Smart Farmer - IoT Enabled Smart Farming Application

ASSIGNMENT -4

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To write 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.

Code:

```
#include <WiFi.h> // library for WIFI
#include <PubSubClient.h> // library for MQTT
//------- credentials of IBM Accounts ---------
#define ORG "04gt4e" // IBM organisation id
#define DEVICE_TYPE "esp32" // Device type mentioned in ibm watson iot
platform
#define DEVICE_ID "23456" // Device ID mentioned in ibm watson iot platform
#define TOKEN "zPS*0TV+fi0h)iq(sT" // Token
#define speed 0.034
#define led 14
String data3;
int LED = 4;
//-------------- customise above values ------------------------
char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; // server name
char publishTopic[] = "iot-2/evt/Data/fmt/json"; // topic name and type of
event perform and format in which data to be send
char topic[] = "iot-2/cmd/test/fmt/String"; // cmd Represent type and command
is test format of strings
char authMethod[] = "use-token-auth"; // authentication method char
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID; //Client id
//-------------------------------------------------------------------------
----------------------------------------
WiFiClient wifiClient; // creating instance for wificlient
PubSubClient client(server, 1883, wifiClient); // calling the predefined
client id by passing parameter like server id,port and wifi credential
const int trigpin=5; const
int echopin=18;
String command;
String data="";
long duration; float
dist;
```

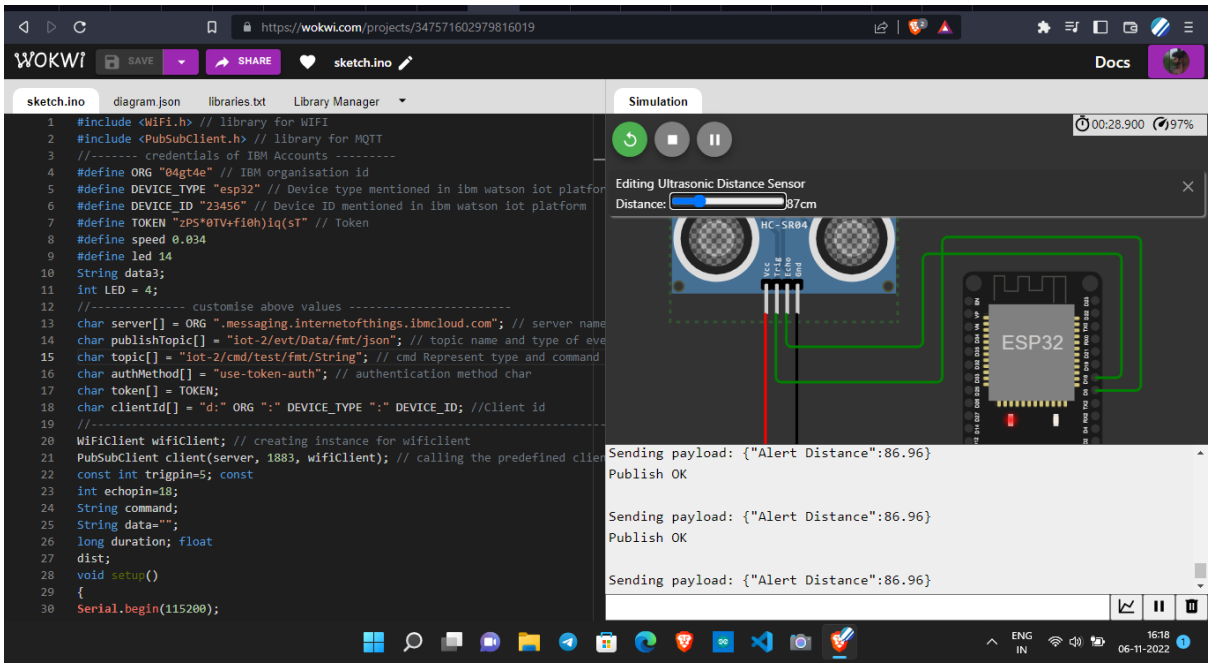
```
void setup()
{
Serial.begin(115200);
pinMode(led, OUTPUT);
pinMode(trigpin, OUTPUT);
pinMode(echopin, INPUT);
wifiConnect(); mqttConnect();
}
void loop() { bool isNearby
= dist < 100;
digitalWrite(led, isNearby);
publishData();
delay(500);
if (!client.loop())
{
mqttConnect(); // function call to connect to ibm
}
}
/* ------------------------------------------------retrieving to cloud------
----------------------------------------------*/
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();
}
}
```

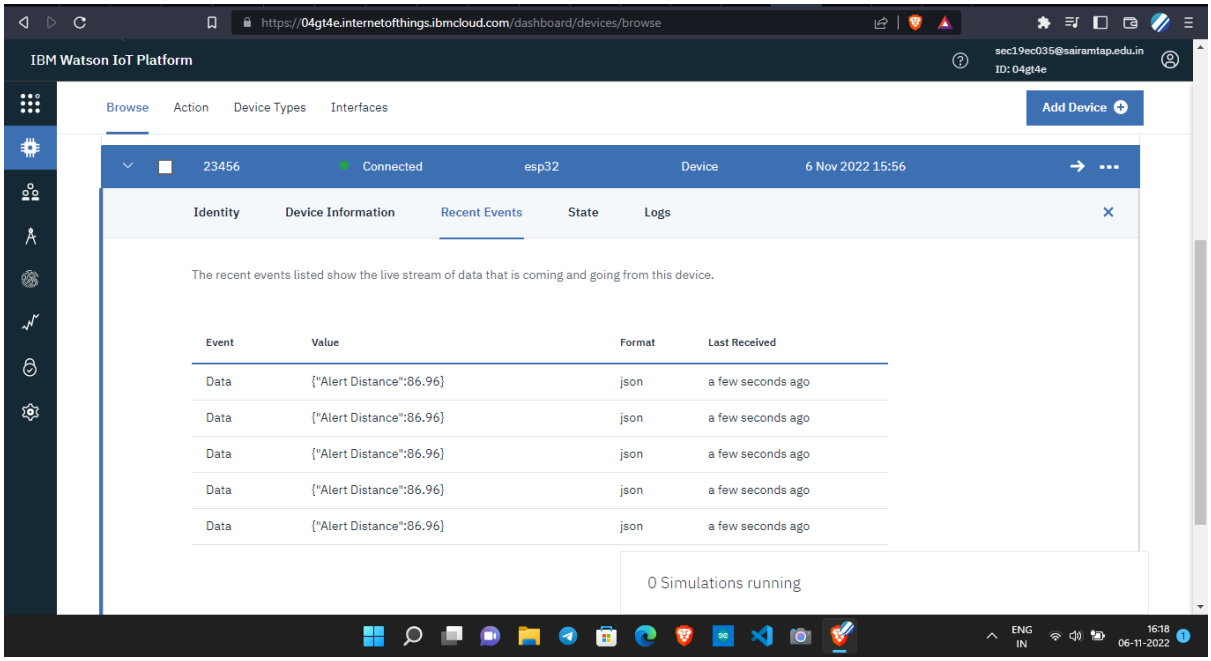
```
void initManagedDevice() {
if (client.subscribe(topic))
{
Serial.println("IBM subscribe to cmd OK");
}
else
{
Serial.println("subscribe to cmd FAILED");
}
}
void publishData()
{
digitalWrite(trigpin,LOW);
digitalWrite(trigpin,HIGH);
delayMicroseconds(10); digitalWrite(trigpin,LOW);
duration=pulseIn(echopin,HIGH);
dist=duration*speed/2;
if(dist<100)
{
digitalWrite(LED,HIGH); 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())) // if data is uploaded to cloud successfully,prints publish
ok else prints publish failed
{
Serial.println("Publish OK");
}
}
if(dist>100)
{
digitalWrite(LED,HIGH);
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
{
digitalWrite(LED,LOW);
```

```
Serial.println("Publish FAILED");
}
 }
}
```

Simulation Output:

https://wokwi.com/projects/347571602979816019




https://04gt4e.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
sec19ec035@sairamtap.edu.in
ID: 04gt4e
Browse
Action
Device Types
Interfaces
Add Device
23456
Connected
esp32
Device
6 Nov 2022 15:56
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
Data
{"Alert Distance":86.96}
json
a few seconds ago
Data
{"Alert Distance":86.96}
json
a few seconds ago
Data
{"Alert Distance":86.96}
json
a few seconds ago
Data
{"Alert Distance":86.96}
json
a few seconds ago
Data
{"Alert Distance":86.96}
json
a few seconds ago
0 Simulations running
ENG
IN
16:18
06-11-2022