Assignment -4

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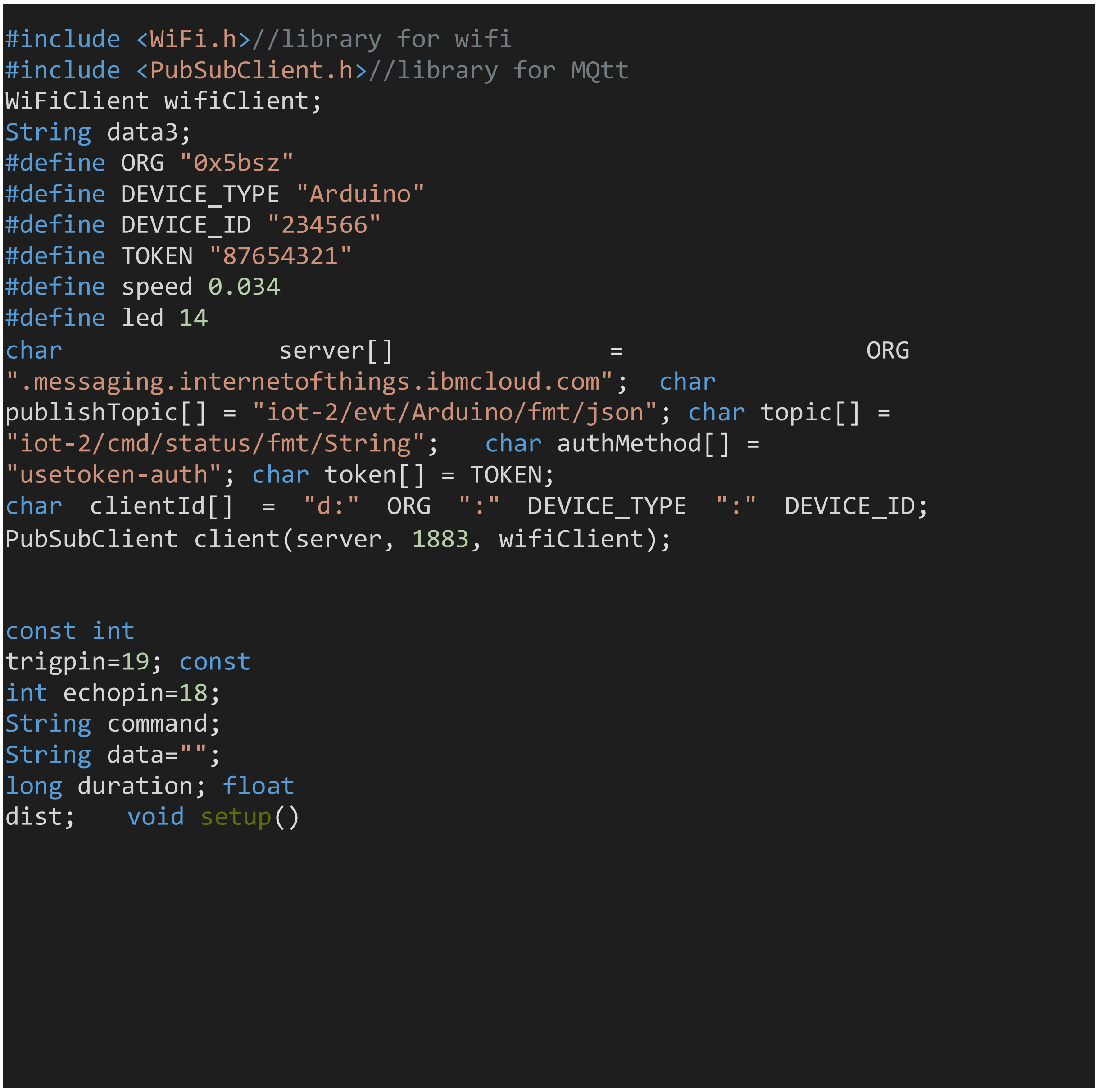
Project Name	Smart Waste Management System for Metropolitan Cities.

Question:

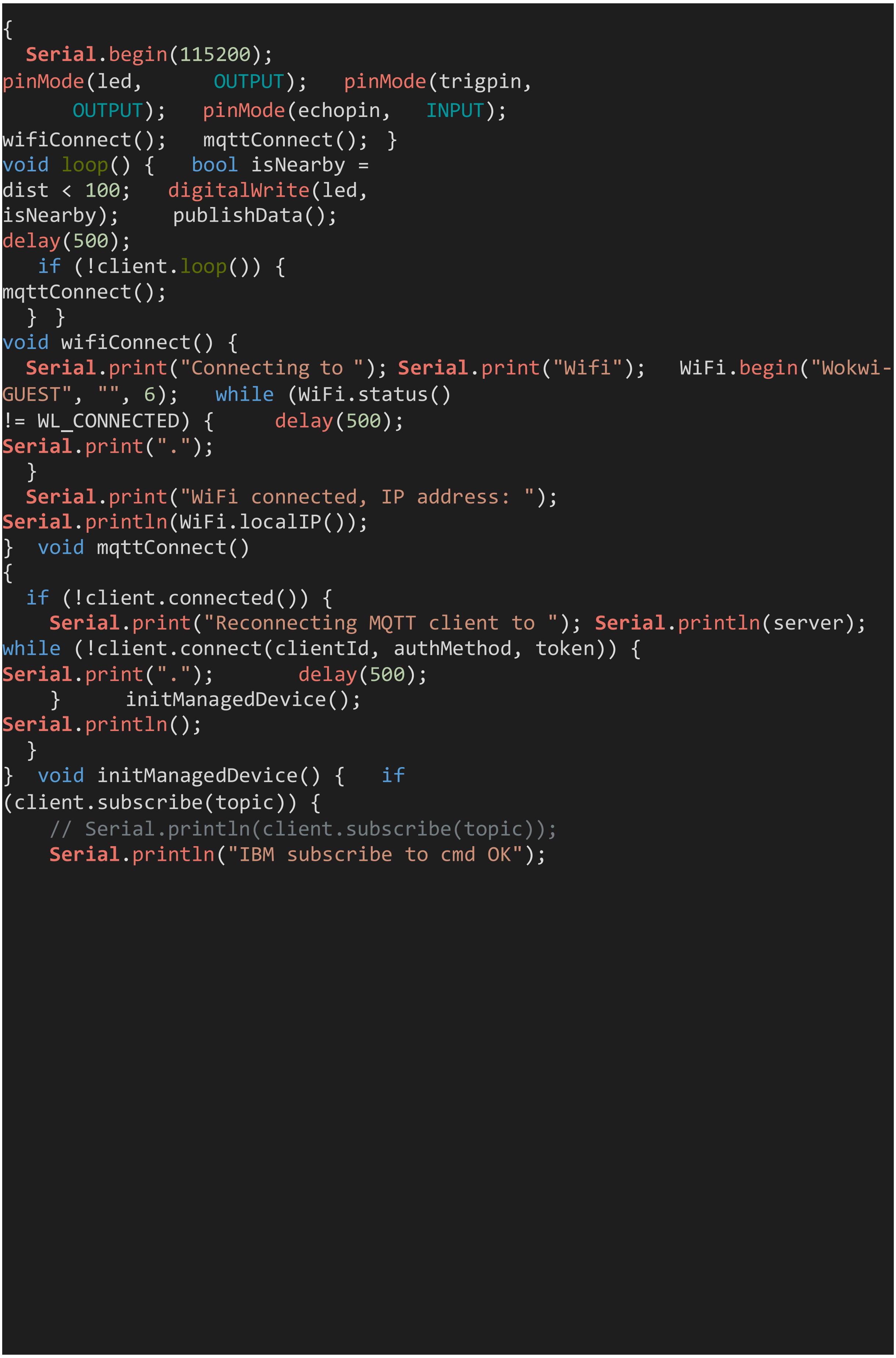
Write a Code and Connections in wokwi for **ultrasonic sensor**. Whenever distance is less than 100 cms send **“alert”** to ibm cloud and display in device recent events.

Code :

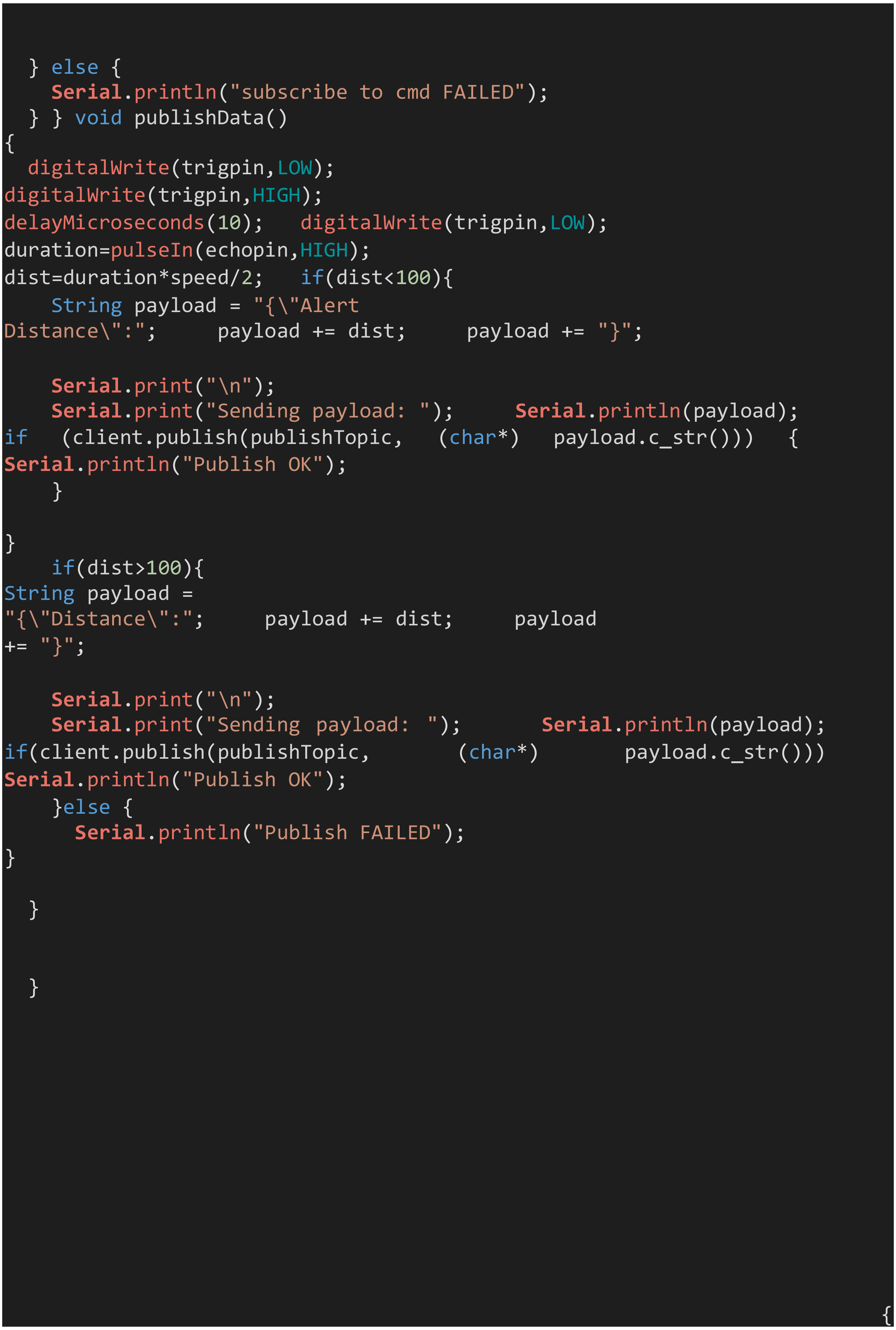


```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt
WiFiClient wifiClient;
String data3;
#define ORG "0x5bsz"
#define DEVICE_TYPE "Arduino"
#define DEVICE_ID "234566"
#define TOKEN "87654321"
#define speed 0.034
#define led 14
char               server[]               =                ORG
".messaging.internetofthings.ibmcloud.com";  char
publishTopic[] = "iot-2/evt/Arduino/fmt/json"; char topic[] =
"iot-2/cmd/status/fmt/String";   char authMethod[] =
"usetoken-auth"; char token[] = TOKEN;
char  clientId[]  =  "d:"  ORG  ":"  DEVICE_TYPE  ":"  DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);


const int
trigpin=19; const
int echopin=18;
String command;
String data="";
long duration; float
dist;    void setup()
```

[redacted]



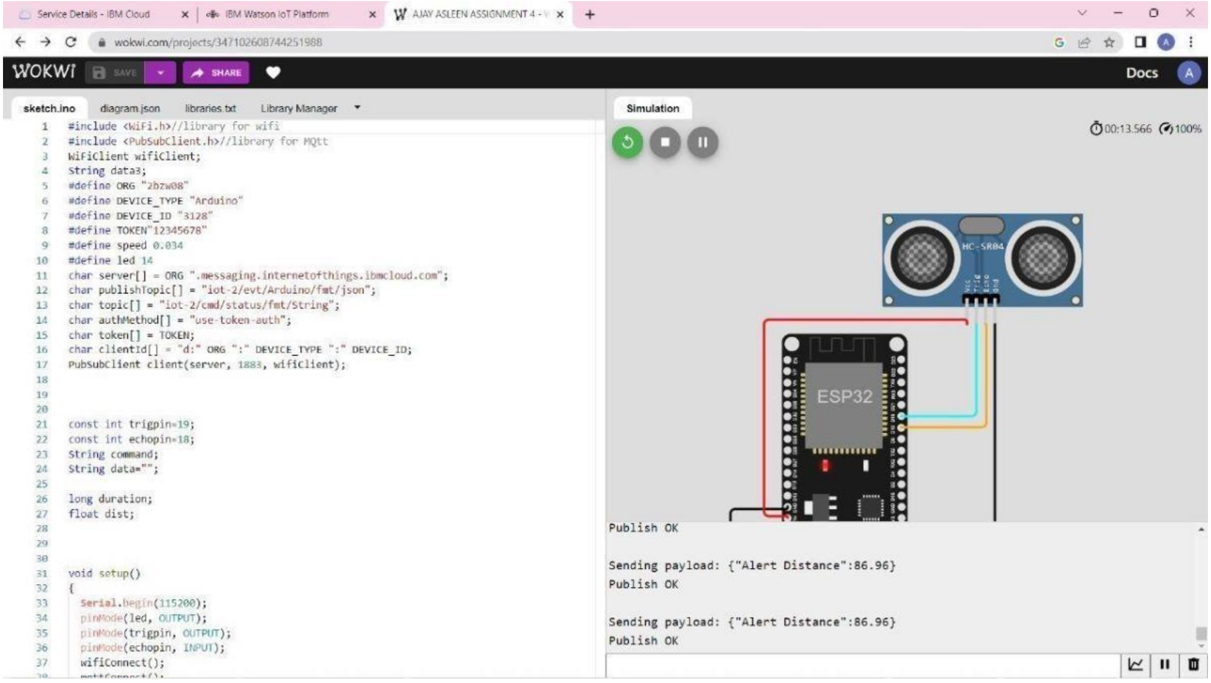
```
{
  Serial.begin(115200);
pinMode(led,      OUTPUT);   pinMode(trigpin,
      OUTPUT);   pinMode(echopin,   INPUT);
wifiConnect();   mqttConnect();  }
void loop() {   bool isNearby =
dist < 100;   digitalWrite(led,
isNearby);     publishData();
delay(500);
   if (!client.loop()) {
mqttConnect();
  }  }
void wifiConnect() {
  Serial.print("Connecting to "); Serial.print("Wifi");   WiFi.begin("Wokwi-
GUEST", "", 6);   while (WiFi.status()
!= WL_CONNECTED) {     delay(500);
Serial.print(".");
  }
  Serial.print("WiFi connected, IP address: ");
Serial.println(WiFi.localIP());
}  void mqttConnect()
{
  if (!client.connected()) {
    Serial.print("Reconnecting MQTT client to "); Serial.println(server);
while (!client.connect(clientId, authMethod, token)) {
Serial.print(".");       delay(500);
    }      initManagedDevice();
Serial.println();
  }
}  void initManagedDevice() {   if
(client.subscribe(topic)) {
    // Serial.println(client.subscribe(topic));
    Serial.println("IBM subscribe to cmd OK");
```



```
  } else {
    Serial.println("subscribe to cmd FAILED");
  } } void publishData()
{
  digitalWrite(trigpin,LOW);
digitalWrite(trigpin,HIGH);
delayMicroseconds(10);   digitalWrite(trigpin,LOW);
duration=pulseIn(echopin,HIGH);
dist=duration*speed/2;   if(dist<100){
    String payload = "{\"Alert
Distance\":";     payload += dist;     payload += "}";

    Serial.print("\n");
    Serial.print("Sending payload: ");     Serial.println(payload);
if   (client.publish(publishTopic,   (char*)   payload.c_str()))   {
Serial.println("Publish OK");
    }

}
    if(dist>100){
String payload =
"{\"Distance\":";     payload += dist;     payload
+= "}";

    Serial.print("\n");
    Serial.print("Sending payload: ");      Serial.println(payload);
if(client.publish(publishTopic,       (char*)       payload.c_str()))
Serial.println("Publish OK");
    }else {
      Serial.println("Publish FAILED");
}

  }


  }
                                                                            {
```

OUTPUT:

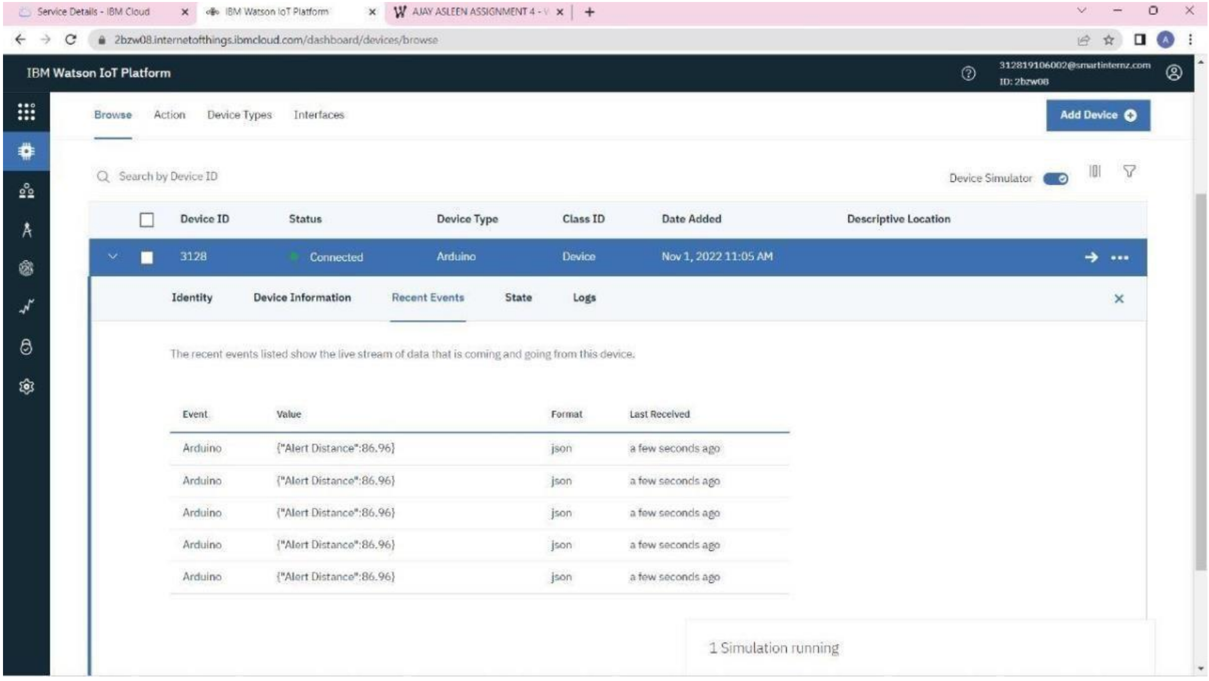
1) When distance is less than 100 cm



```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt
WiFiClient wifiClient;
String data3;
#define ORG "2bzw08"
#define DEVICE_TYPE "Arduino"
#define DEVICE_ID "3128"
#define TOKEN"12345678"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Arduino/fmt/json";
char topic[] = "iot-2/cmd/status/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);



const int trigpin=19;
const int echopin=18;
String command;
String data="";

long duration;
float dist;



void setup()
{
  Serial.begin(115200);
  pinMode(led, OUTPUT);
  pinMode(trigpin, OUTPUT);
  pinMode(echopin, INPUT);
  wifiConnect();
  mqttConnect();
```

```
Publish OK

Sending payload: {"Alert Distance":86.96}
Publish OK

Sending payload: {"Alert Distance":86.96}
Publish OK
```

IBM RECENT EVENTS:

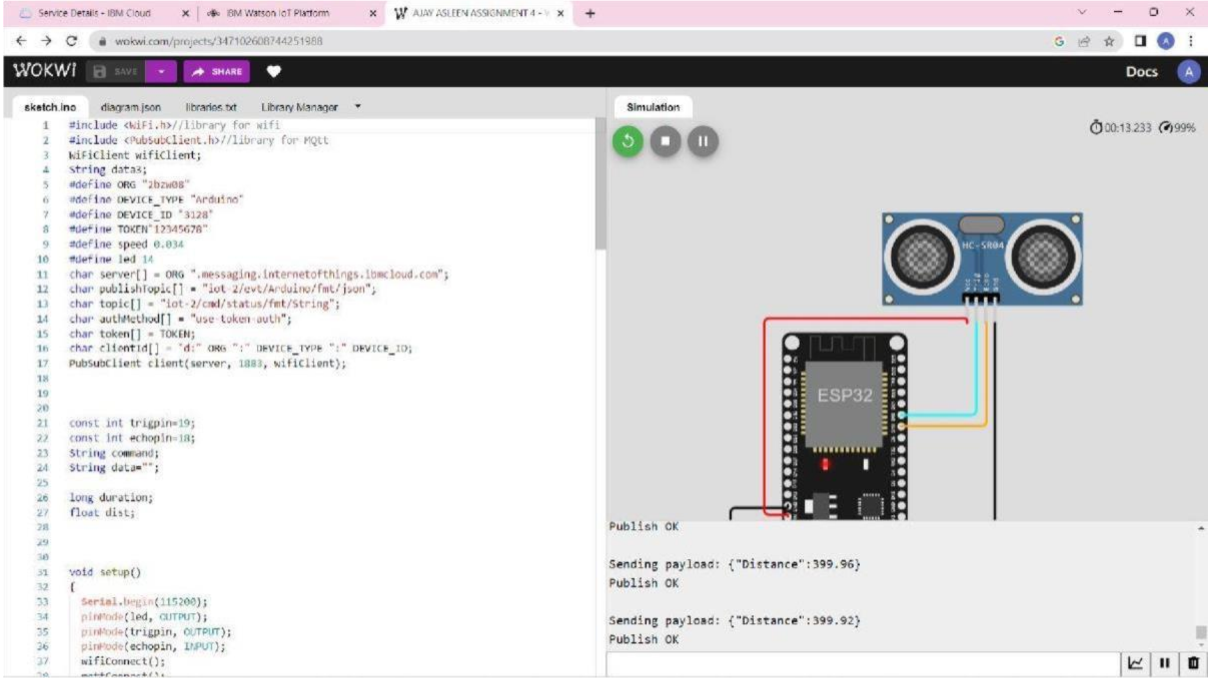


Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
3128	Connected	Arduino	Device	Nov 1, 2022 11:05 AM	

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Arduino	{"Alert Distance":86.96}	json	a few seconds ago
Arduino	{"Alert Distance":86.96}	json	a few seconds ago
Arduino	{"Alert Distance":86.96}	json	a few seconds ago
Arduino	{"Alert Distance":86.96}	json	a few seconds ago
Arduino	{"Alert Distance":86.96}	json	a few seconds ago

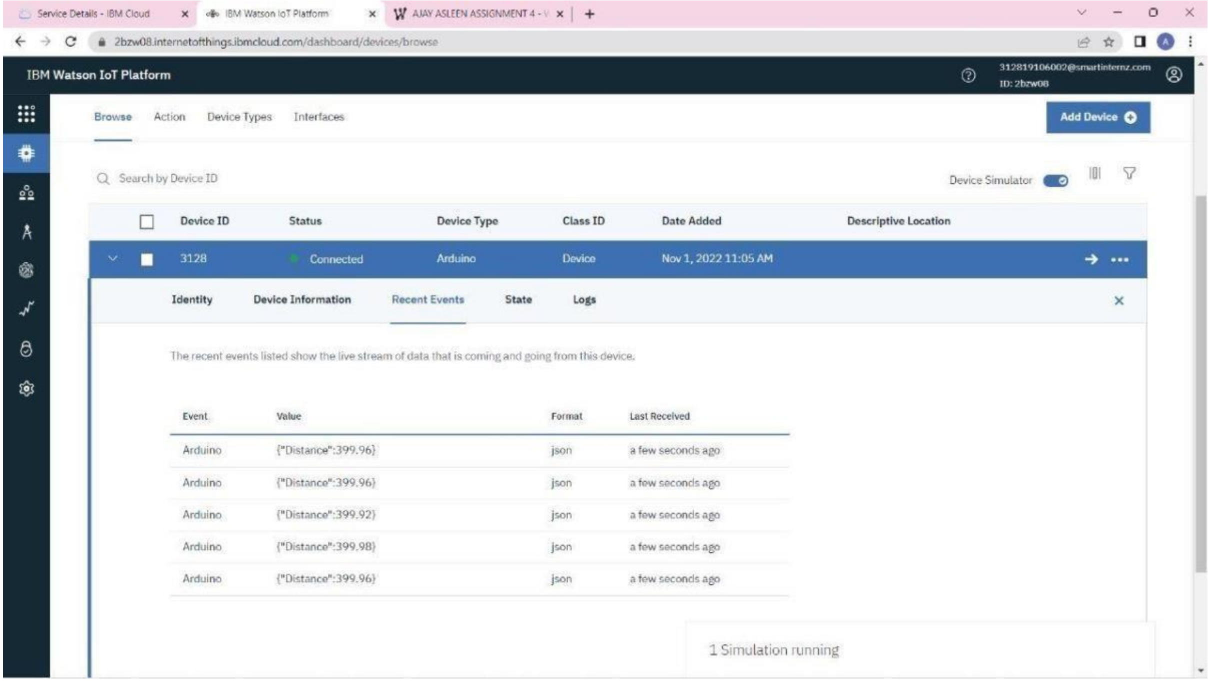
2)When distance is greater than 100 cm



```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt
WiFiClient wifiClient;
String data3;
#define ORG "2bzw08"
#define DEVICE_TYPE "Arduino"
#define DEVICE_ID "3128"
#define TOKEN"12345678"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Arduino/fmt/json";
char topic[] = "iot-2/cmd/status/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);



const int trigpin=19;
const int echopin=18;
String command;
String data="";

long duration;
float dist;



void setup()
{
  Serial.begin(115200);
  pinMode(led, OUTPUT);
  pinMode(trigpin, OUTPUT);
  pinMode(echopin, INPUT);
  wifiConnect();
```

```
Publish OK

Sending payload: {"Distance":399.96}
Publish OK

Sending payload: {"Distance":399.92}
Publish OK
```

IBM RECENT EVENTS:



Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
3128	Connected	Arduino	Device	Nov 1, 2022 11:05 AM	

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Arduino	{"Distance":399.96}	json	a few seconds ago
Arduino	{"Distance":399.96}	json	a few seconds ago
Arduino	{"Distance":399.92}	json	a few seconds ago
Arduino	{"Distance":399.98}	json	a few seconds ago
Arduino	{"Distance":399.96}	json	a few seconds ago