

Assignment-4

Date	24 October 2022
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Project Name	IoT Based Smart Crop Protection System for Agriculture

Question :

Write code and connections in wokwi for ultrasonic sensors. That whenever distance is less than 100 cms send "alert" to ibm cloud and display in device recent events.

Upload document with wokwi share link and images.

Wokwi:

<https://wokwi.com/projects/348224097656767060>

Code:

```
#include <WiFi.h>
#include <PubSubClient.h>

WiFiClient wifiClient;

#define ORG "wflvzq"
#define DEVICE_TYPE "ESP32_Controller"
#define DEVICE_ID "BME280_Sensor"
#define TOKEN "1eY2mi7YsxMlU&8V-i"
#define speed 0.034

char server[] = ORG".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/event_1/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(trigpin, OUTPUT);
  pinMode(echopin, INPUT);
  wifiConnect();
  mqttConnect();
}

void loop() {
  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("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);
    }
}

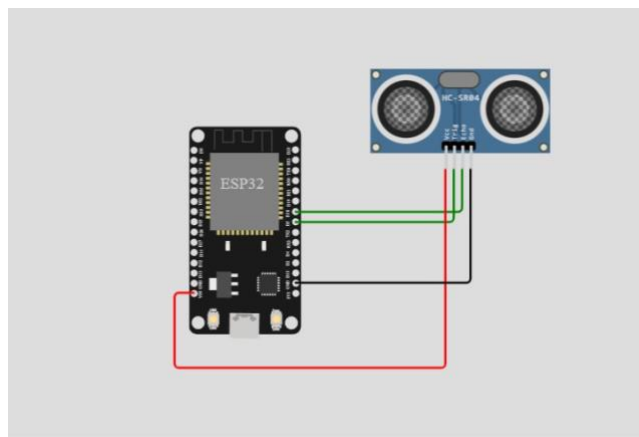
```

```

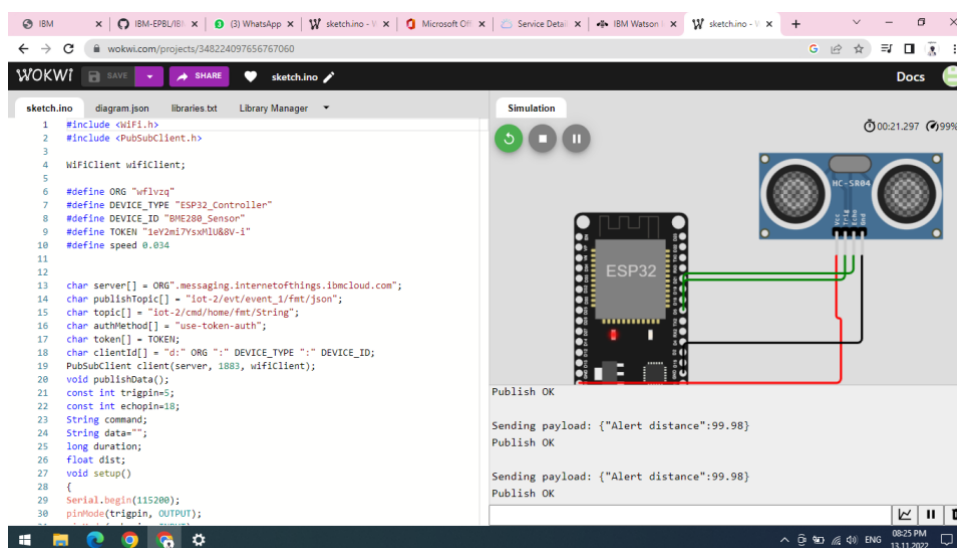
if (client.publish(publishTopic, (char*) payload.c_str()))
{
  Serial.println("Publish OK");
} else {
  Serial.println("Publish FAILED");
}
}
}
}

```

Diagram:



Wokwi Output:



IBM cloud output

The screenshot displays the IBM Watson IoT Platform interface. The top navigation bar includes 'Browse', 'Action', 'Device Types', and 'Interfaces'. A sidebar on the left contains various icons for navigation. The main content area shows a table of devices with columns: Device ID, Status, Device Type, Class ID, and Date Added. One device, 'BME280_Sensor', is selected and its details are shown in a modal window. The modal has tabs for 'Identity', 'Device Information', 'Recent Events', 'State', and 'Logs'. The 'Recent Events' tab is active, displaying a table of events with columns: Event, Value, Format, and Last Received. The events are simulated and show random numbers and alert distances. A status message at the bottom of the modal indicates '1 Simulation running'.

Device ID	Status	Device Type	Class ID	Date Added
BME280_Sensor	Connected	ESP32_Controller	Device	13 Nov 2022 20:20

Event	Value	Format	Last Received
event_1	{"randomNumber":96}	json	a few seconds ago
event_1	{"randomNumber":16}	json	a few seconds ago
event_1	{"Alert distance":99.98}	json	a few seconds ago
event_1	{"Alert distance":99.96}	json	a few seconds ago
event_1	{"randomNumber":97}		

1 Simulation running