IBM ASSIGNMENT – 4

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

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

#define ECHO_PIN 2

#define TRIG_PIN 4

#define LED 5



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


#define ORG "b9o6f6"//IBM ORGANITION ID

#define DEVICE_TYPE "esp32"//Device type mentioned in ibm watson IOT Platform

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

#define TOKEN "7fh8bKomzZ_+@Q44p0"     //Token




//-------- 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
```

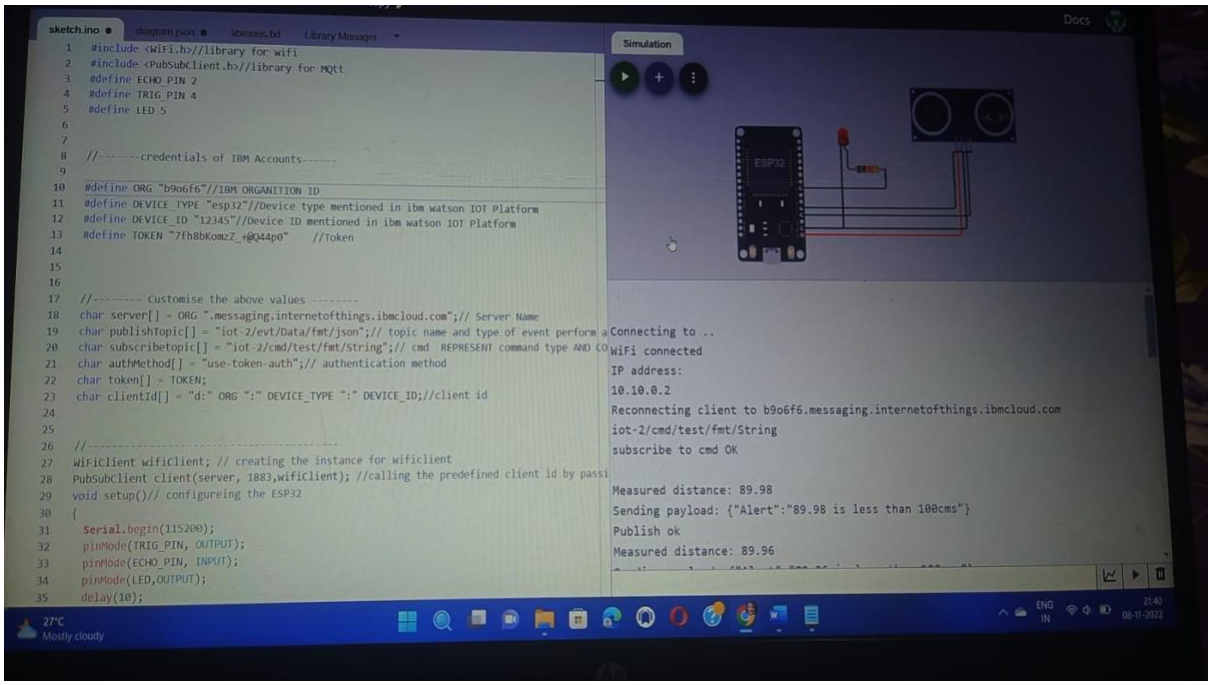
```
PubSubClient client(server, 1883,wifiClient); //calling the predefined client id by passing parameter like server id,portand wificredential

void setup()// configureing the ESP32

{

  Serial.begin(115200);

  pinMode(TRIG_PIN, OUTPUT);

  pinMode(ECHO_PIN, INPUT);

  pinMode(LED,OUTPUT);

  delay(10);

  Serial.println();

  wificonnect();

  mqttconnect();

}


float readDistanceCM() {

  digitalWrite(TRIG_PIN, LOW);

  delayMicroseconds(2);

  digitalWrite(TRIG_PIN, HIGH);

  delayMicroseconds(10);

  digitalWrite(TRIG_PIN, LOW);

  int duration = pulseIn(ECHO_PIN, HIGH);

  return duration * 0.034 / 2;

}



void loop()// Recursive Function

{

  float distance = readDistanceCM();

  bool isNearby = distance < 100;

  digitalWrite(LED, isNearby);

  Serial.print("Measured distance: ");
```

```
  Serial.println(distance);
  delay(100);
  if (isNearby == 1){
  PublishData(distance);
  }
  delay(1000);
  if (!client.loop()) {
    mqttconnect();
  }
}



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

void PublishData(float distance) {
  mqttconnect();//function call for connecting to ibm
  /*
     creating the String in in form JSon to update the data to ibm cloud
  */
  String payload = "{\"Alert\":""\"";
  payload += distance;
  payload += " is less than 100cms\"";
  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");
  }
}
```

Picture:-



Link: -

https://wokwi.com/projects/347777321684435539

Cloud Output: -