

Assignment - 4

Assignment Date	17 November 2022
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Maximum Marks	2 Marks

Question-1:

Write a code and make a connection in wokwi for ultrasonic sensor. Whenever distance is less than 100 send 'alert' to ibm cloud and display in device recent events.

Solution:

Code:

```
#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 automatically of the loop");
      digitalWrite(led,HIGH);
    }else {
      Serial.println("Publish FAILED");
    }

  }

}

}

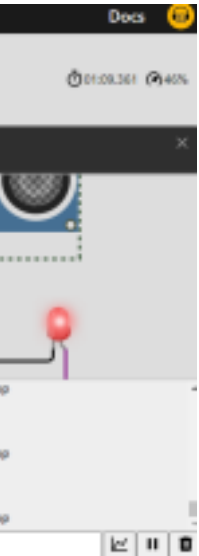
void callback(char* subscribeTopic, byte* payload, unsigned int payloadLength){
  Serial.print("callback invoked for topic:");
  Serial.println(subscribeTopic);
  for(int i=0; i<payloadLength; i++){
    dist += (char)payload[i];
  }
  Serial.println("data:"+ data3);
  if(data3=="lighton"){
    Serial.println(data3);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

```

WOKWI CODE:

OUTPUT

Distance is greater than 100



IBM cloud is connected and LED is off state

Distance is less than 100

LED is on state

IBM Cloud foundry connection

The screenshot shows the IBM Watson IoT Platform interface. At the top, there's a header with the platform name and a user profile. Below the header, there's a navigation bar with tabs: 'Browse', 'Action', 'Device Types', and 'Interfaces'. A sidebar on the left contains various icons for navigation. The main content area displays a table of data. The table has four columns: 'Event', 'Value', 'Format', and 'Last Received'. There are five rows of data, all from a device named 'Kannan'. The 'Value' column contains JSON strings: [{"Alert Distance": 57.96}], [{"Alert Distance": 47.96}], [{"Alert Distance": 57.96}], [{"Alert Distance": 47.96}], [{"Alert Distance": 57.96}]. The 'Format' column shows 'json' for all entries. The 'Last Received' column shows 'a few seconds ago' for all entries. At the bottom of the table, there's a pagination bar showing 'Items per page: 50' and '1-2 of 2 items'. On the right side of the pagination bar, it says '1 of 1 page' with navigation arrows.

Event	Value	Format	Last Received
Kannan	[{"Alert Distance": 57.96}]	json	a few seconds ago
Kannan	[{"Alert Distance": 47.96}]	json	a few seconds ago
Kannan	[{"Alert Distance": 57.96}]	json	a few seconds ago
Kannan	[{"Alert Distance": 47.96}]	json	a few seconds ago
Kannan	[{"Alert Distance": 57.96}]	json	a few seconds ago

Items per page: 50 | 1-2 of 2 items 1 of 1 page

Getting alert message from wokwi