Assignment -4

Data Publish to IOT Device

Assignment Date	27 October 2022
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Maximum Marks	2 Marks

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 "qxm592"//IBM ORGANITION ID
#define DEVICE_TYPE "weather_device"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "weather_today"//Device ID mentioned in ibm watson IOT Platform
#define   TOKEN   "jwSiUN+qppnF1*xTRa"   //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)
```

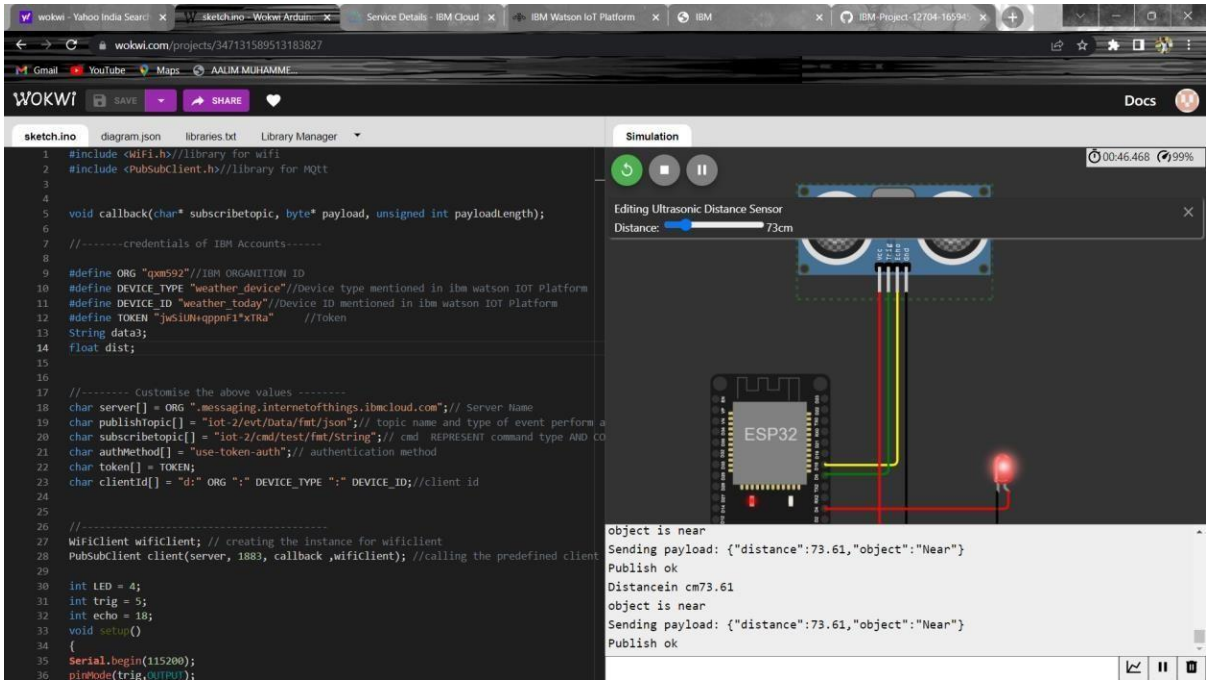
```
   { digitalWrite(LED,HIGH);
      Serial.println("object is near"); object = "Near";
   } else
   { digitalWrite(LED,LOW);
      Serial.println("no object found"); object = "No";
   }

   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
```

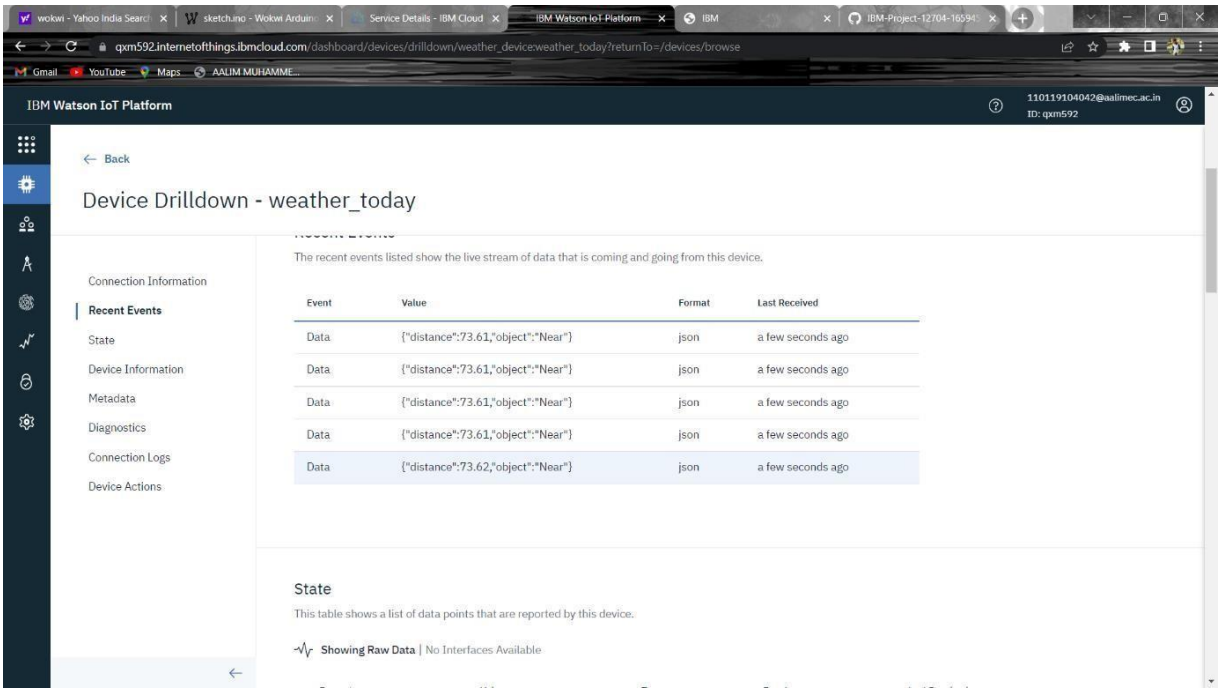
```
{
    Serial.println();
    Serial.print("Connecting to ");

    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];
    }

// Serial.println("data: "+ data3);
// if(data3=="Near")
// {
// Serial.println(data3);
// digitalWrite(LED,HIGH);

// }

// else
// {
// Serial.println(data3);
// digitalWrite(LED,LOW);
```

```
// }
data3="";


}
```

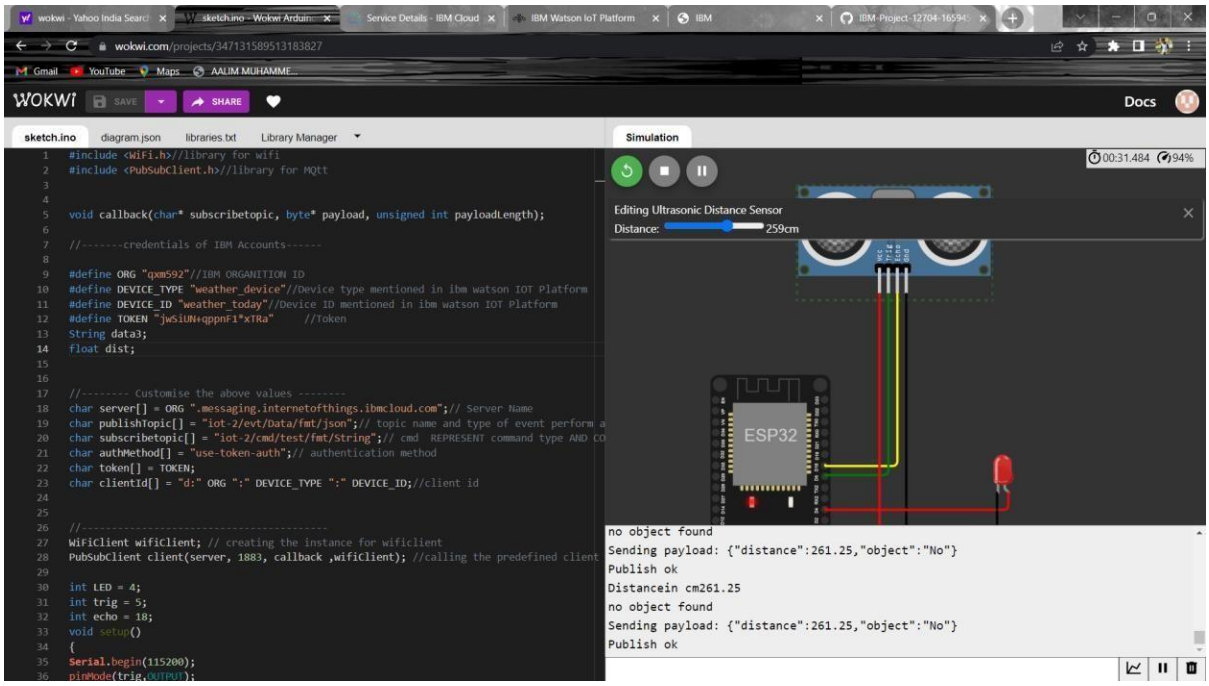
OUTPUT:

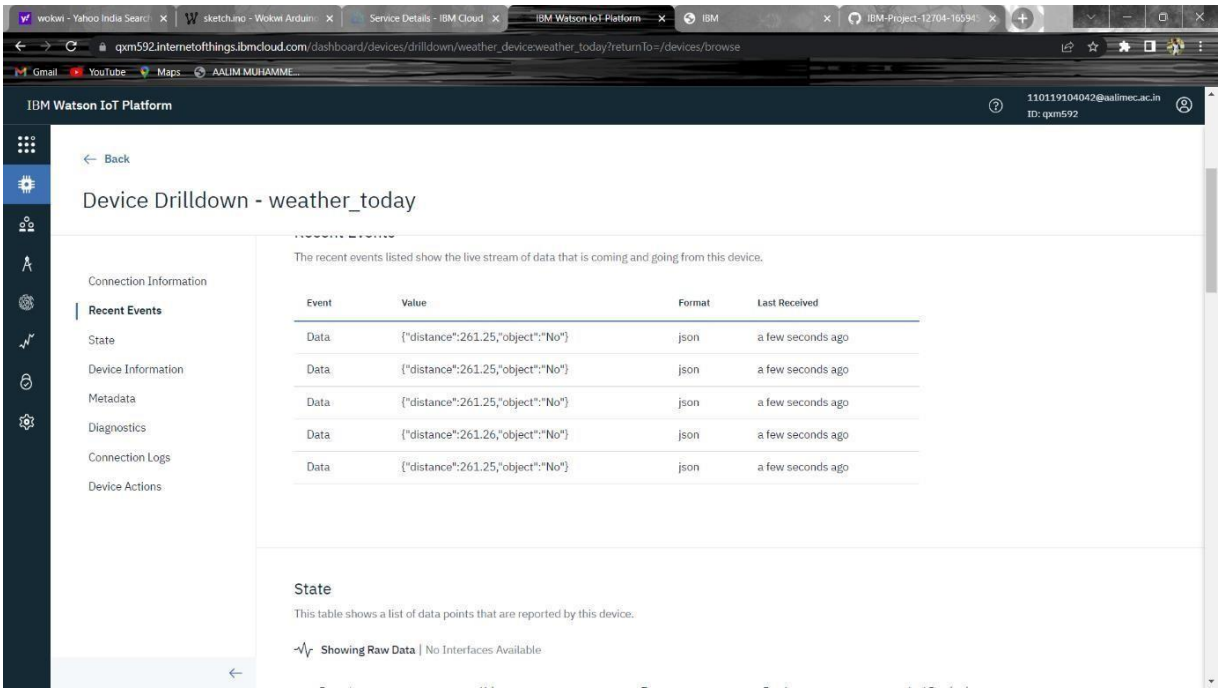
OBJECT NEAR BY DEVICE:





OBJECT FAR AWAY FROM DEVICE:





REFERENCE:
https://wokwi.com/projects/347211841025344084