ASSIGNMENT 4

| Assignment Date | 01 November 2022 |
|-----------------|------------------|
| Student Name | Gokul vigneesh S |
| Maximum Marks | 2 Marks |
| Team ID | PNT2022TMID17444 |

Question:

Write code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events. Upload document with wokwi share link and images of IBM cloud.

Code:

```
#include <WiFi.h>
#include <WiFiClient.h>
#include <PubSubClient.h>
const int trigPin = 27;
const int echoPin = 26;
//define sound speed in cm/uS
#define SOUND_SPEED 0.034
#define CM_TO_INCH 0.393701
long duration;
float distanceCm;
float distanceInch;
void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);
 //----credentials of IBM Accounts-----
#define ORG "z22obn"//IBM ORGANITION ID
#define DEVICE_TYPE "Assignment-ibm"//Device type mentioned in ibm watson IOT
Platform
#define DEVICE_ID "Sensor"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "12345678"
                            //Token
String data3;
//----- 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);
void setup() {
 Serial.begin(115200); // Starts the serial communication
 pinMode(trigPin, OUTPUT); // Sets the trigPin as an Output
 pinMode(echoPin, INPUT); // Sets the echoPin as an Input
 Serial.println();
 wificonnect();
 mqttconnect();
}
void loop() {
 // Clears the trigPin
 digitalWrite(trigPin, LOW);
 delayMicroseconds(2);
 // Sets the trigPin on HIGH state for 10 micro seconds
 digitalWrite(trigPin, HIGH);
 delayMicroseconds(10);
 digitalWrite(trigPin, LOW);
 // Reads the echoPin, returns the sound wave travel time in microseconds
 duration = pulseIn(echoPin, HIGH);
  // Calculate the distance
 distanceCm = duration * SOUND SPEED/2;
```

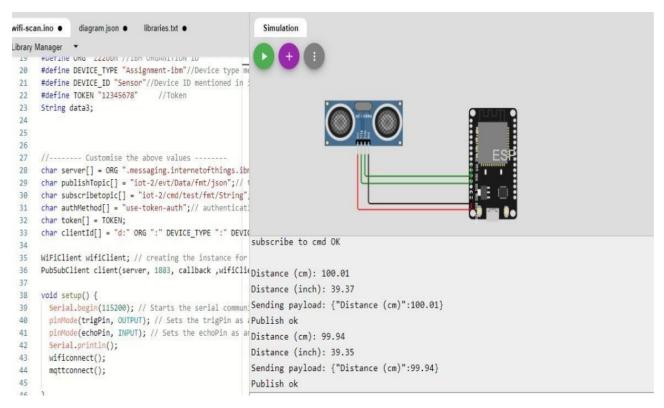
```
// Convert to inches
 distanceInch = distanceCm * CM_TO_INCH;
  // Prints the distance in the Serial Monitor
 Serial.print("Distance (cm): ");
 Serial.println(distanceCm);
 Serial.print("Distance (inch): ");
  Serial.println(distanceInch);
 PublishData(distanceCm);
 delay(1000);
  if (!client.loop()) {
   mqttconnect();
 }
}
 void PublishData(float Cm) {
 mqttconnect();//function call for connecting to ibm
  /*
     creating the String in in form JSon to update the data to ibm cloud
  */
 String payload = "{\"Distance (cm)\":";
 payload += Cm;
 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];
    }
}</pre>
```

Output:



IBM Cloud Alert:

| Value | Format | Last Received |
|-------------------------|--|--|
| {"Distance (cm)":99.98} | json | a few seconds ago |
| {"Distance (cm)":99.96} | json | a few seconds ago |
| {"Distance (cm)":99.98} | json | a few seconds ago |
| {"Distance (cm)":99.98} | json | a few seconds ago |
| {"Distance (cm)":99.98} | json | a few seconds ago |
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Link:

https://wokwi.com/projects/305569599398609

