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:

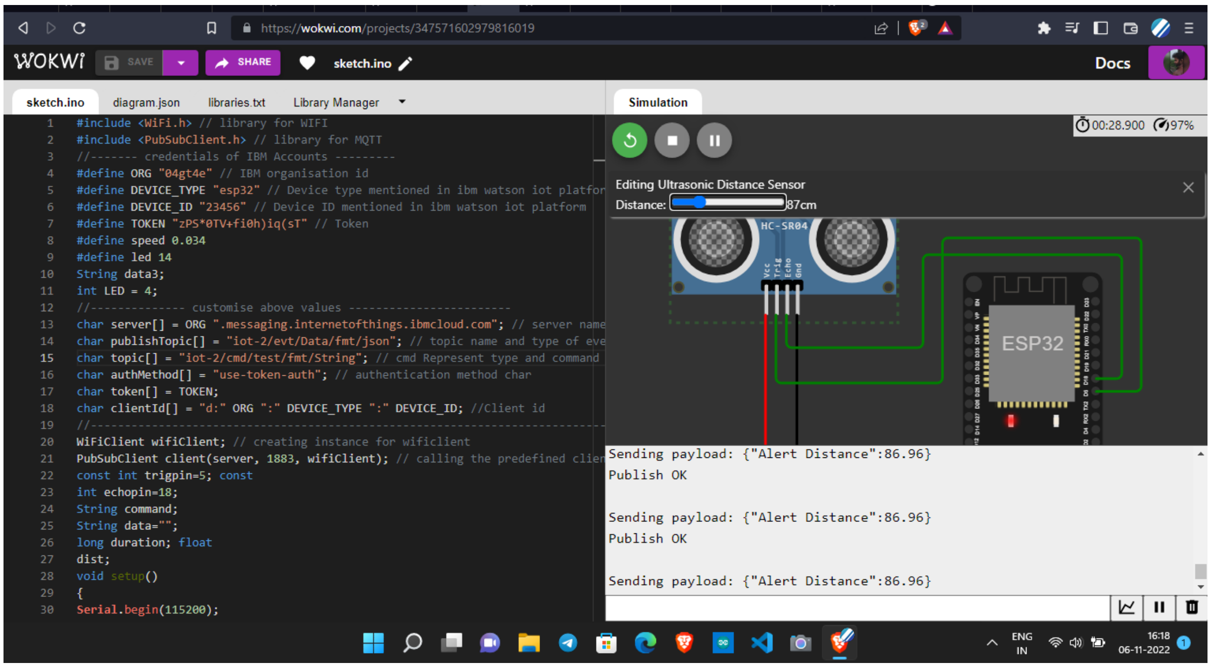
```
#include<WiFi.h>// library for WIFI
#include<PubSubClient.h>// library for MQTT
//------- credentials of IBM Accounts ---------
#define ORG "04gt4e"// IBM organisation id
#define DEVICE_TYPE "esp32"// Device type mentioned in ibmwatsoniot platform
#define DEVICE_ID "23456"// Device ID mentioned in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

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

```
if(client.subscribe(topic))
{
Serial.println("IBM subscribe to cmd OK");
}
else
{
Serial.println("subscribe to cmd FAILED");
}
}
voidpublishData()
{
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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char token[] = TOKEN;
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int echopin=18;
String command;
String data="";
long duration; float
dist;
void setup()
{
Serial.begin(115200);
```

```
Sending payload: {"Alert Distance":86.96}
Publish OK

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Publish OK

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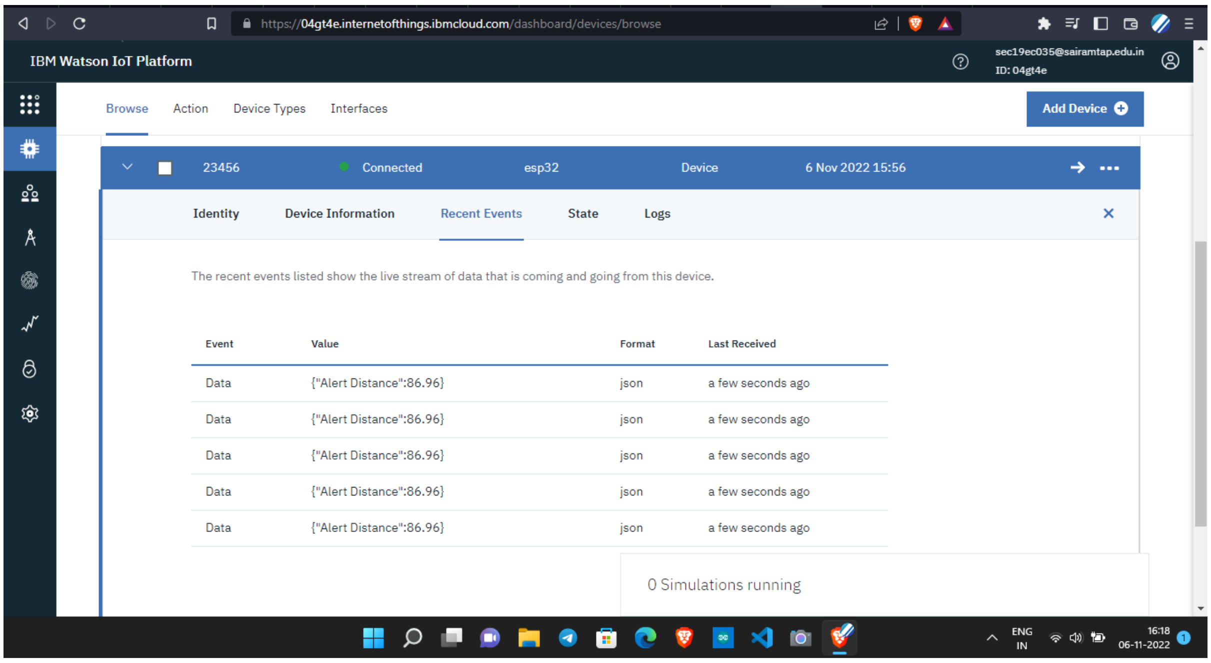
```



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