

Assignment 4

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Project Name	Smart Waste Management System For Metropolitan Cities

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 "91gpnd"
#define DEVICE_TYPE " Chandru "
#define DEVICE_ID "Assignment-4"
#define TOKEN "87654321"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";

char publishTopic[] = "iot-2/evt/ chandru /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");
}
}

```

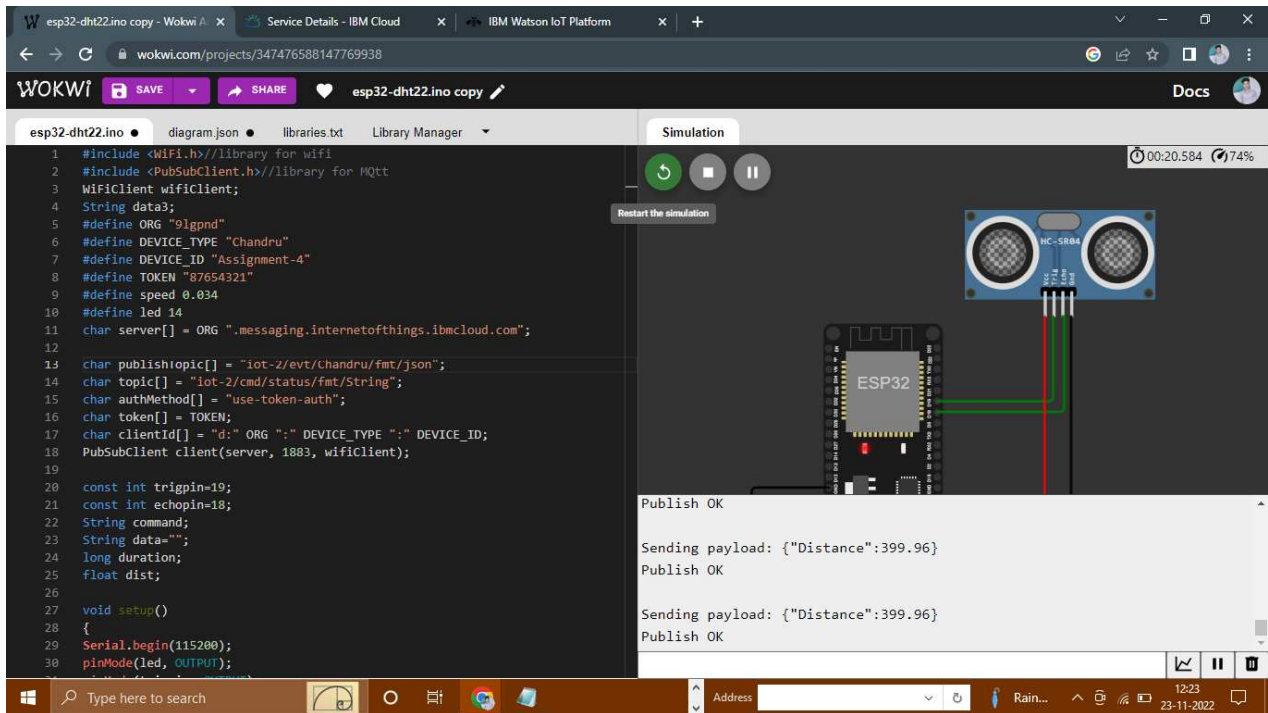
```

}
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 greater than 100 cm



IBM RECENT EVENTS:

The screenshot shows the IBM Watson IoT Platform dashboard. The top navigation bar includes 'Browse', 'Action', 'Device Types', and 'Interfaces'. A sidebar on the left contains icons for various functions. The main content area displays details for a device named 'Assignment-4' (ID: 54321), which is 'Connected' and of type 'NodeMCU'. Below this, the 'Recent Events' tab is selected, showing a table of events.

Event	Value	Format	Last Received
Chandru	{"Distance":399.96}	json	a few seconds ago
Chandru	{"Distance":399.96}	json	a few seconds ago
Chandru	{"Distance":399.94}	json	a few seconds ago
Chandru	{"Distance":399.96}	json	a few seconds ago
Chandru	{"Distance":399.96}	json	a few seconds ago

2. When distance less than 100 cm

The screenshot shows the Wokwi IDE interface. On the left, the 'esp32-dht22.ino' code is displayed. On the right, the 'Simulation' window shows a 3D model of an ESP32 board connected to an Ultrasonic Distance Sensor. The sensor's distance is currently set to 48cm. Below the simulation, a console window shows the output of the program.

```

1 #include <WiFi.h> //library for wifi
2 #include <PubSubClient.h> //library for MQTT
3 WiFiClient wifiClient;
4 String data3;
5 #define ORG "9lgpnd"
6 #define DEVICE_TYPE "Chandru"
7 #define DEVICE_ID "Assignment-4"
8 #define TOKEN "87654321"
9 #define speed 0.034
10 #define led 14
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12
13 char publishTopic[] = "iot-2/evt/Chandru/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);
  
```

Simulation console output:

```

Publish OK
Sending payload: {"Alert Distance":47.96}
Publish OK
Sending payload: {"Alert Distance":47.96}
Publish OK
  
```

IBM RECENT EVENTS:

The screenshot displays the IBM Watson IoT Platform interface. The top navigation bar includes tabs for 'Browse', 'Action', 'Device Types', and 'Interfaces'. A sidebar on the left contains icons for various platform features. The main content area shows a list of devices. The first device, '54321', is 'Disconnected'. The second device, 'Assignment-4', is 'Connected' and is selected. Below the device list, a modal window titled 'Recent Events' is open, showing a table of recent data points.

IBM Watson IoT Platform

chandru638421@gmail.com
ID: 9lgpnd

54321 Disconnected NodeMCU Device Oct 29, 2022 9:49 AM

Assignment-4 Connected Chandru Device Nov 23, 2022 12:17 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
Chandru	{"Alert Distance":47.96}	json	a few seconds ago
Chandru	{"Alert Distance":47.96}	json	a few seconds ago
Chandru	{"Alert Distance":47.96}	json	a few seconds ago
Chandru	{"Alert Distance":47.97}	json	a few seconds ago
Chandru	{"Alert Distance":47.97}	json	a few seconds ago

Type here to search

Address Rain... 12:24 23-11-2022