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);
```

```cpp
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();

  }

}
```

```cpp
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");
```

```cpp
  }
}
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

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

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

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

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