

Assignment -4

Assignment Date	25 October 2022
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Question-1:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 cm send “alert” to ibm cloud and display in device recent events.

Code :

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "hycgw4"
#define DEVICE_TYPE "Distance"
#define DEVICE_ID "Ultrasonic"
#define TOKEN "WD6Mb(-d2F+X0xWqnB"
#define speed 0.034 #define led 14 char server[] = ORG
".messaging.internetofthings.ibmcloud.com"; char publishTopic[] = "iot-
2/evt/event2/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);
```

```
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!! 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("Publish OK");
    }
    }
    if(dist>100){
    String payload = "{\"Distance\": "; payload +=
dist; payload += "}";

```

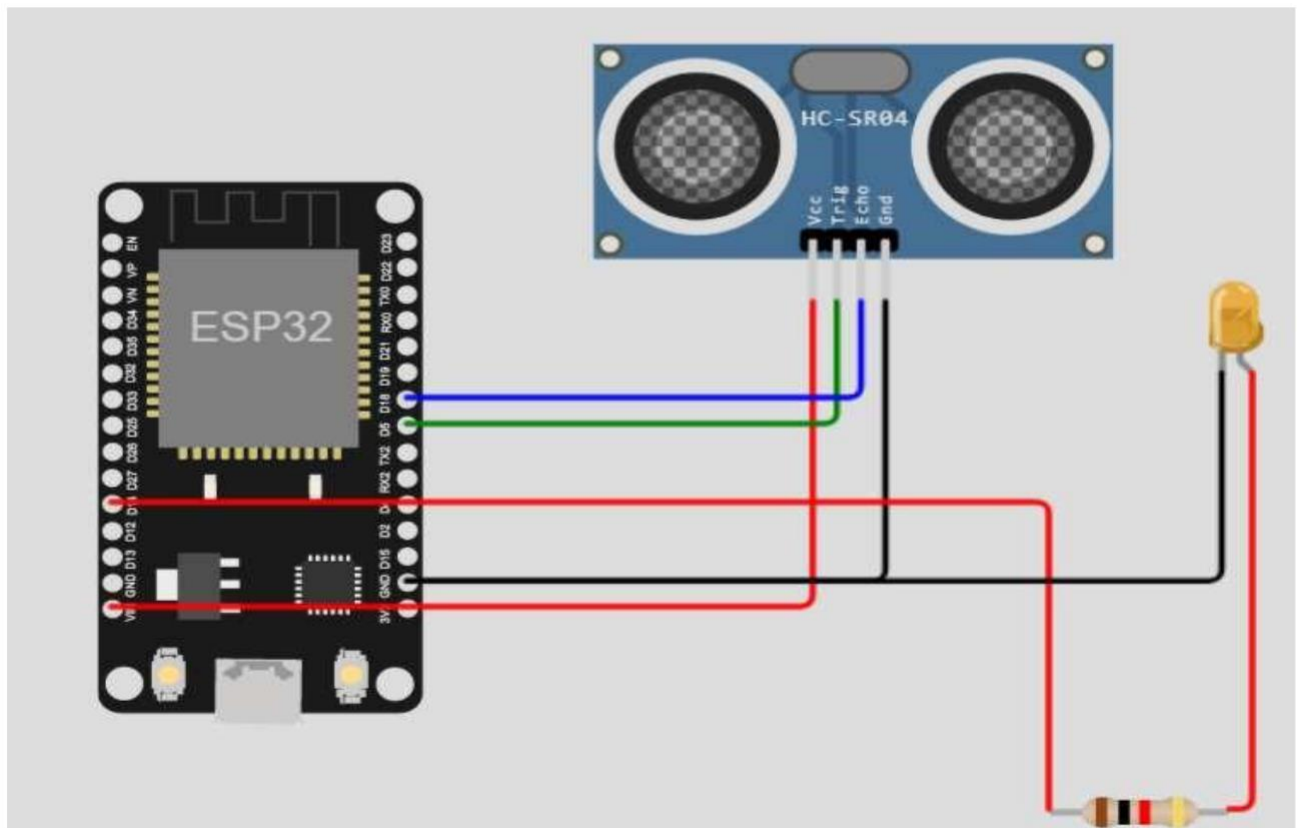
```

Serial.print("\n");
Serial.print("Sending payload: "); Serial.println(payload);
if(client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish OK");
}
else {
    Serial.println("Publish FAILED");
}
}

}

```

Connections:



WOKWI AND IBM CLOUD CONNECTED:

Ultrasonic Connected Distance Device Oct 25, 2022 7:04 PM

Identity Device Information Recent Events State Logs

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
event2	{"Alert!! Alert!! Distance":94.98}	json	a few seconds ago
event2	{"Alert!! Alert!! Distance":94.98}	json	a few seconds ago
event2	{"Alert!! Alert!! Distance":94.98}	json	a few seconds ago
event2	{"Alert!! Alert!! Distance":94.98}	json	a few seconds ago
event2	{"Alert!! Alert!! Distance":94.98}	json	a few seconds ago

Items per page 50 | 1-2 of 2 items

1 Simulation running

Wokwi data publishing to ibm cloud

- Distance = 162 cm
Status = Normal

WOKWI SAVE SHARE

sketch.ino diagram.json libraries.txt Library Manager

```

1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 WiFiClient wifiClient;
4 String data;
5 #define ORG "hycgw4"
6 #define DEVICE_TYPE "Distance"
7 #define DEVICE_ID "Ultrasonic"
8 #define TOKEN "wD6Mb(-d2F+X0x4qns"
9 #define speed 0.034
10 #define led 14
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/evt/event2/fmt/json";
13 char topic[] = "iot-2/cmd/home/fmt/string";
14 char authMethod[] = "use-token-auth";
15 char token[] = TOKEN;
16 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
17 PubSubClient client(server, 1883, wifiClient);
18
19
20
21 const int trigpin=5;
22 const int echopin=18;
23 String command;
24 String data="";
25
26 long duration;
27 float dist;
28
29
30
31 void setup()
32 {
33   Serial.begin(115200);

```

Simulation

00:54.434 96%

Editing Ultrasonic Distance Sensor

Distance: 162cm

Publish OK

Sending payload: {"Distance":162.25}

Publish OK

Sending payload: {"Distance":161.94}

Publish OK

Distance

Oct 25, 2022 7:04 PM

Identity Device Information Recent Events State Logs

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
event2	{"Distance":161.94}	json	a few seconds ago
event2	{"Distance":161.94}	json	a few seconds ago
event2	{"Distance":161.94}	json	a few seconds ago
event2	{"Distance":161.94}	json	a few seconds ago
event2	{"Distance":161.94}	json	a few seconds ago

Items per page 50 | 1-2 of 2 items

1 Simulation running

- Distance = 27 cm
Status = Alert Message

WOKWI

SAVE SHARE

Docs

sketch.ino diagram.json libraries.txt Library Manager

```

1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 WiFiClient wifiClient;
4 String data3;
5 #define ORG "hyc@4"
6 #define DEVICE_TYPE "Distance"
7 #define DEVICE_ID "Ultrasonic"
8 #define TOKEN "wD6Mb(-d2f+X0x4qnb"
9 #define speed 0.034
10 #define led 14
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/evt/event2/fmt/json";
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15 char token[] = TOKEN;
16 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
17 PubSubClient client(server, 1883, wifiClient);
18
19
20
21 const int trigpin=5;
22 const int echopin=18;
23 String command;
24 String data="";
25
26 long duration;
27 float dist;
28
29
30
31 void setup()
32 {
33   Serial.begin(115200);
34 }

```

Simulation

01:03.901 99%

Editing Ultrasonic Distance Sensor

Distance: 27cm

Publish OK

Sending payload: {"Alert!! Alert!! Distance":26.98}

Publish OK

Sending payload: {"Alert!! Alert!! Distance":26.98}

Publish OK

