Assignment Date: 23 oct 2022

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Maximum Marks: 2 marks

Team Id: PNT2022TMID29748

QUESTION:

Write code and connections in wokwi for ultrasonic sensor. Whenever the distance is less

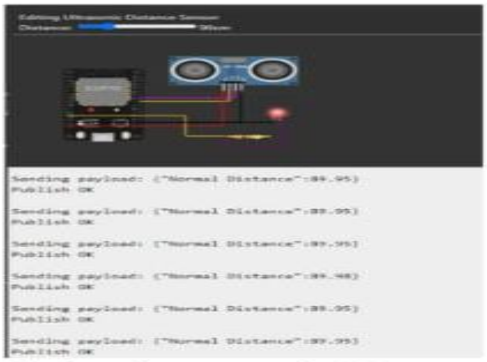
than 100 cms send “alert” to IBM cloud and display in the device recent events.

```
#include <WiFi.h>

#include <PubSubClient.h>

WiFiClient wifiClient;

String data3;

#define ORG "4yi0vc"

#define DEVICE_TYPE "nodeMcu"

#define DEVICE_ID "Assignment4"

#define TOKEN "123456789"

#define speed 0.034

#define led 14

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";

char publishTopic[] = "iot-2/evt/Data/fmt/json";

char topic[] = "iot-2/cmd/home/fmt/String";

char authMethod[] = "use-token-auth";

char token[] = TOKEN;

char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;

PubSubClient client(server, 1883, 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();
  }
}
```

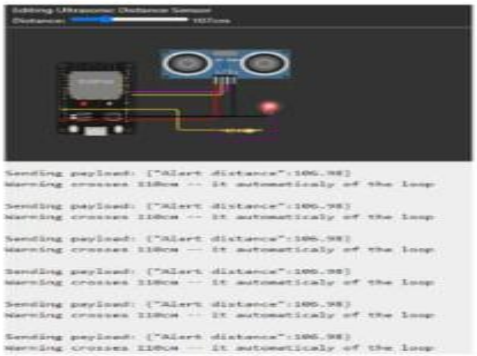
```
void wifiConnect() {
 Serial.print("Connecting to "); Serial.print("Wifi");
 WiFi.begin("Wokwi-GUEST", "", 6);
 while (WiFi.status() != WL_CONNECTED) {
  delay(500);
  Serial.print(".");
 }
 Serial.print("WiFi connected, IP address: "); Serial.println(WiFi.localIP());
}

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);
}
```

Output



```
Sending payload: {"Normal Distance":89.95}
Publish OK

Sending payload: {"Normal Distance":89.95}
Publish OK

Sending payload: {"Normal Distance":89.95}
Publish OK

Sending payload: {"Normal Distance":89.98}
Publish OK

Sending payload: {"Normal Distance":89.95}
Publish OK

Sending payload: {"Normal Distance":89.95}
Publish OK
```

1) when distance under 100 cm
it wil show normal distance



```
Sending payload: {"Alert distance":106.98}
Warning crosses 110cm -- it automaticaly of the loop

Sending payload: {"Alert distance":106.98}
Warning crosses 110cm -- it automaticaly of the loop

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Warning crosses 110cm -- it automaticaly of the loop
```
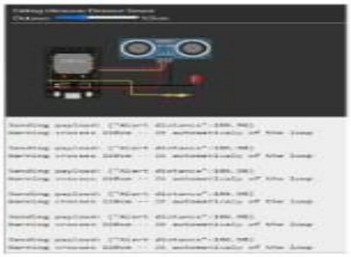

2) when distance cross 100 cm
it wil show ALERT with warning message
distance



```
Sending payload: {"Alert distance":[illegible]}
Warning crosses 110cm -- it automaticaly of the loop

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

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Warning crosses 110cm -- it automaticaly of the loop

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Warning crosses 110cm -- it automaticaly of the loop

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Sending payload: {"Alert distance":[illegible]}
Warning crosses 110cm -- it automaticaly of the loop
```
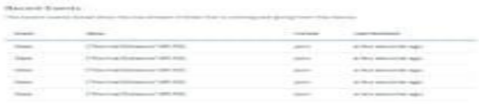
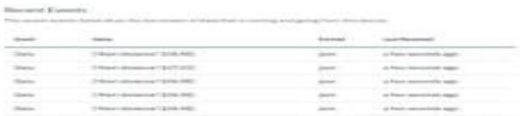

when it cross above 110 cm it totaly
move to iff state once it reduce to 110 it on again

IBM CLOUD OUPUT


Recent Events

[illegible]

Event	Value	Format	Last Received
Data	{"Normal Distance":[illegible]}	json	a few seconds ago
Data	{"Normal Distance":[illegible]}	json	a few seconds ago
Data	{"Normal Distance":[illegible]}	json	a few seconds ago
Data	{"Normal Distance":[illegible]}	json	a few seconds ago
Data	{"Normal Distance":[illegible]}	json	a few seconds ago


Recent Events

[illegible]

Event	Value	Format	Last Received
Data	{"Alert distance":[illegible]}	json	a few seconds ago
Data	{"Alert distance":[illegible]}	json	a few seconds ago
Data	{"Alert distance":[illegible]}	json	a few seconds ago
Data	{"Alert distance":[illegible]}	json	a few seconds ago
Data	{"Alert distance":[illegible]}	json	a few seconds ago