ASSIGNMENT – 4

Name	**:**	**Harikrishnan N**
Date	**:**	**06-11-2022**
Team ID	**:**	**PNT2022TMID42243**
Register Number	**:**	**710019106301**
Project Title	**:**	**Smart Solutions for Railway**

CODE:

```
#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 "xlykki"//IBM ORGANITION ID

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

#define DEVICE_ID "710019106301"//Device ID mentioned in ibm watson IOT Platform

#define TOKEN "Hari@1508"     //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);

//   }

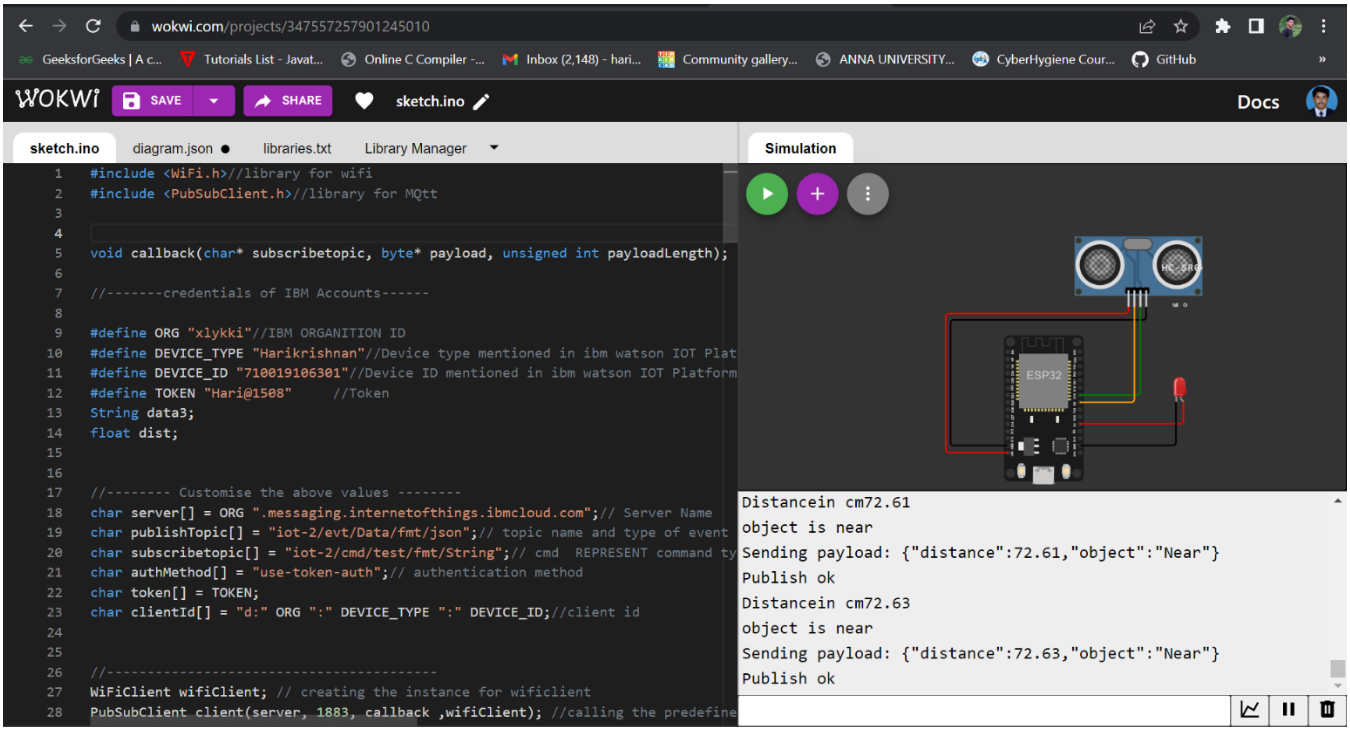
//   else
//   {
// Serial.println(data3);
// digitalWrite(LED,LOW);

//   }
data3="";

}
```

WOKWI LINK: https://wokwi.com/projects/347557257901245010

WOKWI OUTPUT :



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char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name
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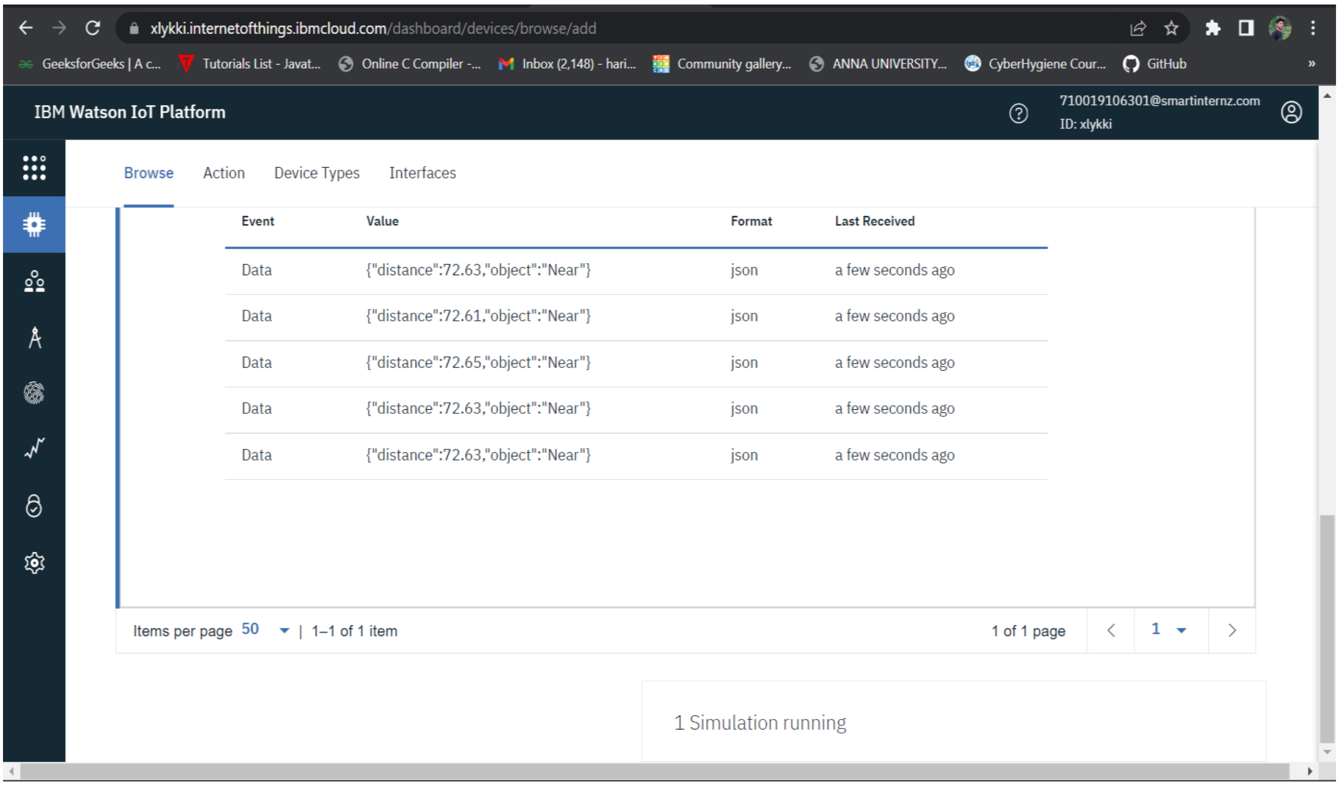
char subscribetopic[] = "iot-2/cmd/test/fmt/String";// cmd  REPRESENT command ty
char authMethod[] = "use-token-auth";// authentication method
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id


//-----------------------------------------
WiFiClient wifiClient; // creating the instance for wificlient
PubSubClient client(server, 1883, callback ,wifiClient); //calling the predefine
```

```
Distancein cm72.61
object is near
Sending payload: {"distance":72.61,"object":"Near"}
Publish ok
Distancein cm72.63
object is near
Sending payload: {"distance":72.63,"object":"Near"}
Publish ok
```

IBM CLOUD OUTPUT :


xlykki.internetofthings.ibmcloud.com/dashboard/devices/browse/add
IBM Watson IoT Platform
710019106301@smartinternz.com
ID: xlykki
Browse
Action
Device Types
Interfaces

Event	Value	Format	Last Received
Data	{"distance":72.63,"object":"Near"}	json	a few seconds ago
Data	{"distance":72.61,"object":"Near"}	json	a few seconds ago
Data	{"distance":72.65,"object":"Near"}	json	a few seconds ago
Data	{"distance":72.63,"object":"Near"}	json	a few seconds ago
Data	{"distance":72.63,"object":"Near"}	json	a few seconds ago

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1 Simulation running