

VELAMMAL ENGINEERING COLLEGE

ELECTRONICS AND COMMUNICATION ENGINEERING

**SMART FARMERS - IOT
ENABLED FARMING
APPLICATION**

ASSIGNMENT – 4

BY:

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Question:

WRITE CODE AND CONNECTIONS IN WOKWI FOR ULTRASONIC. WHENEVER DISTANCE IS LESS THAN 100 CMS SEND “ALERT” TO IBM CLOUD AND DISPLAY IN DEVICE RECENT EVENTS.

CODE:

```
#include<WiFi.h>//libraryforwifi#include<PubSubClient.h>//libraryforMQTT

#defineECHO_GPI012
#defineTRIGGER_GPI013
#defineMAX_DISTANCE_CM100//Maximumof5meters#include"Ultrasonic.h"

Ultrasonicultrasonic(13,12);int
distance;

voidcallback(char*subscribetopic,byte*payload,unsignedintpayloadLength);

//-----credentialsofIBMAccounts-----

#defineORG"dv1snq"//IBMORGANIZATIONID
#defineDEVICE_TYPE"ESP32"//DevicetypementionedinibmwatsonIOTPlatform#define
DEVICE_ID "12345"//Device ID mentioned in ibm watson IOT
Platform#defineTOKEN"45682367915"//Token
Stringdata
3;float,h,t
;

//-----Customisetheabovevalues-----
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server
Namechar publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type
ofeventperform andformatinwhich datato besend
```

```

char authMethod[] = "use-token-auth";// authentication
methodchar token[] = TOKEN;
char clientId[] = "d:"ORG":DEVICE_TYPE ":"DEVICE_ID";//clientid

//-----
WiFiClient wifiClient; // creating the instance for wificlientPubSubClient client(server,
1883, callback ,wifiClient); //calling the predefined client id by passing parameter like
server id,port and wificredential

void setup()//configureing the ESP32
{
    Serial.begin(115200);delay(10);Serial.println();wifiConnect();mqttconnect();
}

void loop()//RecursiveFunction
{
    distance = ultrasonic.read(CM);if(distance < 100){Serial.print("Distance in CM: ");Serial.println(distance);PublishData(distance);delay(1000);if (!client.loop()) {mqttconnect();}}

    delay(1000);
}

/*.....retrieving to Cloud.....*/

void PublishData(float temp)
{mqttconnect();//function call for connecting to ibm
/*
    creating the String in inform JSont o update the data to ibmcloud
*/
String payload="{\"AlertDistance\":\":";

```

```

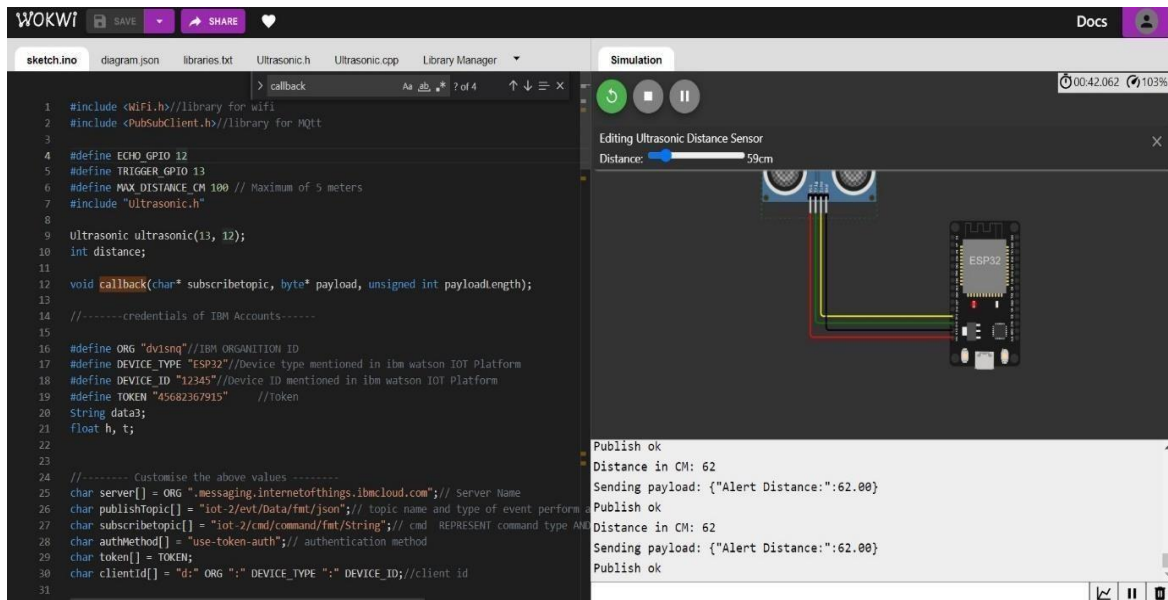
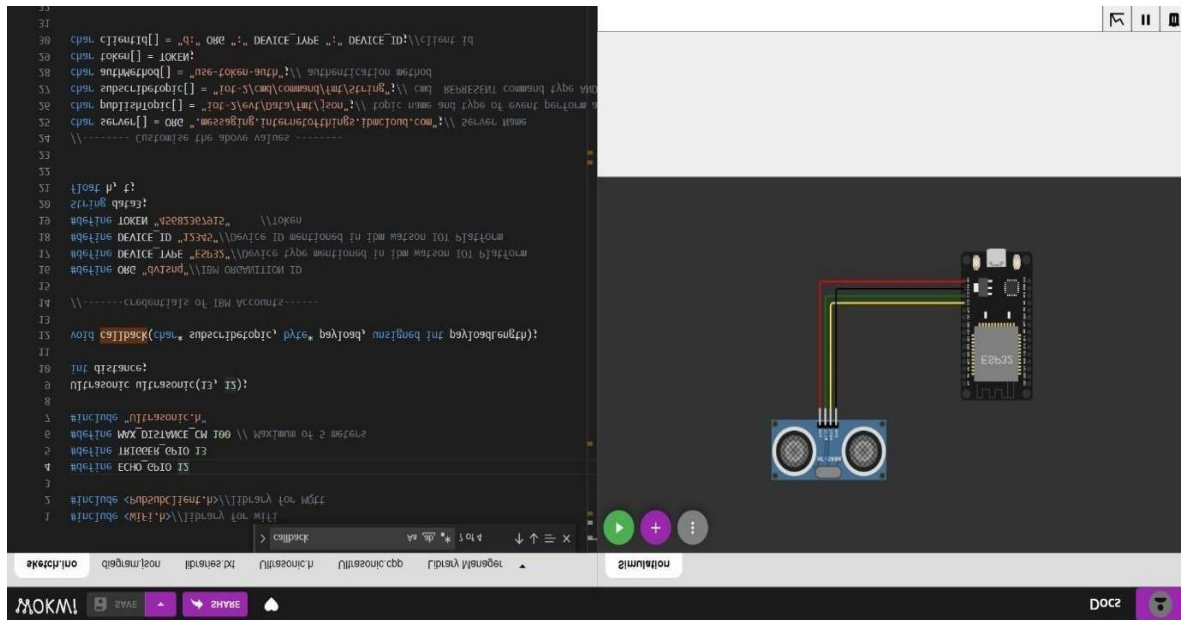
void initManagedDevice(){
    if (client.subscribe(subscribetopic))
        {Serial.println((subscribetopic));Serial.println("subscribetocmdOK"
        );
    }else{
        Serial.println("subscribetocmdFAILED");
    }
}

void callback(char*subscribetopic,byte*payload,unsignedintpayloadLength)
{

    Serial.print("callbackinvokedfortopic:");
    Serial.println(subscribetopic);
    for(inti=0;i<payloadLength;i++){
        //Serial.print((char)payload[i]);data3+=
        (char)payload[i];
    }
    Serial.println("data:"+data3);if(data3=="
    lighton")
    {
        Serial.println(data3);
    }
    else
    {
        Serial.println(data3);
    }
    data3="";
}

```

OUTPUT



IBM Watson IoT Platform

201904510@smartintenz.com
ID: dv1snq

Browse Action Device Types Interfaces

Add Device

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":62}	json	a few seconds ago
Data	{"Alert Distance":62}	json	a few seconds ago
Data	{"Alert Distance":62}	json	a few seconds ago
Data	{"Alert Distance":62}	json	a few seconds ago
Data	{"Alert Distance":62}	json	a few seconds ago

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WOKWI

SAVE SHARE

Docs

sketch.ino diagram.json libraries.txt Ultrasonic.h Ultrasonic.cpp Library Manager

```

1 #include <WiFi.h> //library for wifi
2 #include <PubSubClient.h> //library for MQTT
3
4 #define ECHO_GPIO 12
5 #define TRIGGER_GPIO 13
6 #define MAX_DISTANCE_CM 100 // Maximum of 5 meters
7 #include "Ultrasonic.h"
8
9 Ultrasonic ultrasonic(13, 12);
10 int distance;
11
12 void callback(char* subscribetopic, byte* payload, unsigned int payloadlength);
13
14 //-----credentials of IBM Accounts-----
15
16 #define ORG "dv1snq" //IBM ORGANIZATION ID
17 #define DEVICE_TYPE "ESP32" //Device type mentioned in ibm watson IOT Platform
18 #define DEVICE_ID "12345" //Device ID mentioned in ibm watson IOT Platform
19 #define TOKEN "45682367915" //Token
20 String data3;
21 float h, t;
22
23
24 //----- Customise the above values -----
25 char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; // Server Name
26 char publishTopic[] = "iot-2/evt/Data/fmt/json"; // topic name and type of event perform
27 char subscribetopic[] = "iot-2/cmd/command/fmt/String"; // cmd REPRESENT command type AND
28 char authMethod[] = "use-token-auth"; // authentication method
29 char token[] = TOKEN;
30 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID; //client id
31
32

```

Simulation

00:39:161 100%

Editing Ultrasonic Distance Sensor

Distance: 124cm

Publish ok

Distance in CM: 56

Sending payload: {"Alert Distance":56.00}

Publish ok

Distance in CM: 56

Sending payload: {"Alert Distance":56.00}

Publish ok