Assignment -4 Data
Pulish to IOT Device

Assignment Date	27 October 2022
Team ID	PNT2022TMID46063

Question-1:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less 100 cms send “alert” to ibm cloud and display in device recent events.

Solution:

```
#include <WiFi.h>//library for wifi

#include <PubSubClient.h>//library for MQtt


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


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


#define ORG "5qpnhq"//IBM ORGANITION ID

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

#define DEVICE_ID " weather1"//Device ID mentioned in ibm watson IOT Platform

#define TOKEN "?4I@lLnUpZttANL9MsJ&M"

//Token String data3; float dist;


//-------- 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/test/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


int LED = 4;
int trig = 5;
int echo = 18;
void setup()
{
Serial.begin(115200);
pinMode(trig,OUTPUT);
pinMode(echo,INPUT);
pinMode(LED, OUTPUT);
delay(10); wificonnect();
mqttconnect();
}
void loop()// Recursive Function
{
 digitalWrite(trig,LOW);
digitalWrite(trig,HIGH);
delayMicroseconds(10);
digitalWrite(trig,LOW);   float
dur = pulseIn(echo,HIGH);   float
dist = (dur * 0.0343)/2;
  Serial.print ("Distancein cm");
  Serial.println(dist);
  PublishData(dist);
delay(1000);   if
(!client.loop()) {
mqttconnect();
```

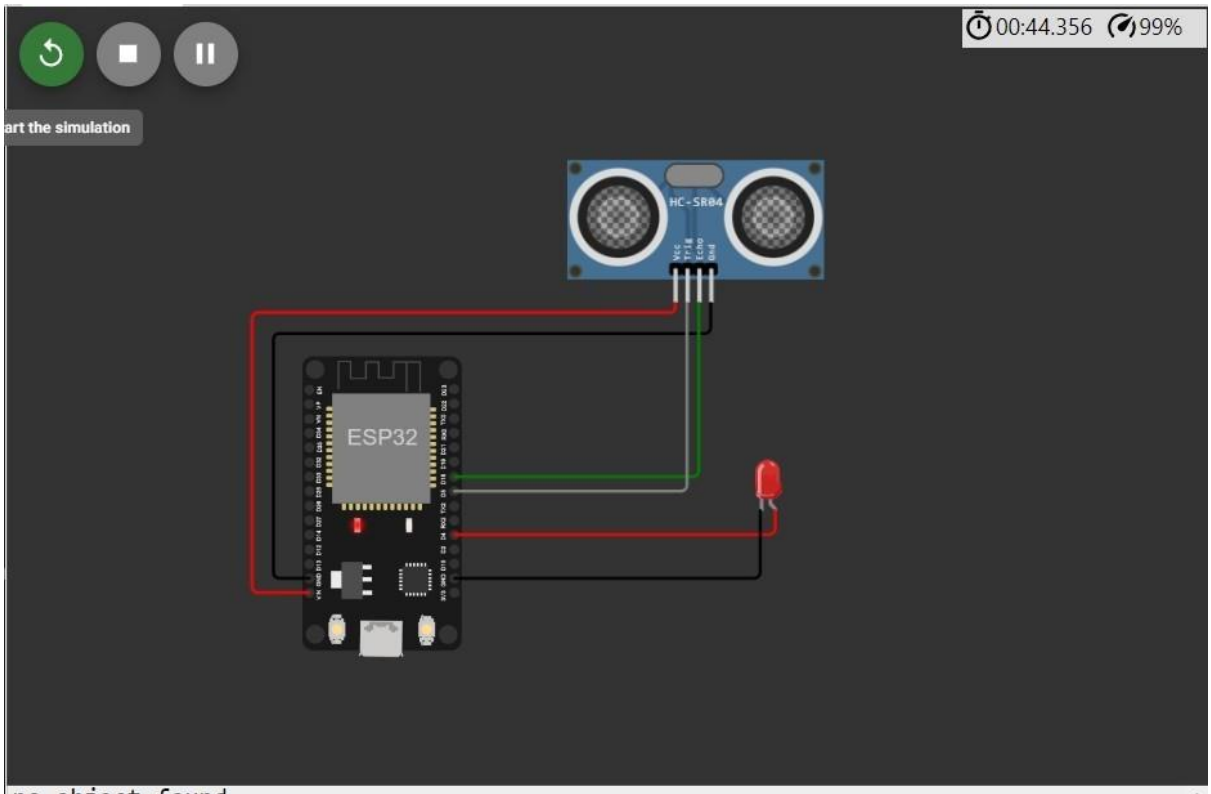
```
 }
}
/*.....retrieving to Cloud.....*/

void PublishData(float dist) {
mqttconnect();//function call for connecting to ibm
 /*     creating the String in in form JSon to update the data to ibm
cloud
 */  String
object;   if
(dist <100)
 {
   digitalWrite(LED,HIGH);
Serial.println("object is near");
object = "Near";
 }
 else
 {
   digitalWrite(LED,LOW);
Serial.println("no object found");
object = "No";
 }
 String payload = "{\"distance\":";
payload += dist;   payload += ","
"\"object\":\""; payload +=
object;   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
```

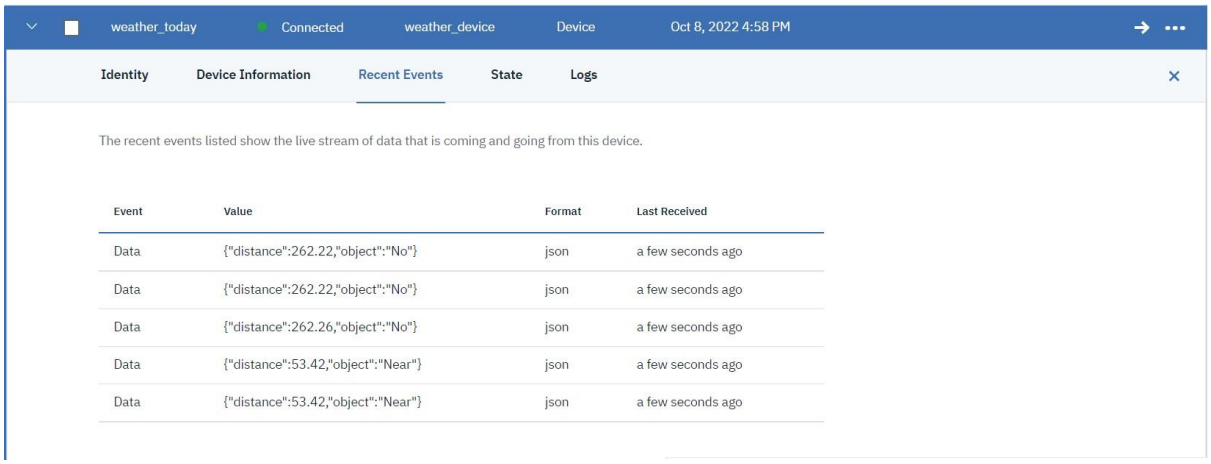
```
  } else {
    Serial.println("Publish failed");
  }
}
void mqttconnect() {   if
(!client.connected()) {
   Serial.print("Reconnecting client to ");
Serial.println(server);     while (!!!client.connect(clientId,
authMethod, token)) {      Serial.print(".");      delay(500);
   }
    initManagedDevice();
    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="";
}
```

Reference: https://wokwi.com/projects/346597491075973714




```
no object found
Sending payload: {"distance":335.90,"object":"No"}
Publish ok
Distancein cm335.90
no object found
Sending payload: {"distance":335.90,"object":"No"}
Publish ok
```



weather_today | Connected | weather_device | Device | Oct 8, 2022 4:58 PM

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	{"distance":262.22,"object":"No"}	json	a few seconds ago
Data	{"distance":262.22,"object":"No"}	json	a few seconds ago
Data	{"distance":262.26,"object":"No"}	json	a few seconds ago
Data	{"distance":53.42,"object":"Near"}	json	a few seconds ago
Data	{"distance":53.42,"object":"Near"}	json	a few seconds ago