

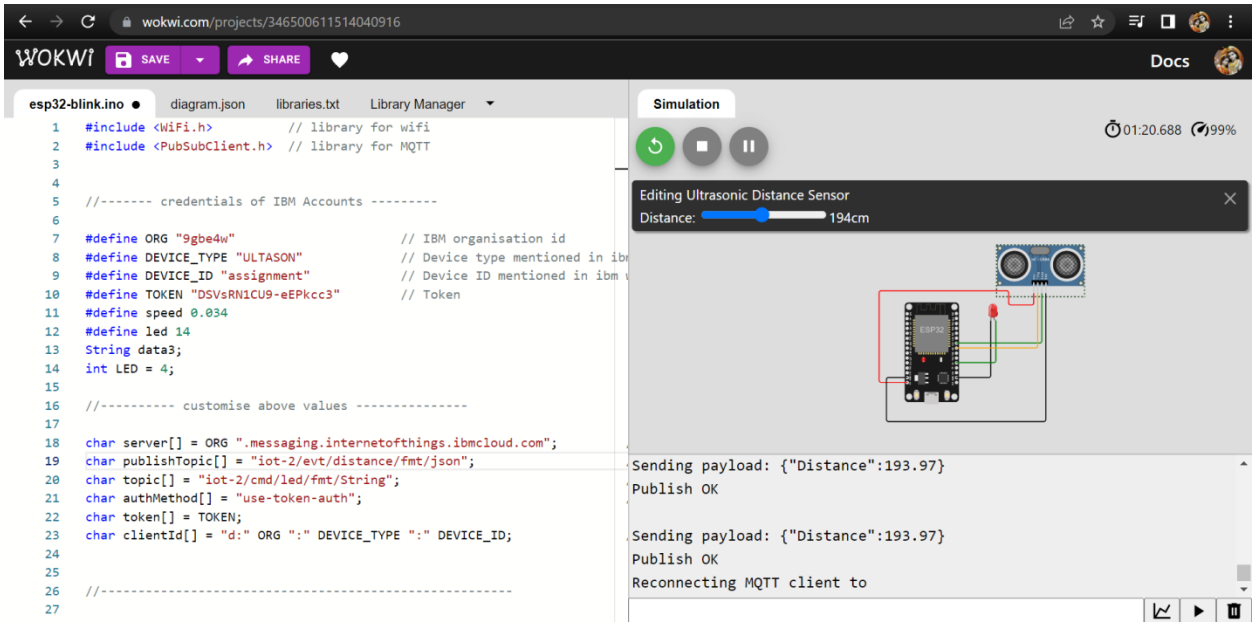
```
#include <WiFi.h>                                   // library for wifi
#include <PubSubClient.h>                           // library for MQTT

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

#define ORG "8hcf5x"                                // IBM organisation id
#define DEVICE_TYPE "ULTASON"                       // Device type mentioned in ibm watson iot platform
#define DEVICE_ID "assignment"                      // Device ID mentioned in ibm watson iot platform
#define TOKEN "DSVsRN1CU9-eEPkcc3"                  // 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
  }
}

/* ----------------------------------------------------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 :

Code simulation on wokwi



Data sent to IBM Cloud with distance