ASSIGNMENT 4

Team ID :- PNT2022TMID33671

Project name :- Smart Farmer - IoT Enabled Smart Farming Application.

QUESTION:

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. Upload document with wokwi share link and images of ibm cloud.

SOLUTION:

CODE:

```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt
// creating the instance by passing pin and typr of dht connected
float distance;
 #define sound_speed 0.034
 int trigpin=18;
 int echopin=19;
  int led=5;
   int LED=9;
  long duration;
  String message;// creating the instance by passing pin and typr of dht connected
```

```
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);

//-------credentials of IBM Accounts------

#define ORG "93oivx"//IBM ORGANITION ID

#define DEVICE_TYPE "NodeMCU"//Device type mentioned in ibm watson IOT Platform

#define DEVICE_ID "12345"//Device ID mentioned in ibm watson IOT Platform

#define TOKEN "12345678"     //Token

String data3;

float h, t;



//-------- Customise the 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 subscribetopic[] = "iot-2/cmd/command/fmt/String";// cmd  REPRESENT command type AND COMMAND IS TEST OF FORMAT STRING

char authMethod[] = "use-token-auth";// authentication method

char token[] = TOKEN;

char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id
```

```
//---------------------------------------
WiFiClient wifiClient; // creating the instance for wificlient
PubSubClient client(server, 1883, callback ,wifiClient); //calling the predefined client id by passing parameter like server id,portand wificredential
void setup()// configureing the ESP32
{
  Serial.begin(115200);
pinMode(trigpin,OUTPUT);
pinMode(echopin,INPUT);
pinMode(led,OUTPUT);
  delay(10);
  Serial.println();
  wificonnect();
  mqttconnect();
}

void loop()// Recursive Function
{

digitalWrite(trigpin,LOW);
digitalWrite(trigpin,HIGH);
delay(1000);
digitalWrite(trigpin,LOW);
duration=pulseIn(echopin,HIGH);
distance=duration*sound_speed/2;
```

```
Serial.println("distance"+String(distance)+"cm");
 if(distance<100)
 {
   message="Alert";
   digitalWrite(led,HIGH);
   } else
{
  message="No problem";
  digitalWrite(led,LOW);
  }
  delay(1000);
  PublishData(distance,message);
  if (!client.loop()) {
    mqttconnect();
  }
}




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

void PublishData(float d, String a) {
  mqttconnect();//function call for connecting to ibm
  /*
```

```
    creating the String in in form JSon to update the data to ibm cloud
  */
String payload = "{\"distance\":";
payload += d; payload += "}";
payload += "," "{\"message\":";
 payload += a;
  payload += "}";



  Serial.print("Sending payload: ");
  Serial.println(payload);



  if (client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish ok");// if it sucessfully upload data on the cloud then it
will print publish ok in Serial monitor or else it will print publish failed
  } else {
    Serial.println("Publish failed");
  }


}
void mqttconnect() {
  if (!client.connected())
  { Serial.print("Reconnecting client to ");
  Serial.println(server);
```

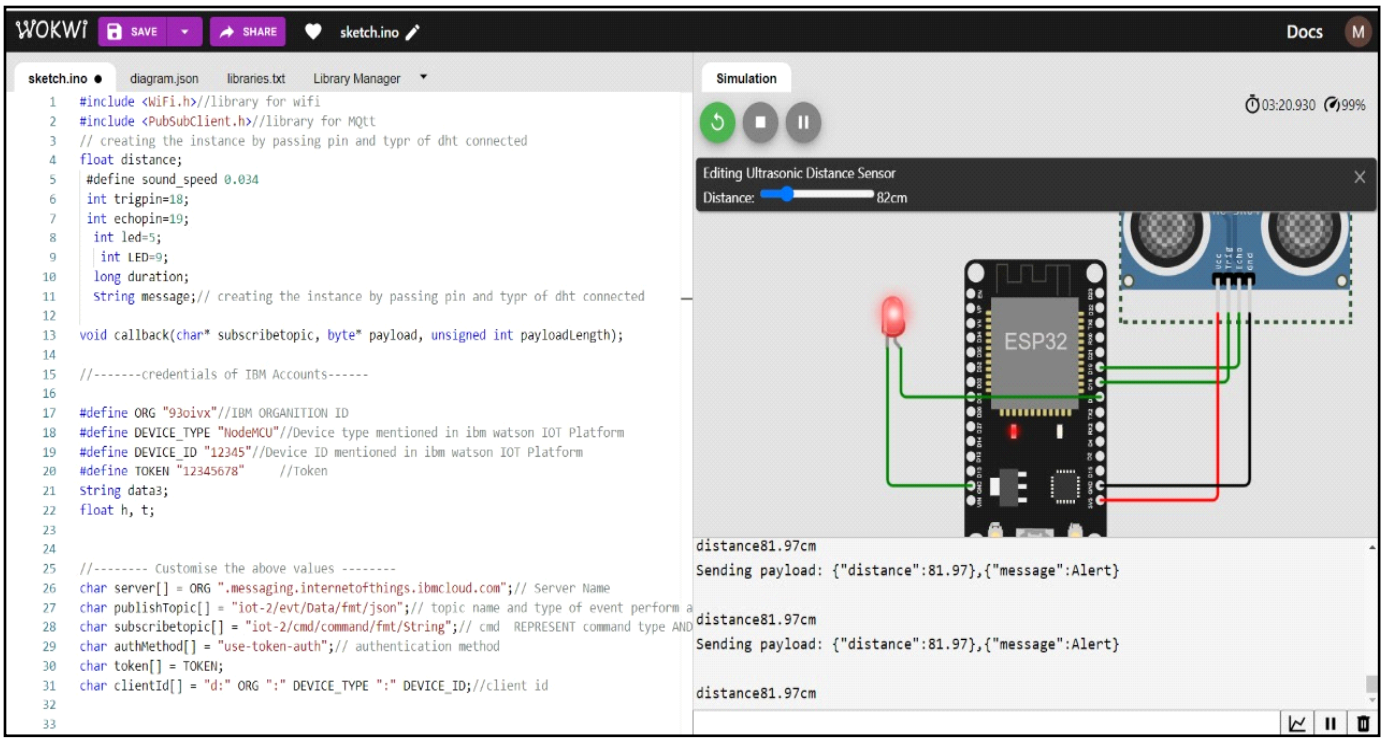
```
  while (!!!client.connect(clientId, authMethod, token)) {
    Serial.print(".");
    initManagedDevice();
    Serial.println();
  }
}
void wificonnect() //function defination for wificonnect
{
  Serial.println();
  Serial.print("Connecting to ");

  WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to establish the
connection
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }
  Serial.println("");
  Serial.println("WiFi connected");
  Serial.println("IP address: ");
  Serial.println(WiFi.localIP());
}

void initManagedDevice() {
  if (client.subscribe(subscribetopic)) {
```

```
   Serial.println((subscribetopic));
   Serial.println("subscribe to cmd OK");
  } else {
   Serial.println("subscribe to cmd FAILED");
  }
}
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
{
  Serial.print("callback invoked for topic: ");
  Serial.println(subscribetopic);
  for (int i = 0; i < payloadLength; i++) {
    //Serial.print((char)payload[i]);
    data3 += (char)payload[i];
  }
 data3="";
}
```

DISTANCE IS LESS THAN 100 cms:

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char subscribetopic[] = "iot-2/cmd/command/fmt/String";// cmd  REPRESENT command type AND
char authMethod[] = "use-token-auth";// authentication method
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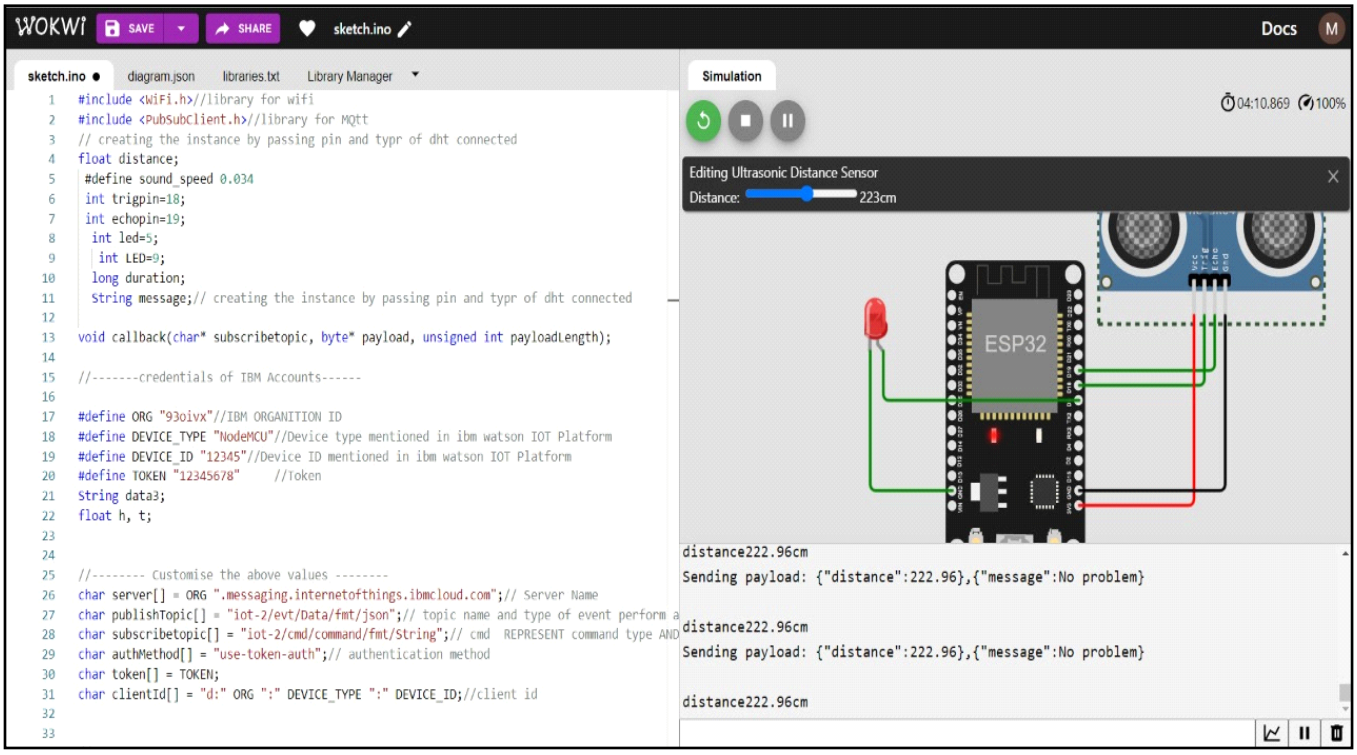
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id
```

DISTANCE IS GREATER THAN 100 cms:

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char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id
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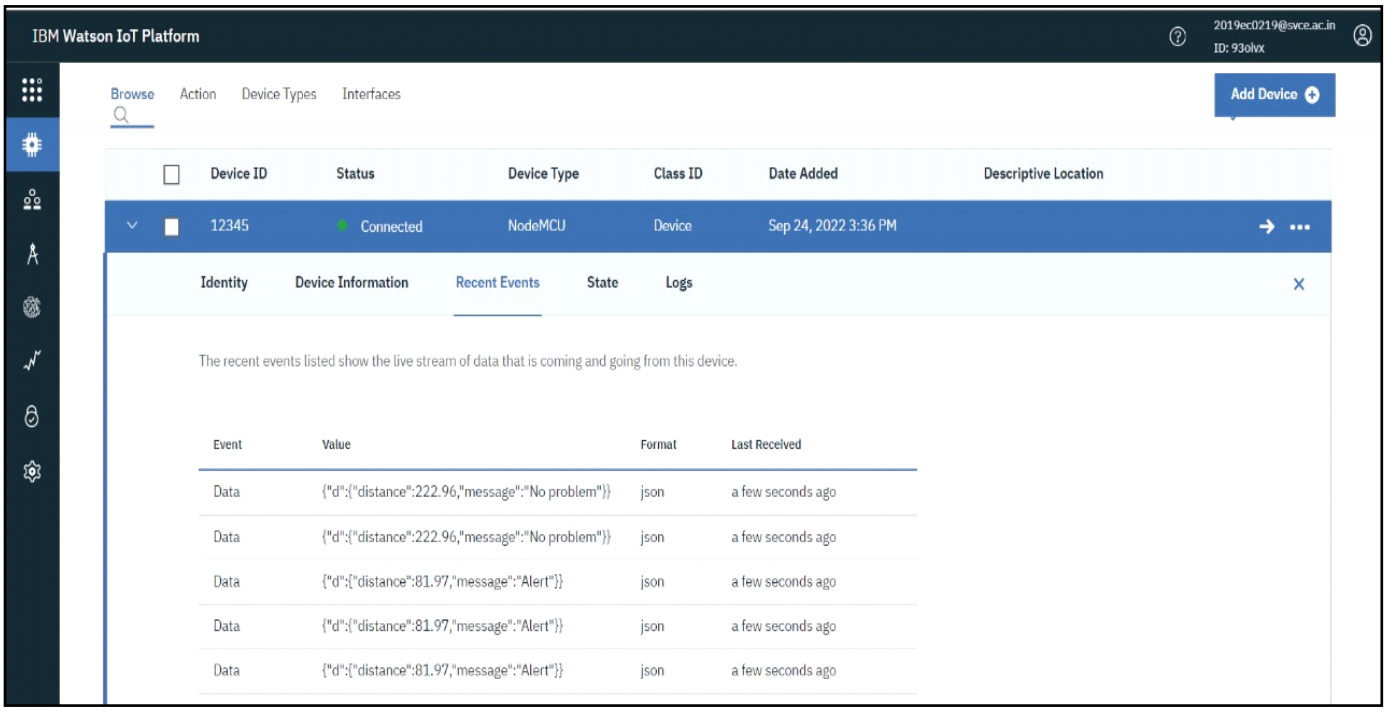
DEVICE RECENT EVENTS IN IBM WATSON:



WOKWI LINK:

https://wokwi.com/projects/347567479596253779