Assignment - 4

Register Number	211419106166
Team ID	PNT2022TMID01099

Question-1:

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

Program:

```
#include <WiFi.h>
#include
<PubSubClient.h>
WiFiClientwifiClient;
String data3;

#define ORG "v6wg8x"
#define DEVICE_TYPE
```

```
"nodeMcu" #define
DEVICE_ID "NodeMCU"
#define TOKEN
"123456789"
#define speed 0.034
#define led 14

void callback(char* topic, byte*
playload, unsigned
intpayloadLength);
```

```
char server[] = ORG
".messaging.internetofthings.ibmcloud.
com"; char publishTopic[] = "iot-
2/evt/Data/fmt/json";
char topic[] = "iot-
2/cmd/test/fmt/String"; char
authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":"
DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883,
callback , wifiClient);
void publishData();
```

```
constinttrigpin=
5;
constintechopin=
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();
 }
}

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);
```

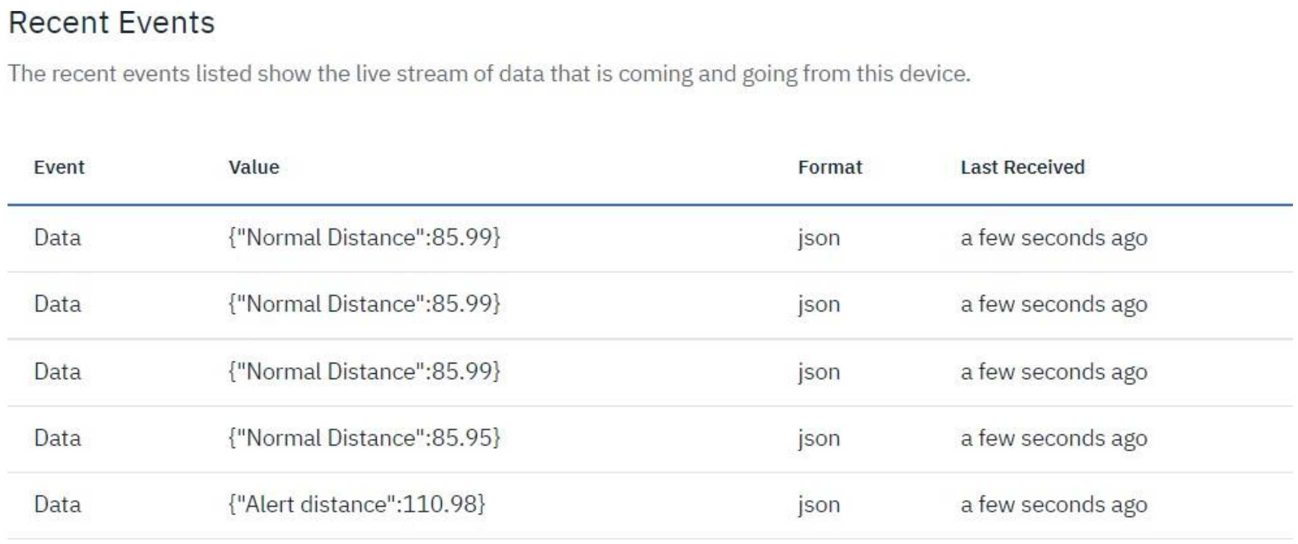
```
  while (!client.connect(clientId,
  authMethod,
token))
{ Serial.prin
t(".");
   delay(500);
  }
initManagedDevi
ce();
Serial.println();
 }
}


void
 initManagedDevice()
 { if
 (client.subscribe(topic)
 ) {
  //
Serial.println(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){
  String payload = "{\"Normal
  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");
   }


  }
   if(dist>101 &&dist<111){
   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())) {
Serial.println("Warning crosses
110cm -- it automaticaly of the
loop"); digitalWrite(led,HIGH);
  }else {
Serial.println("Publish FAILED");
  }
```

```
 }



 }
 void callback(char*
subscribeTopic, byte* payload,
unsigned intpayloadLength){
```

```
Serial.print("callback invoked for
topic:");
Serial.println(subscribeTopi
c); for(inti=0;
i<payloadLength; i++){ dist
+= (char)payload[i];
 }
Serial.println("data:"+
data3);
if(data3=="lighton"){ Serial.
println(data3);
digitalWrite(led,HIGH);
 }
 data3="";
}
```

Output:



Recent Events

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Data	{"Normal Distance":85.99}	json	a few seconds ago
Data	{"Normal Distance":85.99}	json	a few seconds ago
Data	{"Normal Distance":85.99}	json	a few seconds ago
Data	{"Normal Distance":85.95}	json	a few seconds ago
Data	{"Alert distance":110.98}	json	a few seconds ago

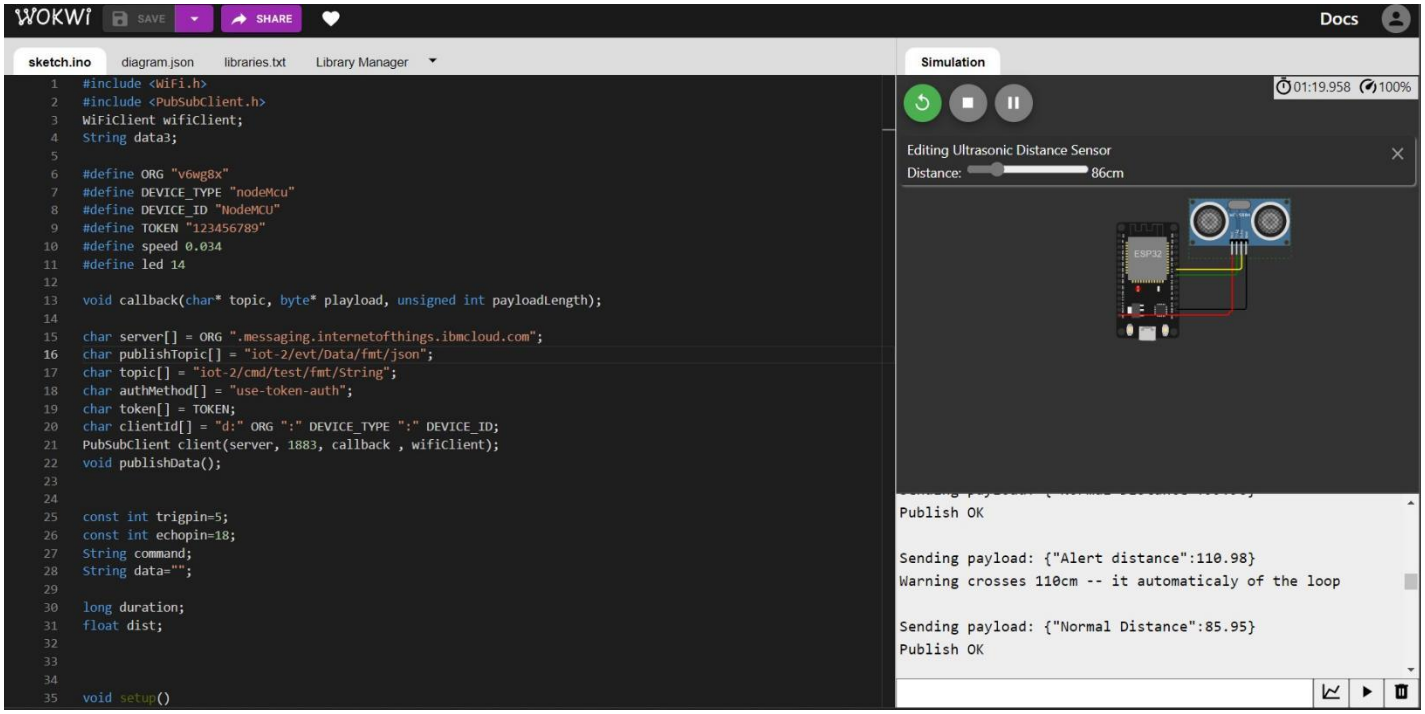
```
Sending payload: ('Normal Distance‶:9s. g)
Publish OK

Sending payload: ('Normal Distance‶:9s. g)
Publish OK

Sending payload: {'Alert distance":UB.98}
Warning crosses 110cm -- it automaticaly of the loop

Sending payload: ('Normal Distance‶:85.95}
Publish OK
```

connected

Connection Information

Basic connection information about this device.

Device ID	NodeMCU
Device Type	nodeMcu
Date Added	Nov 1, 2022 7:27 PM
Added By	312319104058@smartinternz.com
Connection Status	Disconnected Last Connected: Nov 1, 2022 7:58 PN Client Address: 145.40.94.93 Insecure Duration: a few seconds Data Transferred: 1.5 KB



```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;

#define ORG "v6wg8x"
#define DEVICE_TYPE "nodeMcu"
#define DEVICE_ID "NodeMCU"
#define TOKEN "123456789"
#define speed 0.034
#define led 14

void callback(char* topic, byte* playload, unsigned int payloadLength);

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Data/fmt/json";
char topic[] = "iot-2/cmd/test/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, callback , wifiClient);
void publishData();


const int trigpin=5;
const int echopin=18;
String command;
String data="";

long duration;
float dist;



void setup()
```

Editing Ultrasonic Distance Sensor
Distance: 86cm

```
Publish OK

Sending payload: {"Alert distance":110.98}
Warning crosses 110cm -- it automaticaly of the loop

Sending payload: {"Normal Distance":85.95}
Publish OK
```