

Assignment -4

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| Student Roll Number | 961819106026 |

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[] = "iot2/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("WokwiGUEST", "", 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
+= "}";

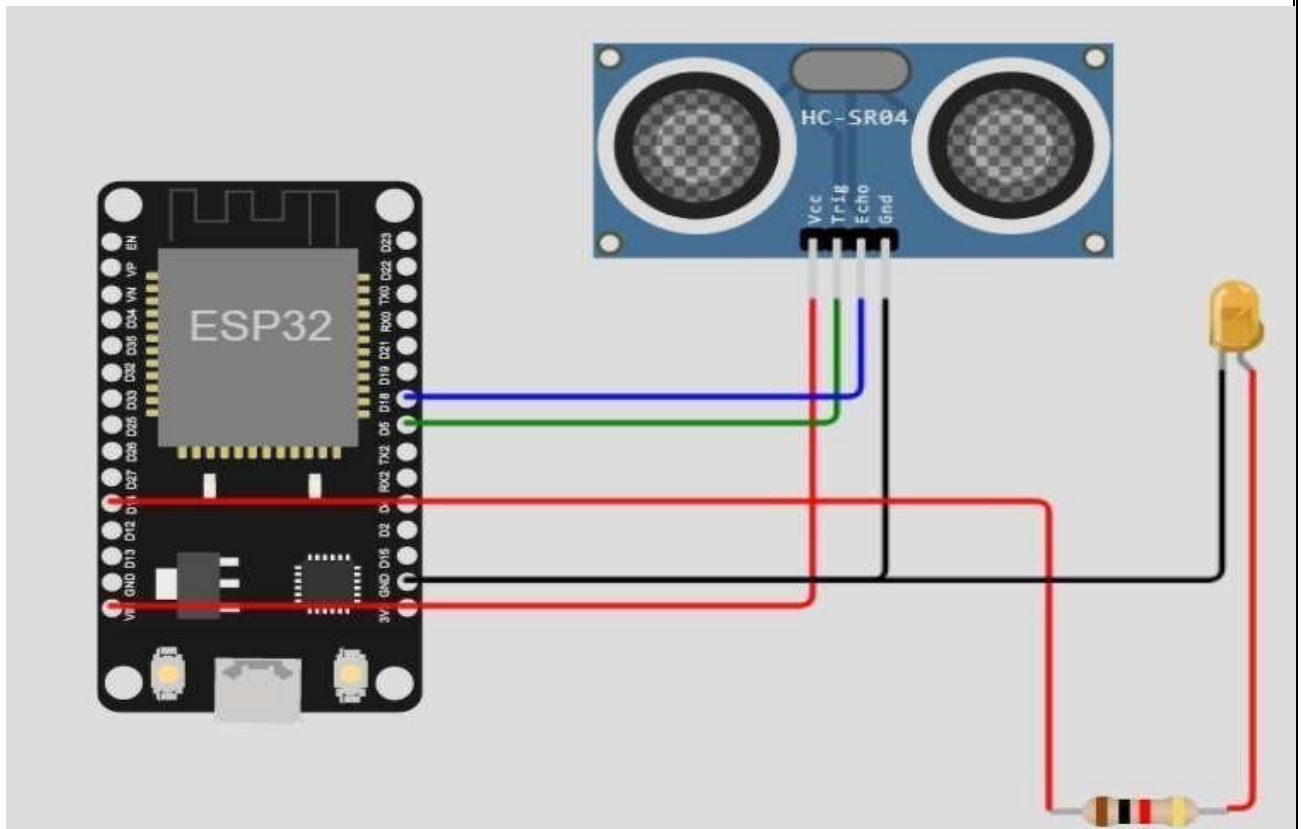
    Serial.print("\n");
    Serial.print("Sending payload: "); Serial.println(payload);
if (client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish OK");
    }
    }
    if(dist>100){
    String payload = "{\"Distance\":"; payload += dist;
payload += "}";

    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 |
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1 Simulation running

Wokwi data publishing to ibm cloud

2. Distance = 162 cm Status = Normal

```

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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);
  
```

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

