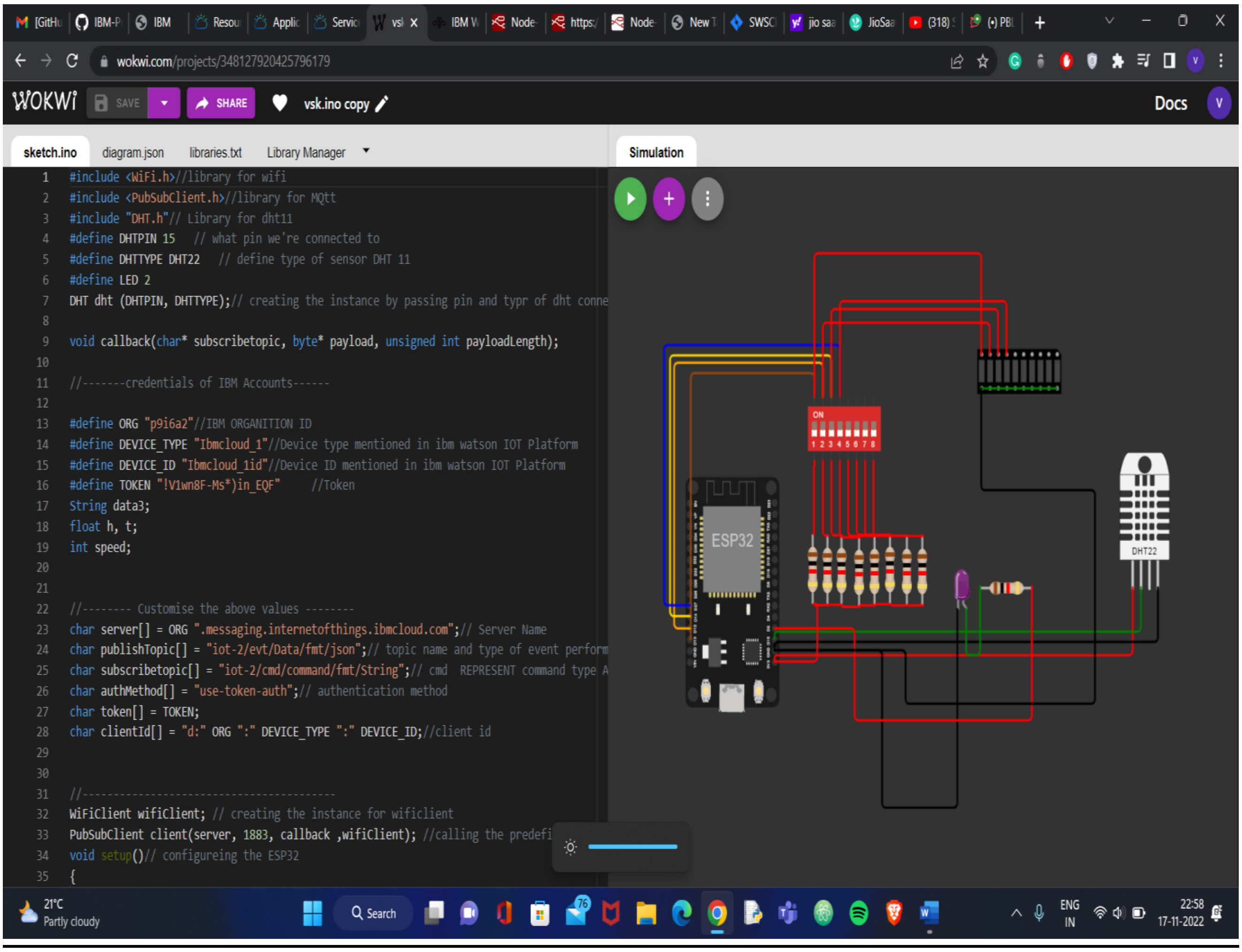
Sprint-1

Date	02 November 2022
Team ID	PNT2022TMID01100
Project Name	Project – Signs with smart connectivity for better safety.

Simulation Creation:



```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt
#include "DHT.h"// Library for dht11
#define DHTPIN 15   // what pin we're connected to
#define DHTTYPE DHT22   // define type of sensor DHT 11
#define LED 2
DHT dht (DHTPIN, DHTTYPE);// creating the instance by passing pin and typr of dht conne

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

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

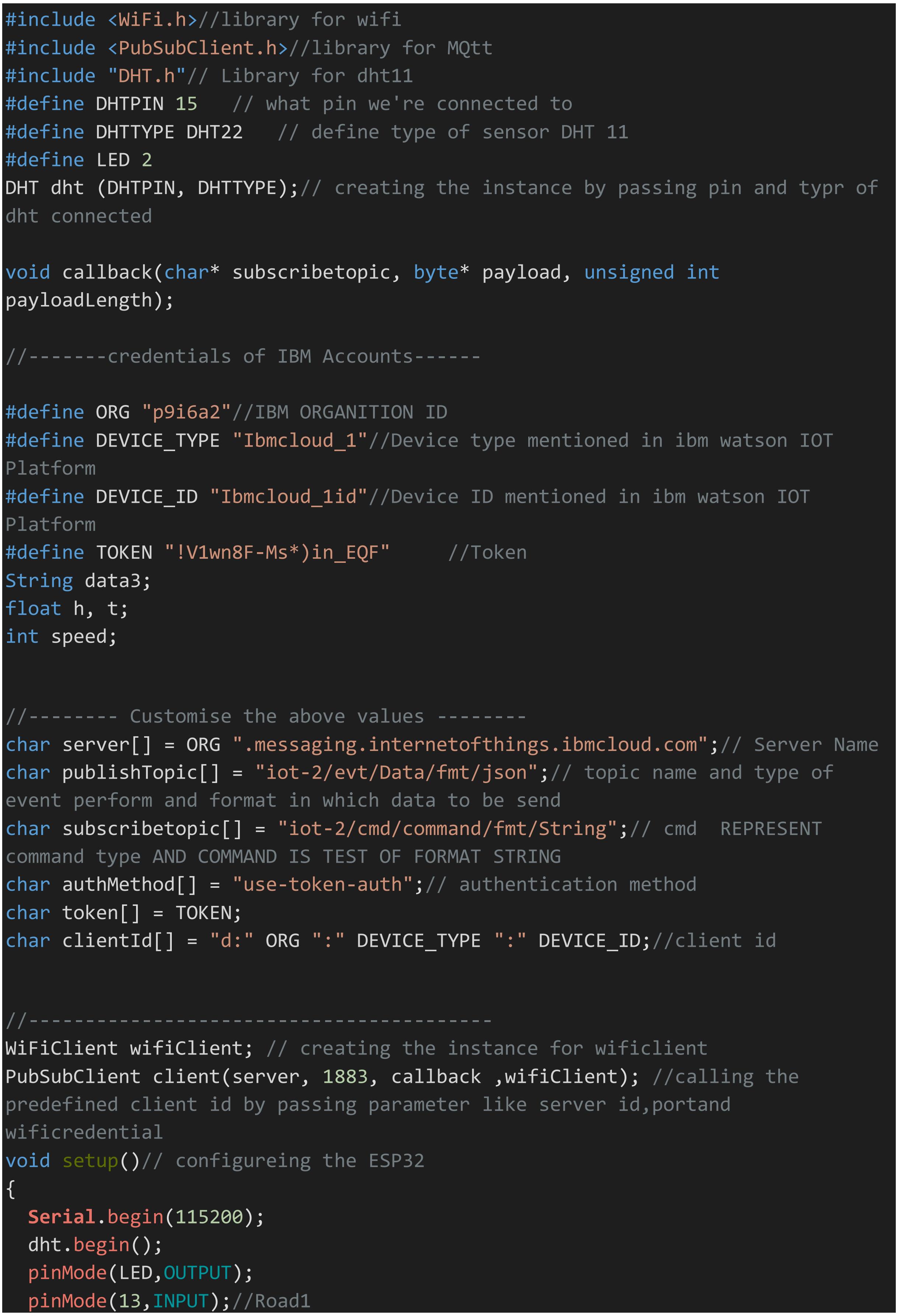
#define ORG "p9i6a2"//IBM ORGANITION ID
#define DEVICE_TYPE "Ibmcloud_1"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "Ibmcloud_1id"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "!V1wn8F-Ms*)in_EQF"     //Token
String data3;
float h, t;
int speed;


//-------- 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
char subscribetopic[] = "iot-2/cmd/command/fmt/String";// cmd  REPRESENT command type A
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 predefi
void setup()// configureing the ESP32
{
```

Wokwi simulation link:https://wokwi.com/projects/348127920425796179

Code:



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#define DHTPIN 15   // what pin we're connected to
#define DHTTYPE DHT22   // define type of sensor DHT 11
#define LED 2
DHT dht (DHTPIN, DHTTYPE);// creating the instance by passing pin and typr of
dht connected

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

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String data3;
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//-------- 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);
  dht.begin();
  pinMode(LED,OUTPUT);
  pinMode(13,INPUT);//Road1
  pinMode(12,INPUT);//Road2
  pinMode(14,INPUT);//Road3
  pinMode(27,INPUT);//Road4
 // pinMode(13,INPUT);
 // pinMode(13,INPUT);
  //pinMode(13,INPUT);
  //pinMode(13,INPUT);
  delay(10);
  Serial.println();
  wificonnect();
  mqttconnect();
}
int R1, R2, R3, R4;
void loop()// Recursive Function
{

  h = dht.readHumidity();
  t = dht.readTemperature();
  R1=digitalRead(13);
  R2=digitalRead(12);
  R3=digitalRead(14);
  R4=digitalRead(27);
  Serial.print("Temperature:");
  Serial.println(t);
  Serial.print("Humidity:");
  Serial.println(h);
  speed=round((h+t)/2);
  Serial.print("Speed:");
  Serial.println(speed);

  PublishData(t, h, speed, R1, R2 ,R3 ,R4);
  delay(1000);
  if (!client.loop()) {
    mqttconnect();
  }
}



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

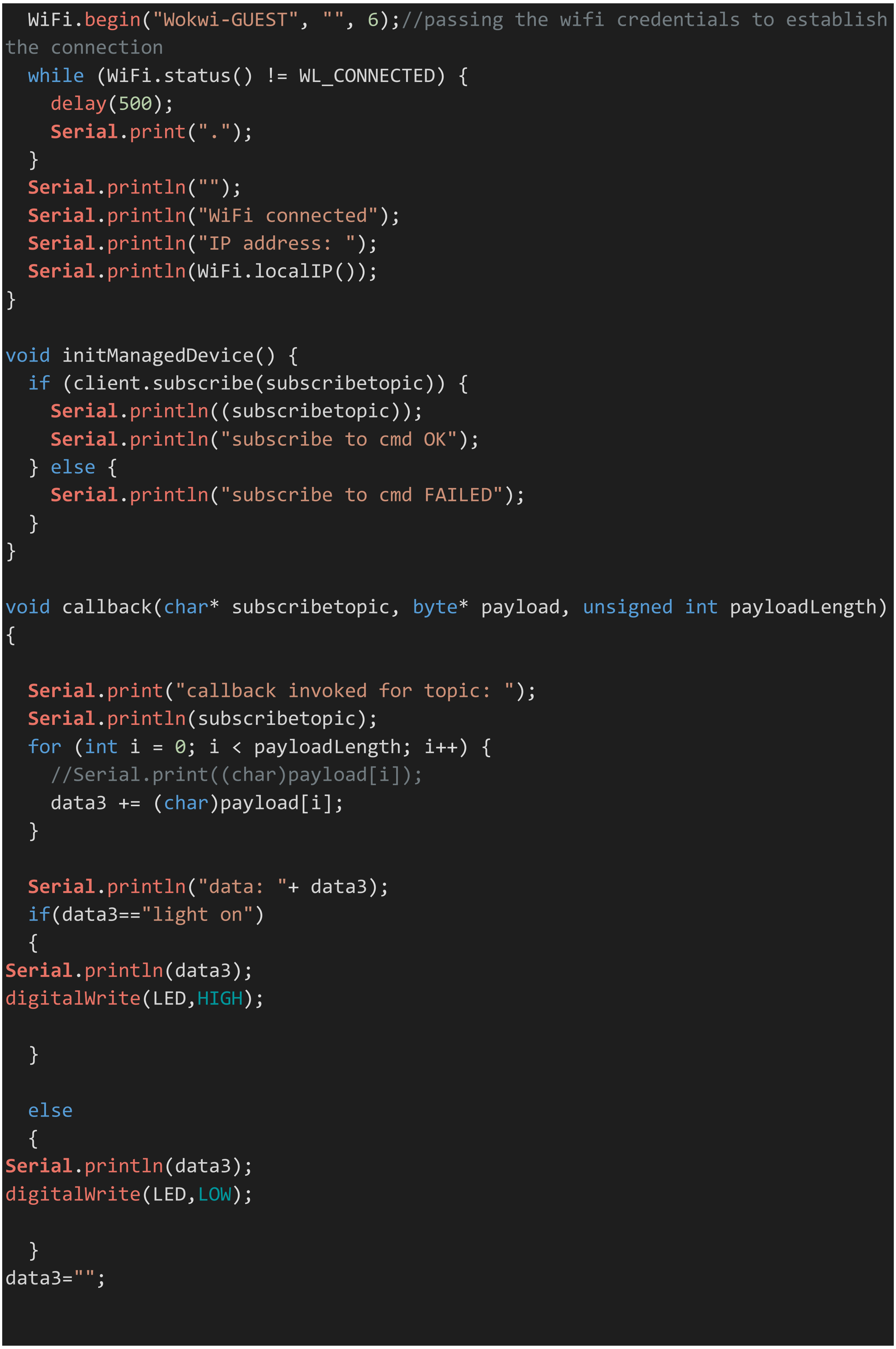
void PublishData(float temp, float humid, int speed, int R1, int R2, int R3,
int R4) {
  mqttconnect();//function call for connecting to ibm
  /*
     creating the String in in form JSon to update the data to ibm cloud
  */
  String payload = "{\"Temperature\":";
  payload += temp;
  payload += "," "\"Humidity\":";
  payload += humid;
  payload += "," "\"Speed\":";
  payload += speed;
  payload += "," "\"Road1\":";
  payload += R1;
  payload += "," "\"Road2\":";
  payload += R2;
  payload += "," "\"Road3\":";
  payload += R3;
  payload +="," "\"Road4\":";
  payload += R4;
  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=="light on")
  {
Serial.println(data3);
digitalWrite(LED,HIGH);

  }

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

  }
data3="";
```

```
}
```