

Assignment 4

| | |
|--------------|--------------------------------------------------------|
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| Team ID | PNT2022TMID38327 |
| Project Name | IOT Based smart Crop production system for Agriculture |

Question:

Write a Code and Connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 cms send "alert" to ibm cloud and display in device recent events

```
#include <WiFi.h> //library for wifi
#include <PubSubClient.h> //library for MQTT
WiFiClient wifiClient;
String data3;
#define ORG "3i42s3"
#define DEVICE_TYPE "Venkatesh"
#define DEVICE_ID "Assignment_4"
#define TOKEN "12345678"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";

char publishTopic[] = "iot-2/evt/venkat/fmt/json";
char topic[] = "iot-2/cmd/status/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=19;
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");
}
}

```

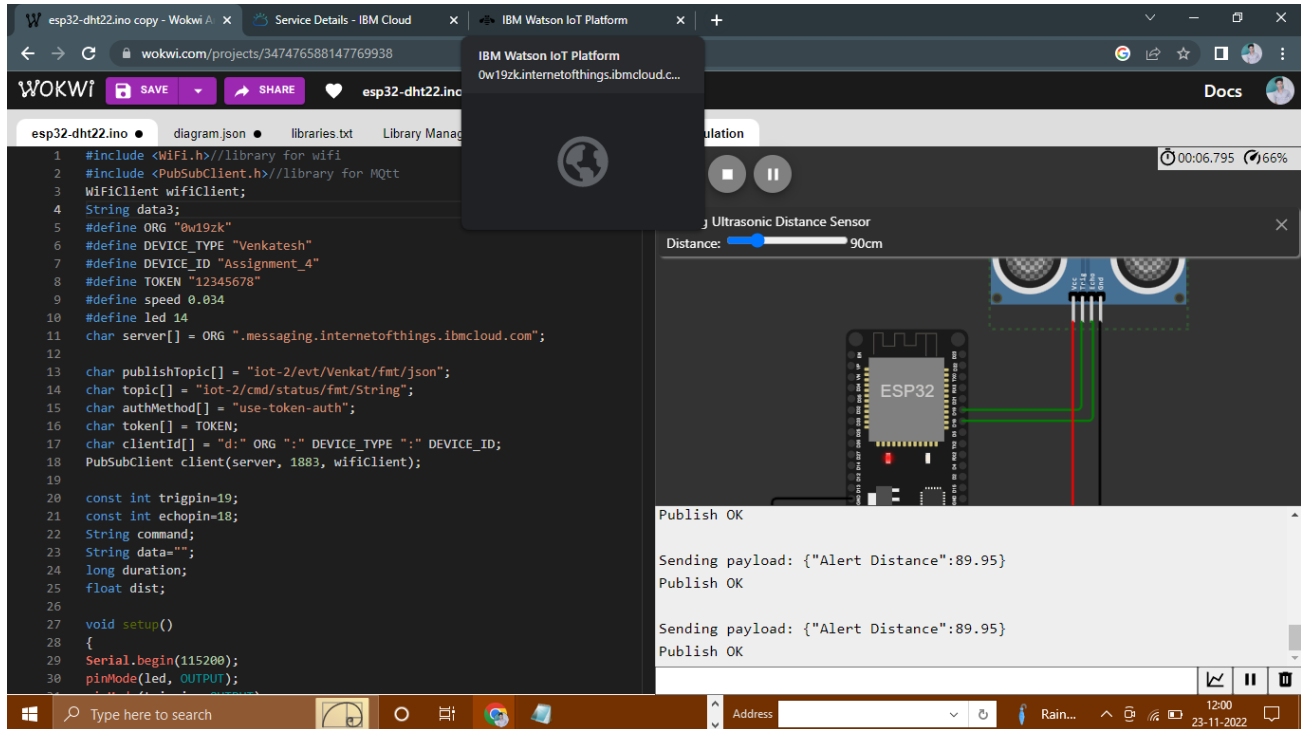
```

}
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("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");
    }
}
}
}

```

Output: 1. When distance less than 100 cm



IBM RECENT EVENTS:

The screenshot shows the IBM Watson IoT Platform dashboard. The 'Recent Events' tab is selected, displaying a table of events for the device 'Venkat'. The table has four columns: Event, Value, Format, and Last Received. The events show a series of 'Alert Distance' readings in JSON format, with values like 89.95 and 89.98, all received 'a few seconds ago'.

| Event | Value | Format | Last Received |
|--------|--------------------------|--------|-------------------|
| Venkat | {"Alert Distance":89.95} | json | a few seconds ago |
| Venkat | {"Alert Distance":89.95} | json | a few seconds ago |
| Venkat | {"Alert Distance":89.95} | json | a few seconds ago |
| Venkat | {"Alert Distance":89.95} | json | a few seconds ago |
| Venkat | {"Alert Distance":89.98} | json | a few seconds ago |

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2. When distance greater than 100 cm

The screenshot shows the Wokwi IDE interface. On the left, the 'esp32-dht22.ino' file is open, displaying the Arduino code. The code includes libraries for WiFi and MQTT, defines device credentials, and sets up an MQTT client. It also defines pins for a trigpin and echopin. The 'setup' function initializes the serial port and the MQTT client. The 'loop' function (partially visible) sends data to the MQTT broker.

```

1 #include <WiFi.h> //library for wifi
2 #include <PubSubClient.h> //library for MQTT
3 WiFiClient wificlient;
4 String data3;
5 #define ORG "0w19zk"
6 #define DEVICE_TYPE "Venkatesh"
7 #define DEVICE_ID "Assignment_4"
8 #define TOKEN "12345678"
9 #define speed 0.034
10 #define led 14
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12
13 char publishTopic[] = "iot-2/evt/Venkat/fmt/json";
14 char topic[] = "iot-2/cmd/status/fmt/String";
15 char authMethod[] = "use-token-auth";
16 char token[] = TOKEN;
17 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
18 PubSubClient client(server, 1883, wificlient);
19
20 const int trigpin=19;
21 const int echopin=18;
22 String command;
23 String data="";
24 long duration;
25 float dist;
26
27 void setup()
28 {
29   Serial.begin(115200);
30   pinMode(led, OUTPUT);
  
```

On the right, the 'Simulation' window shows a visual representation of the ESP32 board connected to an HC-SR04 ultrasonic sensor. The sensor is connected to the ESP32's pins. Below the simulation, the console output shows the following messages:

```

Publish OK
Sending payload: {"Distance":399.96}
Publish OK
Sending payload: {"Distance":399.94}
Publish OK
  
```

IBM RECENT EVENTS:

IBM Watson IoT Platform

buvasasri6886@gmail.com
ID: 0w19zk

[Add Device](#)

[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 |
|--------|---------------------|--------|-------------------|
| Venkat | {"Distance":399.96} | json | a few seconds ago |
| Venkat | {"Distance":399.92} | json | a few seconds ago |
| Venkat | {"Distance":399.94} | json | a few seconds ago |
| Venkat | {"Distance":399.96} | json | a few seconds ago |
| Venkat | {"Distance":399.96} | json | a few seconds ago |

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Address Rain... 12:00 23-11-2022