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;
```

```cpp
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();
}
}
```

```cpp
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

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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