Assignment -4

Assignment Date	**19 October 2022**
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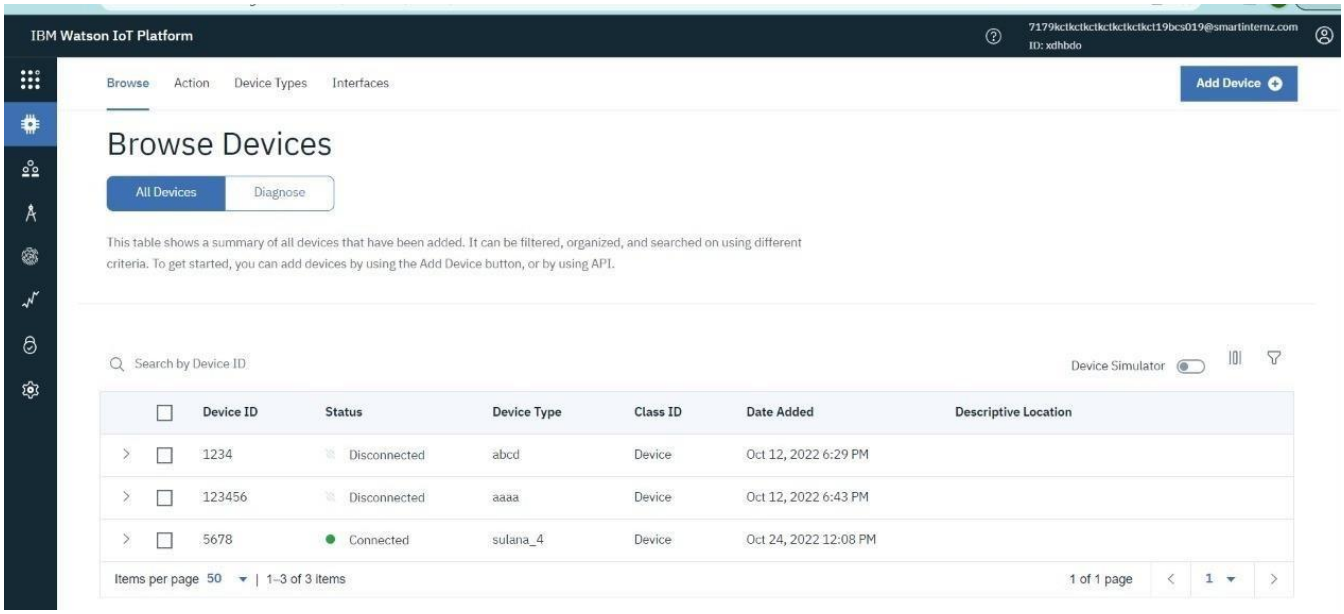
Write code and connection in Wowki for ultrasonic sensor.

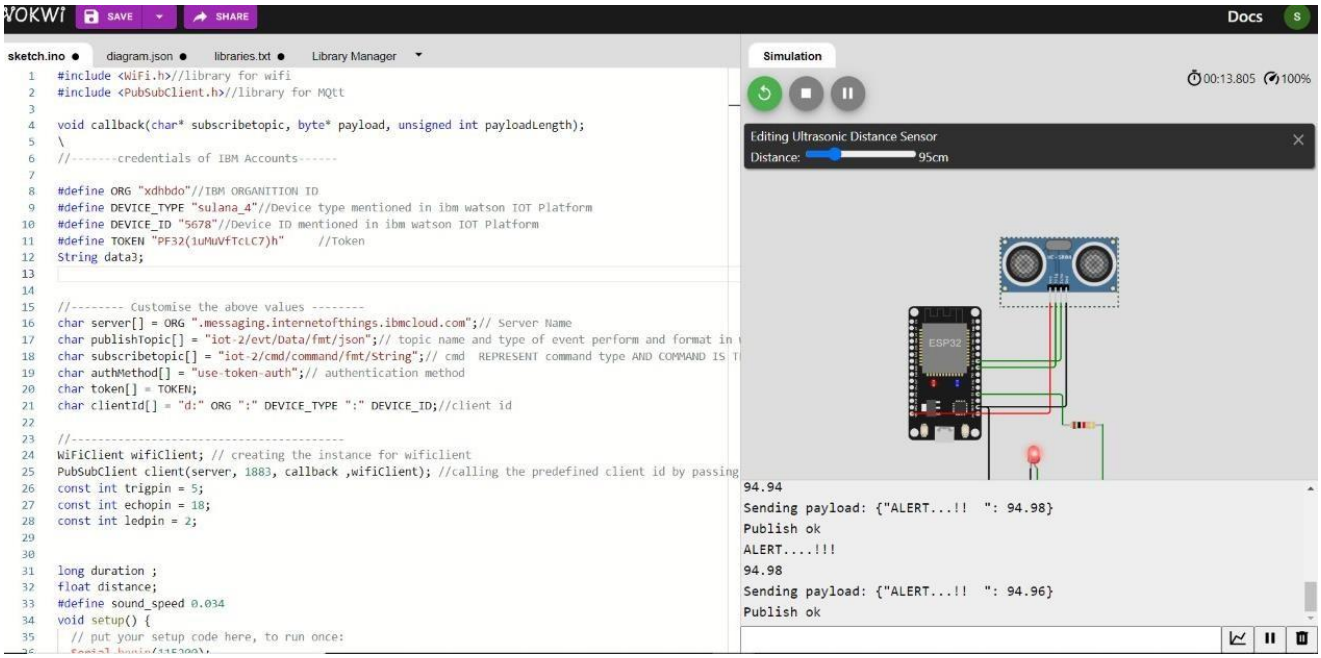
Whenever distance is less than 100 cm send “Alert” to IBM cloud and display in device recent events

Wowki link: https://wokwi.com/projects/new/esp32

Step 1 : Add new device in IBM cloud



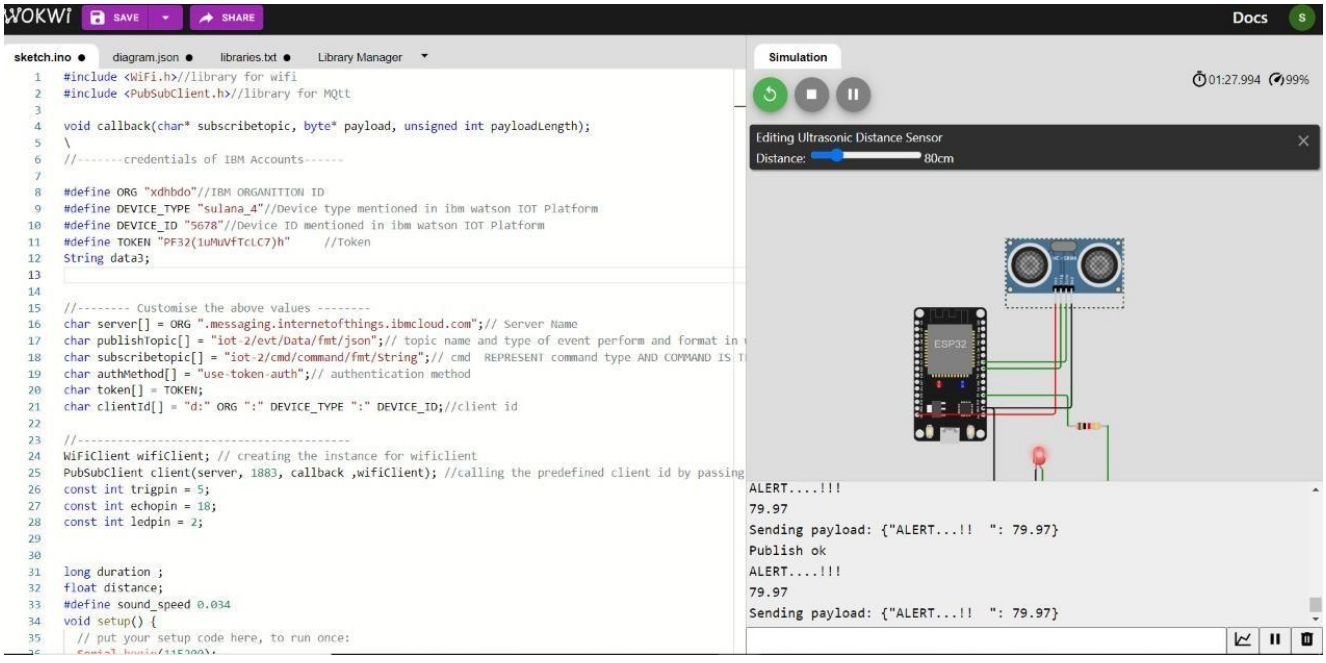
Step 2: Complete the Circuit and run the program




```
#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 "xdhbdo"//IBM ORGANITION ID
#define DEVICE_TYPE "sulana_4"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "5678"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "PF32(1uMuVfTcLC7)h"      //Token
String data3;


//-------- 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
char subscribetopic[] = "iot-2/cmd/command/fmt/String";// cmd  REPRESENT command type AND COMMAND IS
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
const int trigpin = 5;
const int echopin = 18;
const int ledpin = 2;


long duration ;
float distance;
#define sound_speed 0.034
void setup() {
  // put your setup code here, to run once:
```

Output in WOWKI

a) when the distance is below 100 cms




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

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
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//-------credentials of IBM Accounts------

#define ORG "xdhbdo"//IBM ORGANITION ID
#define DEVICE_TYPE "sulana_4"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "5678"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "PF32(1uMuVfTcLC7)h"      //Token
String data3;


//-------- 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
char subscribetopic[] = "iot-2/cmd/command/fmt/String";// cmd  REPRESENT command type AND COMMAND IS
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
const int trigpin = 5;
const int echopin = 18;
const int ledpin = 2;


long duration ;
float distance;
#define sound_speed 0.034
void setup() {
  // put your setup code here, to run once:
```
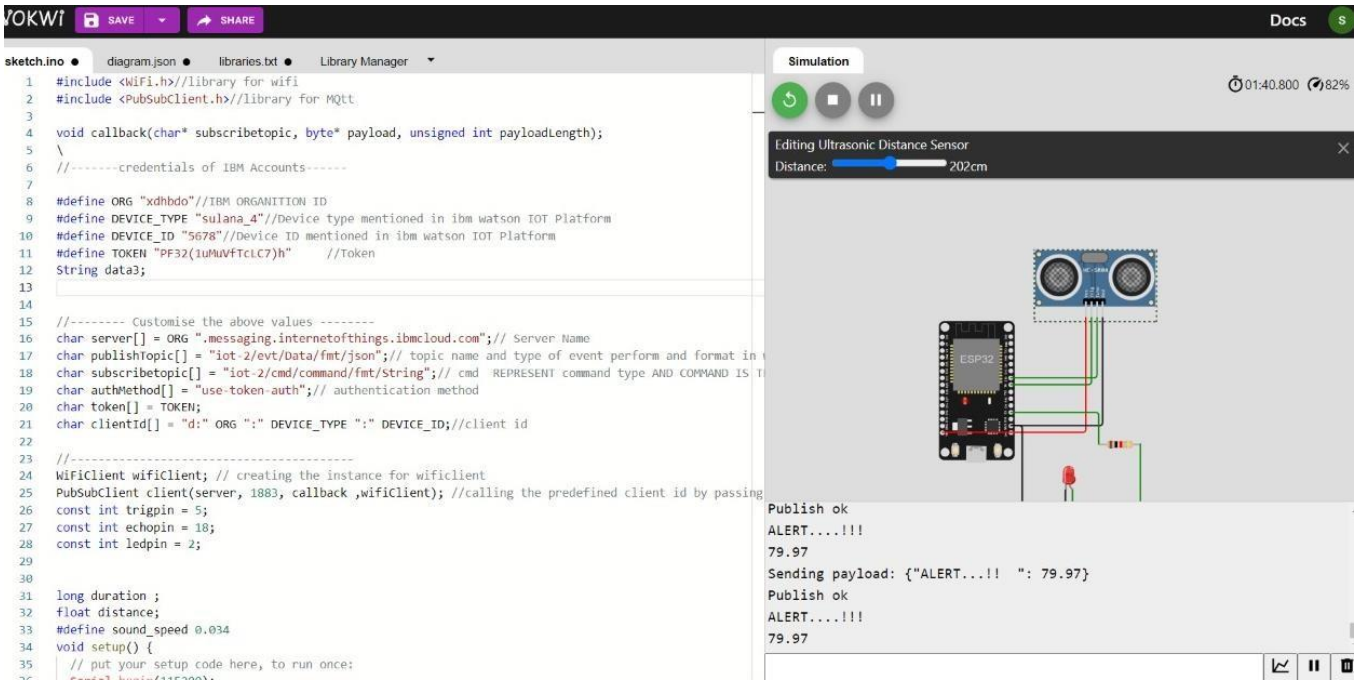
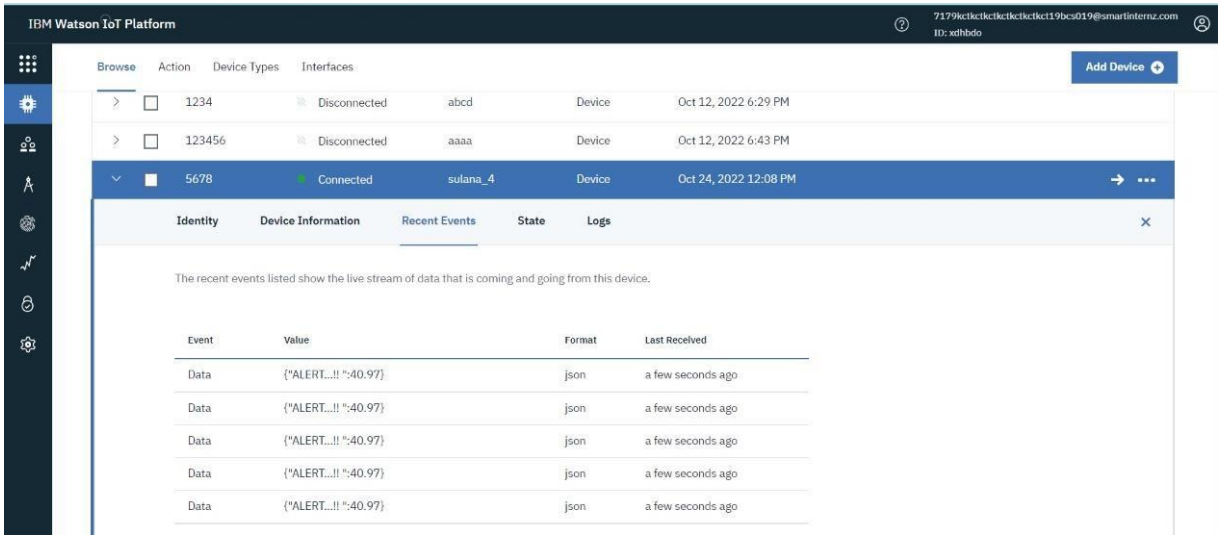

b) when the distance is above 100 cms ,(no alert message is displayed here for 202 cm)



Output in IBM CLOUD (Watson Platform)

Displayed in device recent events



Program:

```
#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 "xdhbdo"//IBM ORGANITION ID
#define DEVICE_TYPE "sulana_4"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "5678"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "PF32(1uMuVfTcLC7)h"     //Token
String data3;
//-------- 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
const int trigpin = 5;
const int echopin = 18;
const int ledpin = 2;

 long duration ;
float distance;
#define sound_speed 0.034
void setup() {
  // put your setup code here, to run once:
  Serial.begin(115200);
  pinMode(trigpin, OUTPUT);
  pinMode(echopin, OUTPUT);
  pinMode(ledpin, OUTPUT);
  wificonnect();
  mqttconnect();
}

void loop() {
  digitalWrite(trigpin, LOW);
  digitalWrite(trigpin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigpin, LOW);

  duration= pulseIn(echopin,HIGH);
  distance = duration * sound_speed /2;
  if(distance<=100){
  PublishData(distance);
  delay(1000);
  if (!client.loop()) {
```

```
   mqttconnect();
  }
   digitalWrite(ledpin, HIGH);
   Serial.println("ALERT... !!!");
   Serial.println(distance);
  }
  else
  {
   digitalWrite(ledpin, LOW);
  }
  // put your main code here, to run repeatedly:
  delay(10); // this speeds up the simulation
}
/*.....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 += "}";

  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=="lighton")
 {
    Serial.println(data3);
 }
 else
 {
    Serial.println(data3);
 }
data3="";
}
```