Assignment 4

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Project Name	IOT Based smart Crop production system for Agriculture

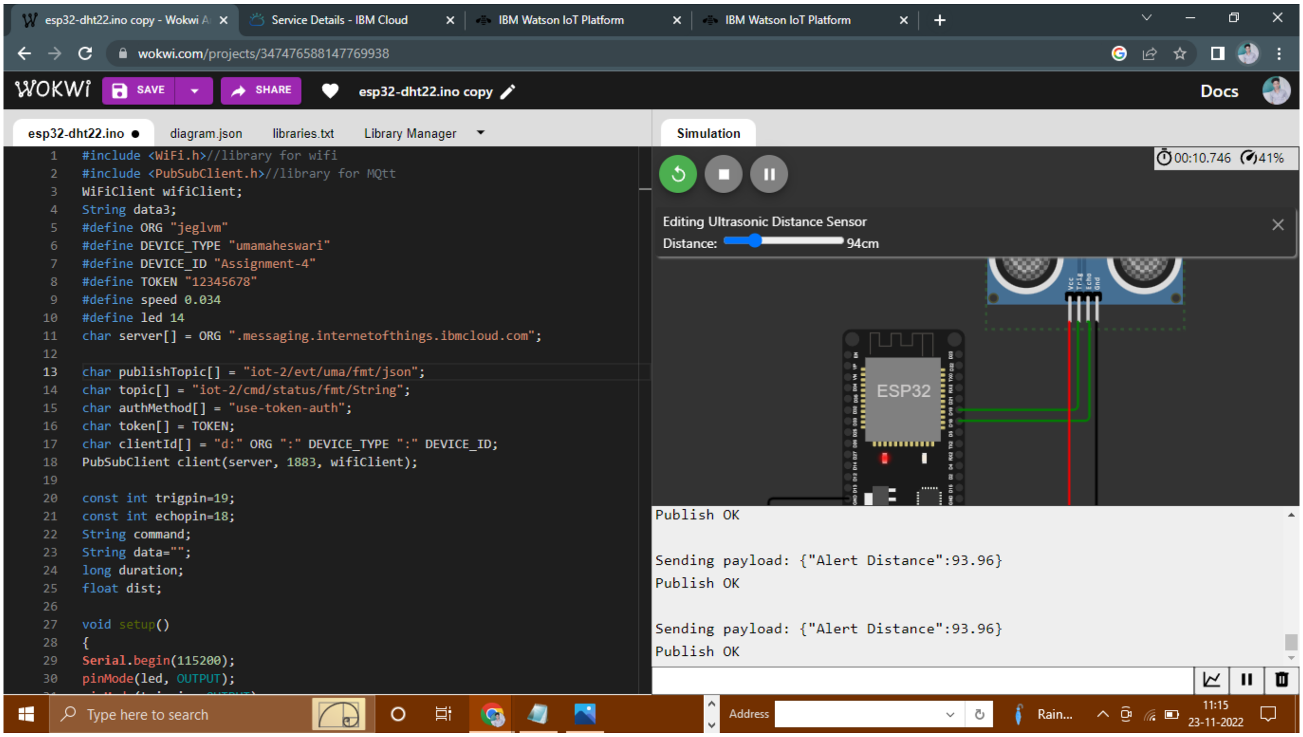
Question:

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 "jeglvm"
#define              DEVICE_TYPE
"umamaheswari"            #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/uma/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



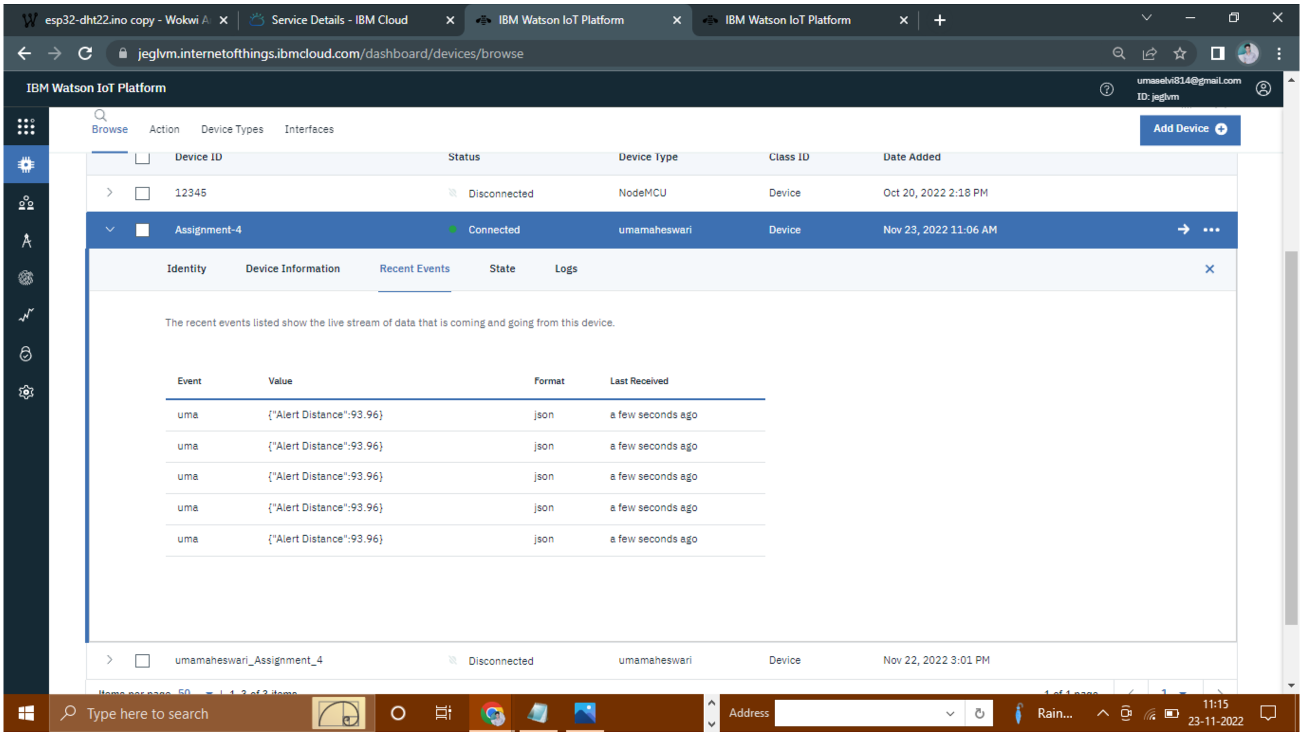
```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt
WiFiClient wifiClient;
String data3;
#define ORG "jeglvm"
#define DEVICE_TYPE "umamaheswari"
#define DEVICE_ID "Assignment-4"
#define TOKEN "12345678"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";

char publishTopic[] = "iot-2/evt/uma/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);
```

Editing Ultrasonic Distance Sensor

Distance: 94cm

```
Publish OK

Sending payload: {"Alert Distance":93.96}
Publish OK

Sending payload: {"Alert Distance":93.96}
Publish OK
```

IBM RECENT EVENTS:

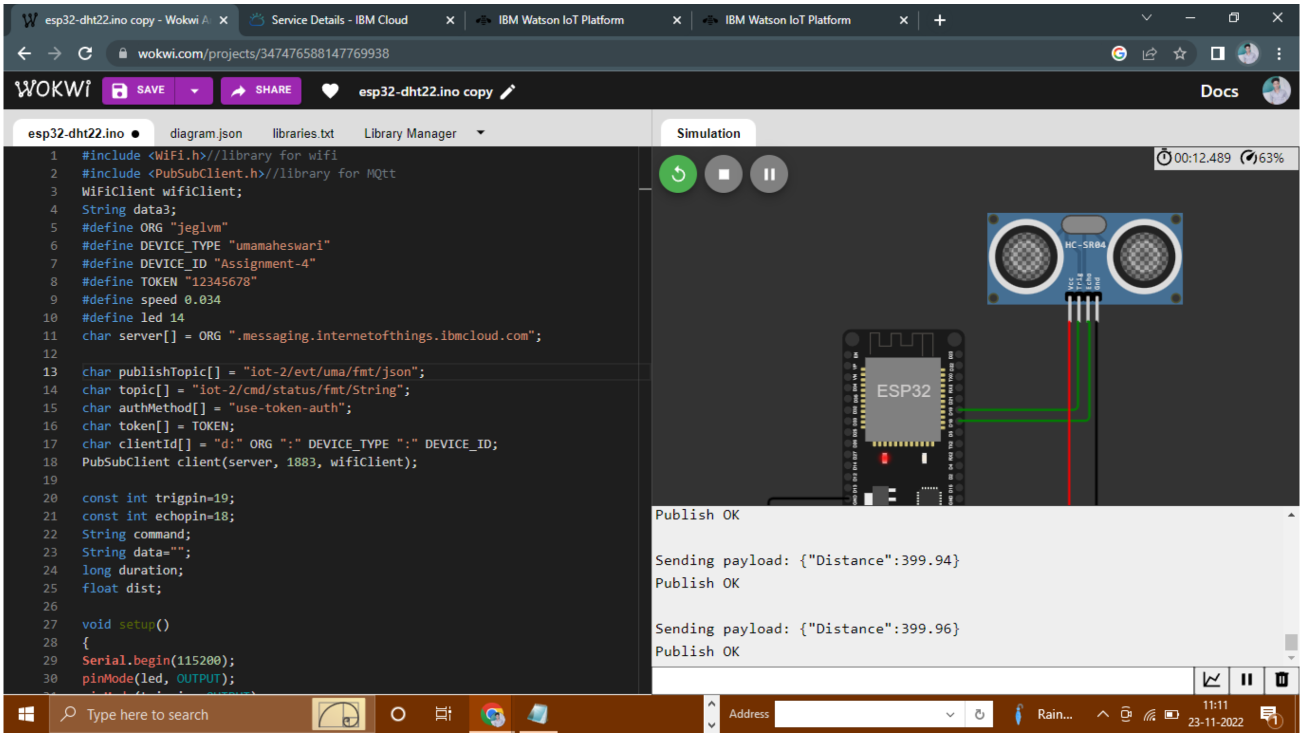


Device ID	Status	Device Type	Class ID	Date Added
12345	Disconnected	NodeMCU	Device	Oct 20, 2022 2:18 PM
Assignment-4	Connected	umamaheswari	Device	Nov 23, 2022 11:06 AM
umamaheswari_Assignment_4	Disconnected	umamaheswari	Device	Nov 22, 2022 3:01 PM

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

Event	Value	Format	Last Received
uma	{"Alert Distance":93.96}	json	a few seconds ago
uma	{"Alert Distance":93.96}	json	a few seconds ago
uma	{"Alert Distance":93.96}	json	a few seconds ago
uma	{"Alert Distance":93.96}	json	a few seconds ago
uma	{"Alert Distance":93.96}	json	a few seconds ago

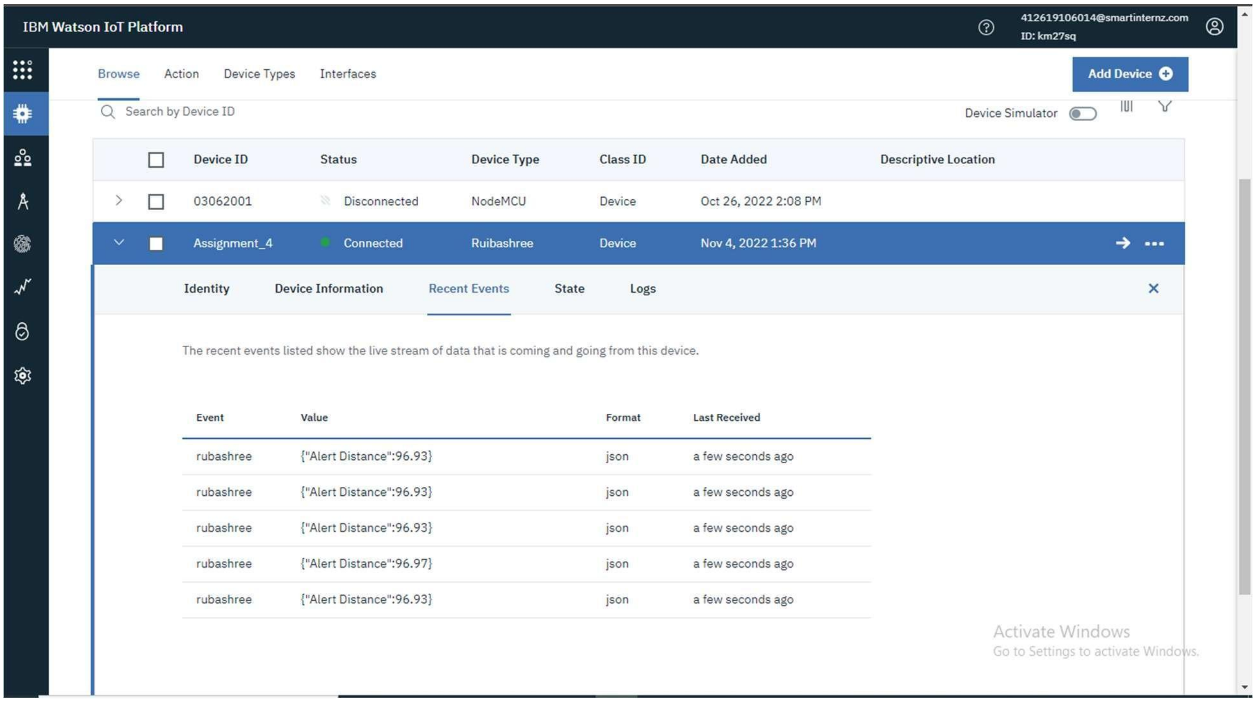
2. When distance greater than 100 cm



```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt
WiFiClient wifiClient;
String data3;
#define ORG "jeglvm"
#define DEVICE_TYPE "umamaheswari"
#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/uma/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);
```

```
Publish OK

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

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

IBM RECENT EVENTS:



	Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
□	03062001	Disconnected	NodeMCU	Device	Oct 26, 2022 2:08 PM	
□	Assignment_4	● Connected	Ruibashree	Device	Nov 4, 2022 1:36 PM	

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

Event	Value	Format	Last Received
rubashree	{"Alert Distance":96.93}	json	a few seconds ago
rubashree	{"Alert Distance":96.93}	json	a few seconds ago
rubashree	{"Alert Distance":96.93}	json	a few seconds ago
rubashree	{"Alert Distance":96.97}	json	a few seconds ago
rubashree	{"Alert Distance":96.93}	json	a few seconds ago