ASSIGNMENT-4

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

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CODING:

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "s8ov1q"
#define DEVICE_TYPE "gayathri"
#define DEVICE_ID "gayathri123"
#define TOKEN "123456789"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Gayathri/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 = "{\"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);
    }

  }
    if(dist>101 && dist<111){
    String payload = "{\"Normal Distance\":";
    payload += dist;
  payload += "}";

  Serial.print("\n");
  Serial.print("Sending payload: ");
  Serial.println(payload);

  }

 }

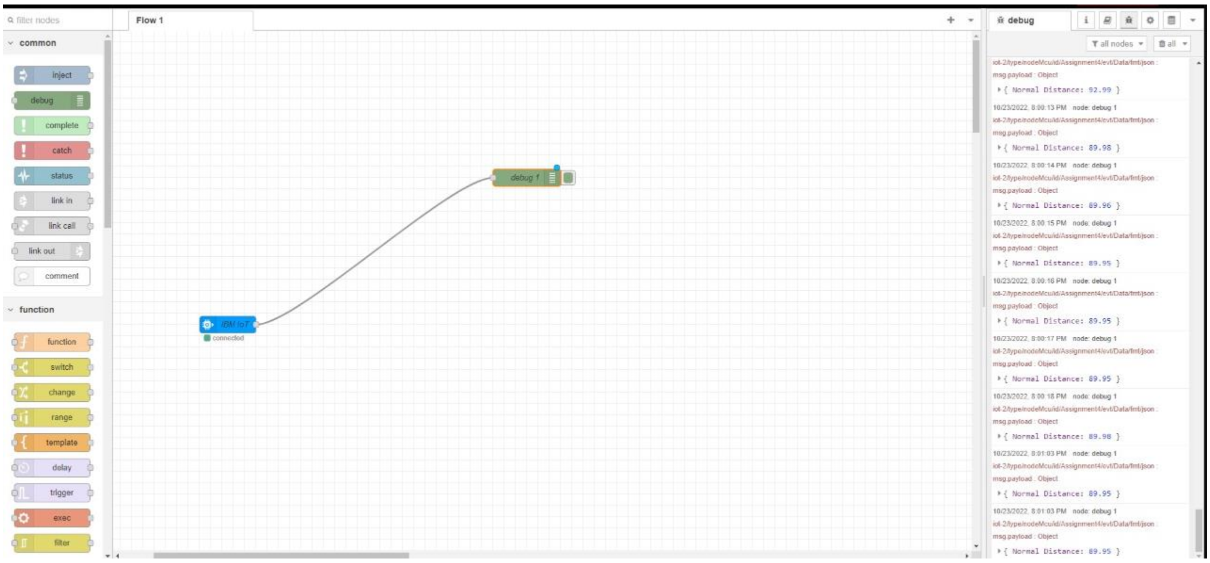


 void callback(char* subscribeTopic, byte* payload, unsigned int
payloadLength){
 Serial.print("callback invoked for topic:");
 Serial.println(subscribeTopic);
 for(int i=0; i<payloadLength; i++){
  dist += (char)payload[i];
 }
 Serial.println("data:"+ data3);
 if(data3=="lighton"){
  Serial.println(data3);
  digitalWrite(led,HIGH);
 }
 data3="";
}
```

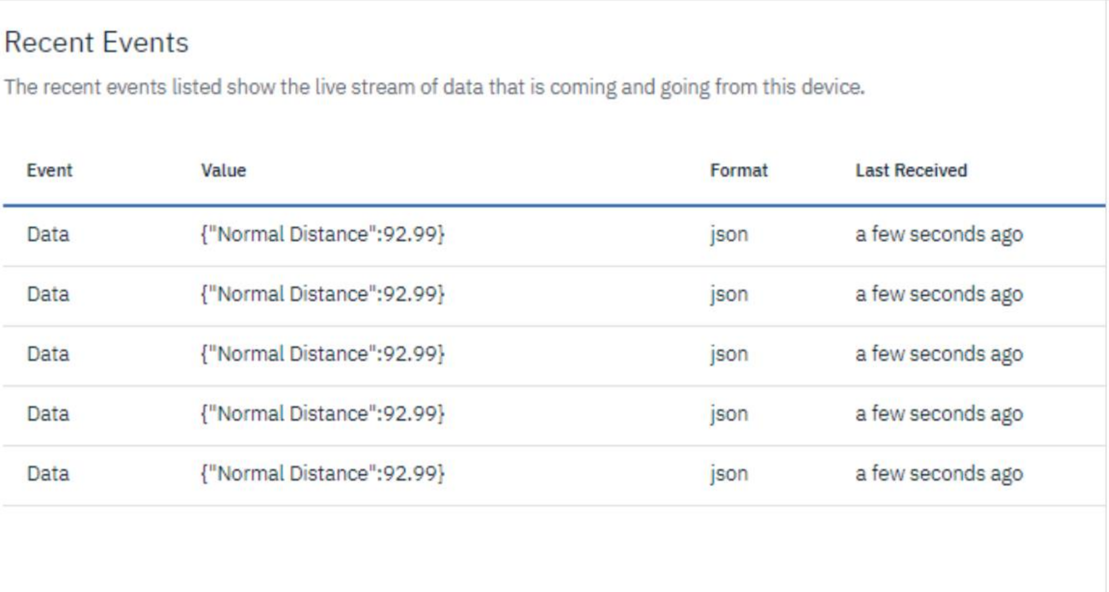
WOKWI LINK:

https://wokwi.com/projects/346308568806326867

NODE RED OUTPUT:



```
iot-2/type/nodeMcu/id/Assignment4/evt/Data/fmt/json :
msg.payload : Object
▸{ Normal Distance: 92.99 }
10/23/2022, 8:00:13 PM  node: debug 1
iot-2/type/nodeMcu/id/Assignment4/evt/Data/fmt/json :
msg.payload : Object
▸{ Normal Distance: 89.98 }
10/23/2022, 8:00:14 PM  node: debug 1
iot-2/type/nodeMcu/id/Assignment4/evt/Data/fmt/json :
msg.payload : Object
▸{ Normal Distance: 89.96 }
10/23/2022, 8:00:15 PM  node: debug 1
iot-2/type/nodeMcu/id/Assignment4/evt/Data/fmt/json :
msg.payload : Object
▸{ Normal Distance: 89.95 }
10/23/2022, 8:00:16 PM  node: debug 1
iot-2/type/nodeMcu/id/Assignment4/evt/Data/fmt/json :
msg.payload : Object
▸{ Normal Distance: 89.95 }
10/23/2022, 8:00:17 PM  node: debug 1
iot-2/type/nodeMcu/id/Assignment4/evt/Data/fmt/json :
msg.payload : Object
▸{ Normal Distance: 89.95 }
10/23/2022, 8:00:18 PM  node: debug 1
iot-2/type/nodeMcu/id/Assignment4/evt/Data/fmt/json :
msg.payload : Object
▸{ Normal Distance: 89.98 }
10/23/2022, 8:01:03 PM  node: debug 1
iot-2/type/nodeMcu/id/Assignment4/evt/Data/fmt/json :
msg.payload : Object
▸{ Normal Distance: 89.95 }
10/23/2022, 8:01:03 PM  node: debug 1
iot-2/type/nodeMcu/id/Assignment4/evt/Data/fmt/json :
msg.payload : Object
▸{ Normal Distance: 89.95 }
```

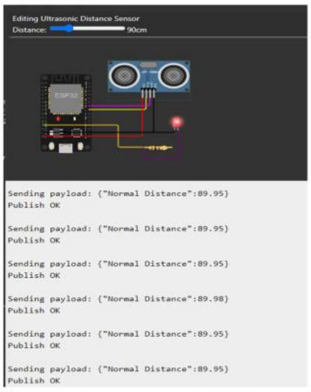


Recent Events

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":92.99}	json	a few seconds ago
Data	{"Normal Distance":92.99}	json	a few seconds ago
Data	{"Normal Distance":92.99}	json	a few seconds ago
Data	{"Normal Distance":92.99}	json	a few seconds ago
Data	{"Normal Distance":92.99}	json	a few seconds ago

Output



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

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

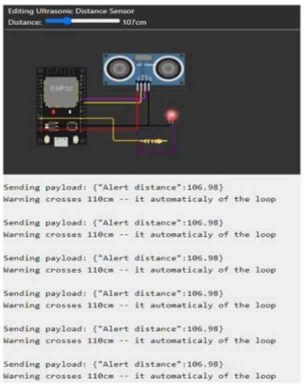
Sending payload: {"Normal Distance":89.95}
Publish OK

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

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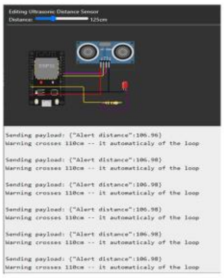
Warning crosses 110cm -- it automaticaly of the loop
```

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



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Sending payload: {"Alert distance":106.96}
Warning crosses 110cm -- it automaticaly of the loop

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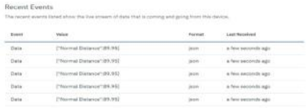
Sending payload: {"Alert distance":106.98}
Warning crosses 110cm -- it automaticaly of the loop
```

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

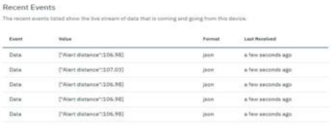
IBM CLOUD OUPUT



Recent Events

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":89.95}	json	a few seconds ago
Data	{"Normal Distance":89.95}	json	a few seconds ago
Data	{"Normal Distance":89.95}	json	a few seconds ago
Data	{"Normal Distance":89.95}	json	a few seconds ago
Data	{"Normal Distance":89.95}	json	a few seconds ago



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	{"Alert distance":106.98}	json	a few seconds ago
Data	{"Alert distance":107.03}	json	a few seconds ago
Data	{"Alert distance":106.98}	json	a few seconds ago
Data	{"Alert distance":106.98}	json	a few seconds ago
Data	{"Alert distance":106.98}	json	a few seconds ago