Assignment -4

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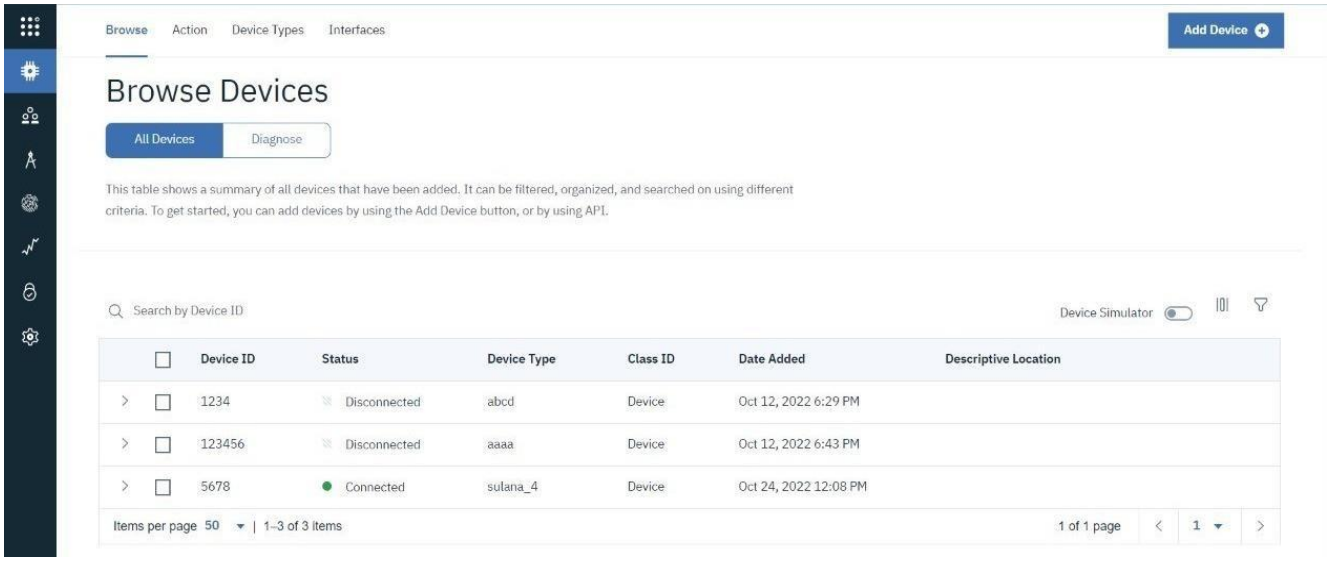
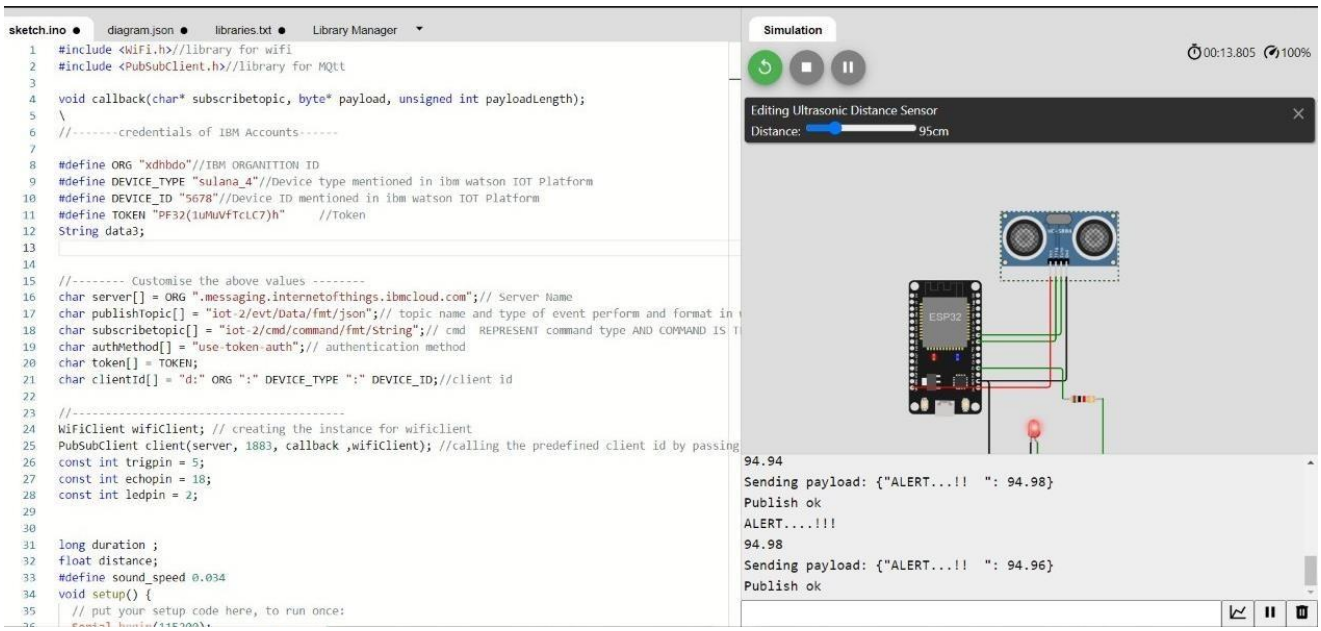
Write code and connection in Wowki for ultrasonic sensor.

Whenever distance is less than 100 cm send "Alert" to IBM cloud and display

Step 1 : Add new device in IBM cloud

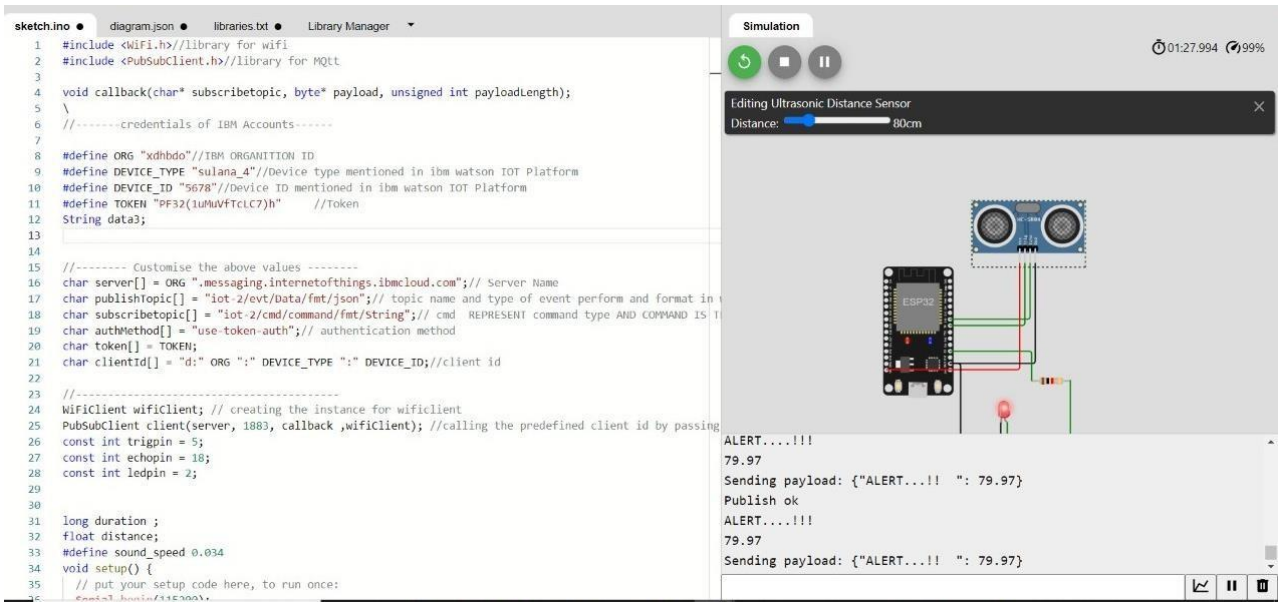


Step 2: Complete the Circuit and run the program

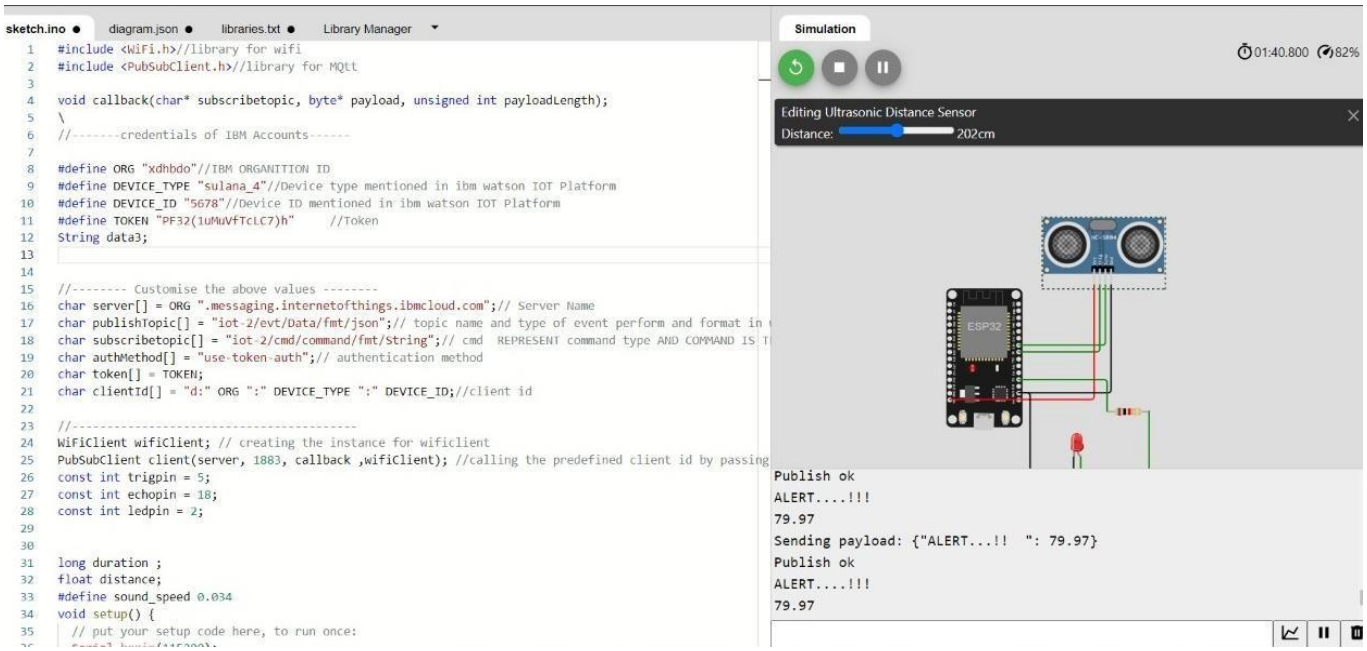


Output in WOWKI

a) when the distance is below 100 cms

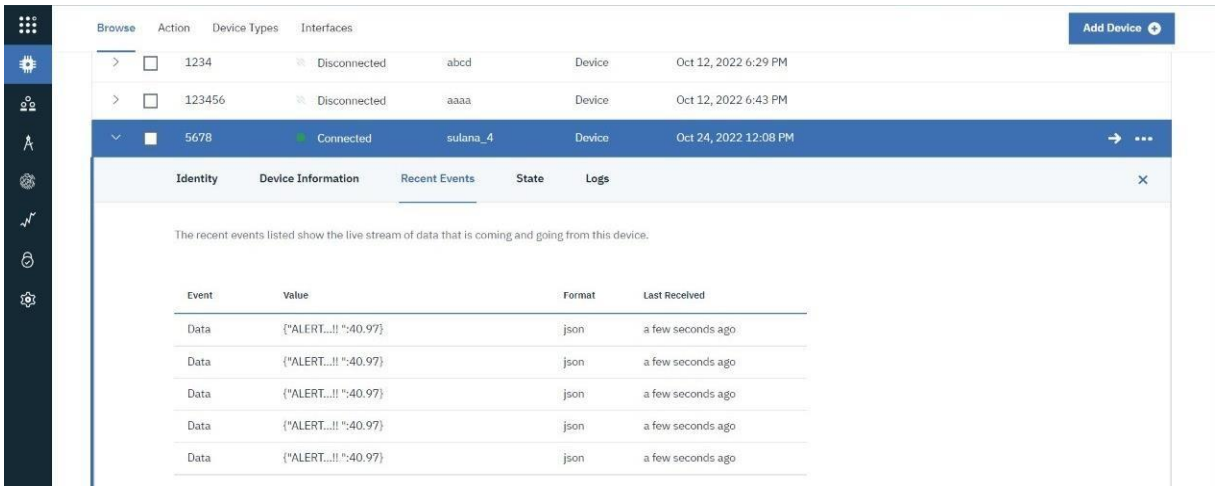


b) when the distance is above 100 cms ,(no alert message is displayed here for 202 cm)



Output in IBM CLOUD (Watson Platform)

Displayed in device recent events



Program 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 "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 andformat in
which data to be send
char subscribetopic[] = "iot-2/cmd/command/fmt/String";// cmd REPRESENT commandtype AND
COMMAND IS TEST OF FORMAT STRING
char authMethod[] = "use-token-auth";// authentication methodchar 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 bypassing
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 cloudString 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 printpublish 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="";
}
```