Assignment -4

Assignment Date	2 Nov 2022
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Question-1:

Write code and connections in wokwifor 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>
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()
{
  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.print(".");
      delay(500);
    }
    initManagedDevice();
    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 int payloadLength){
 Serial.print("callback invoked for topic:");
Serial.println(subscribeTopic);   for(int i=0;
i<payloadLength; i++){
   dist += (char)payload[i];
 }
 Serial.println("data:"+ data3);
if(data3=="lighton"){
Serial.println(data3);
   digitalWrite(led,HIGH);
 }
 data3="";
}
```

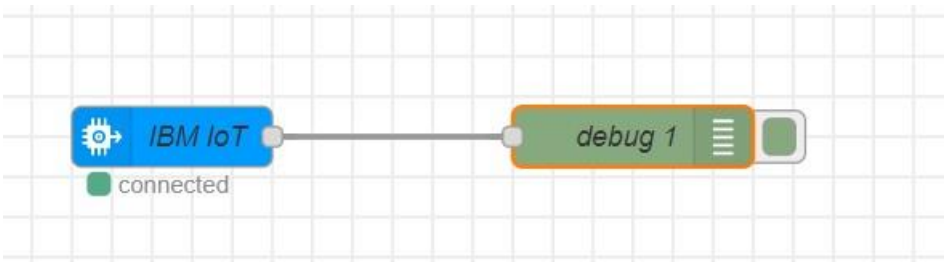
Output:

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

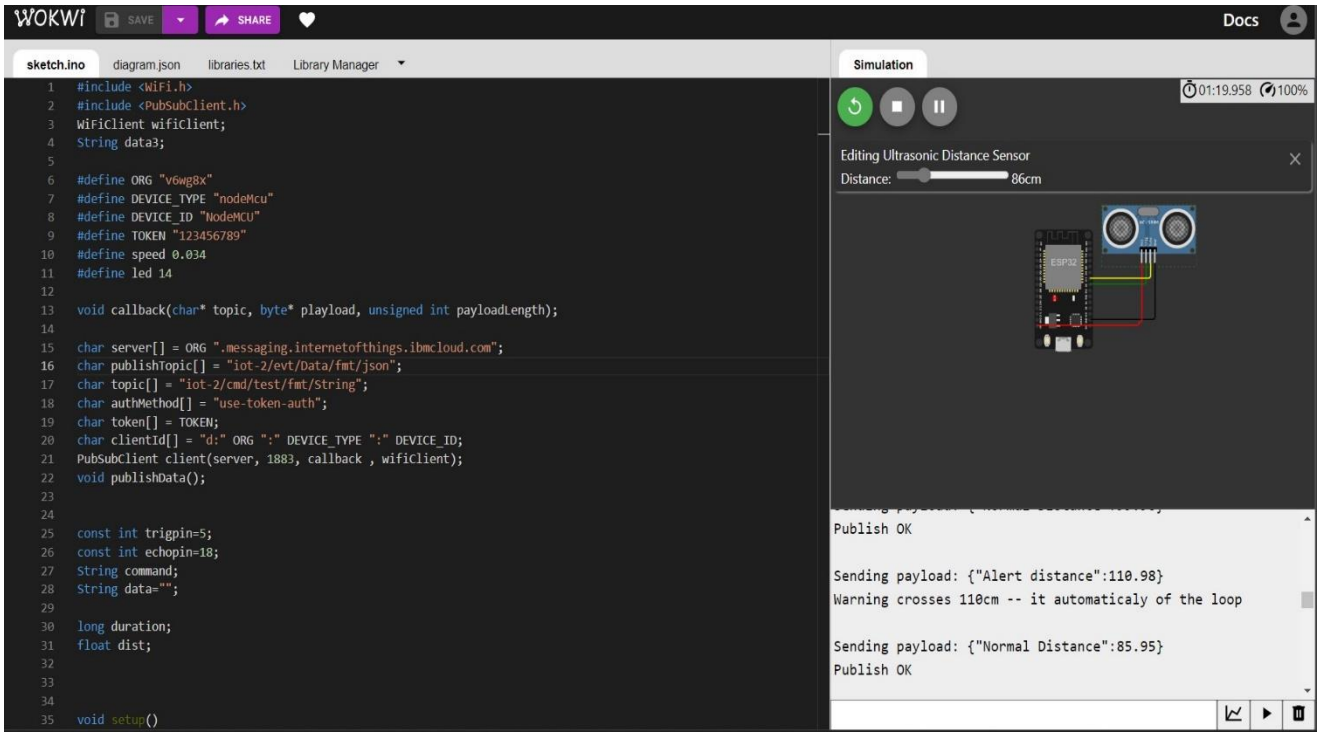
```
Sending payload: {"Normal Distance":99.98}
Publish OK

Sending payload: {"Normal Distance":99.98}
Publish OK

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

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



Connection Information

Basic connection information about this device

Device ID	NodeMCU
Device Type	NodeMCU
Device Added	Nov 2,2022.6:47pm
Added By	312119104009`@smartinternz.com
Connection Status	**Disconnected**
	Last connected 2,2022.6:47pm
	Client Address:145.40.94.93 Insecure
	Duration: a few seconds
	Data Tranferred:1.5 KB

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