IBM ASSIGNMENT 3-IOT DOMAIN

Link:

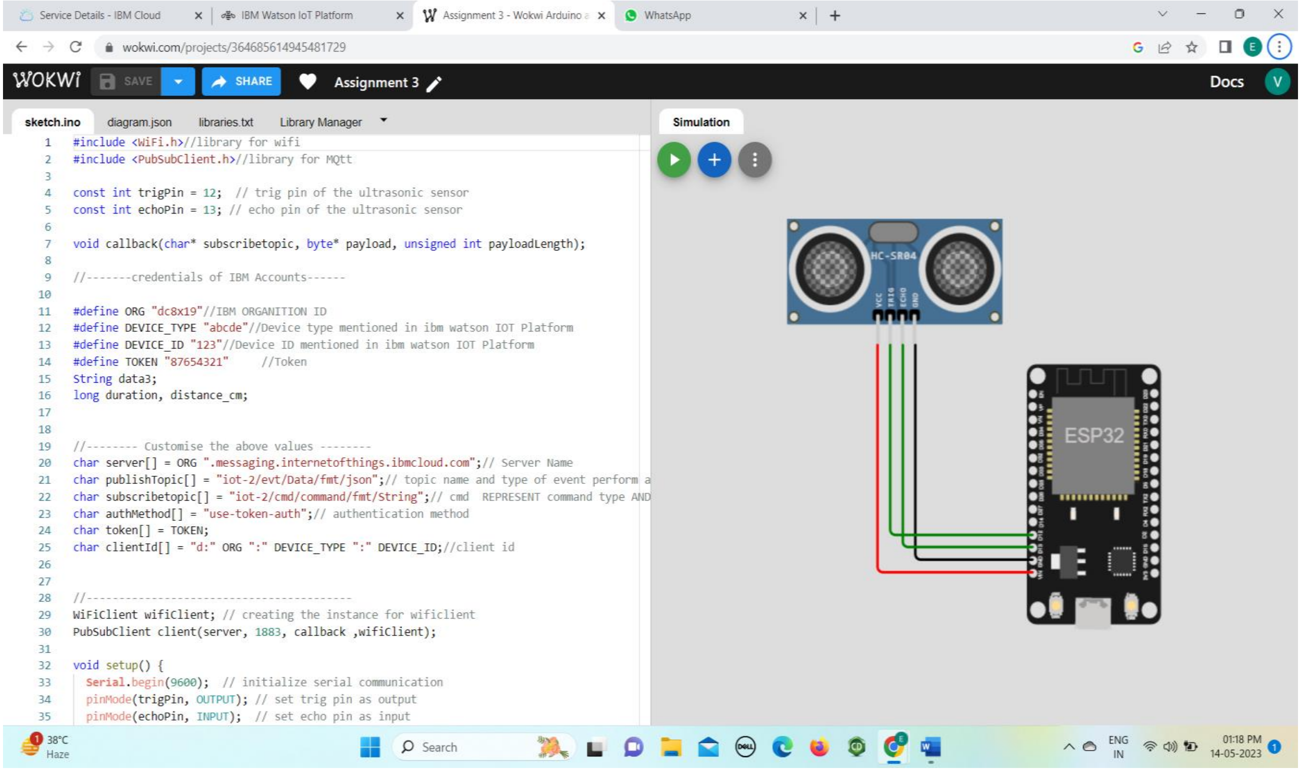
https://wokwi.com/projects/364540012436747265

Code:

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

const int trigPin = 12;  // trig pin of the ultrasonic sensor
const int echoPin = 13; // echo pin of the ultrasonic sensor

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

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

#define ORG "dc8x19"//IBM ORGANITION ID
#define DEVICE_TYPE "abcde"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "123"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "87654321"     //Token
String data3;
long duration, distance_cm;


//-------- 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);

void setup() {
  Serial.begin(9600);  // initialize serial communication
  pinMode(trigPin, OUTPUT); // set trig pin as output
  pinMode(echoPin, INPUT);  // set echo pin as input

  wificonnect();
  mqttconnect();
}

void loop() {

  digitalWrite(trigPin, LOW);  // send a low pulse to trig pin
  delayMicroseconds(2);

  digitalWrite(trigPin, HIGH); // send a high pulse to trig pin for 10
microseconds
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);

  duration = pulseIn(echoPin, HIGH);  // read the duration of the pulse from
echo pin

  distance_cm = duration / 1000;  // calculate distance in cm
  if(distance_cm <=100){
    Serial.print("Distance: ");
    Serial.print(distance_cm);
    Serial.println(" cm");
    PublishData(distance_cm);
    delay(1000);
    if (!client.loop()) {
      mqttconnect();
  }
  }
  else{
    Serial.println("Distance is greater than 100 ,we cannot print and sent to
cloud");
  }
  delay(1000);  // wait for 1 second before taking the next measurement
}


void PublishData(int distance) {
  mqttconnect();//function call for connecting to ibm
  /*
     creating the String in in form JSon to update the data to ibm cloud
  */
  String payload = "{\"distance\":";
  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);
}
```

Connection:



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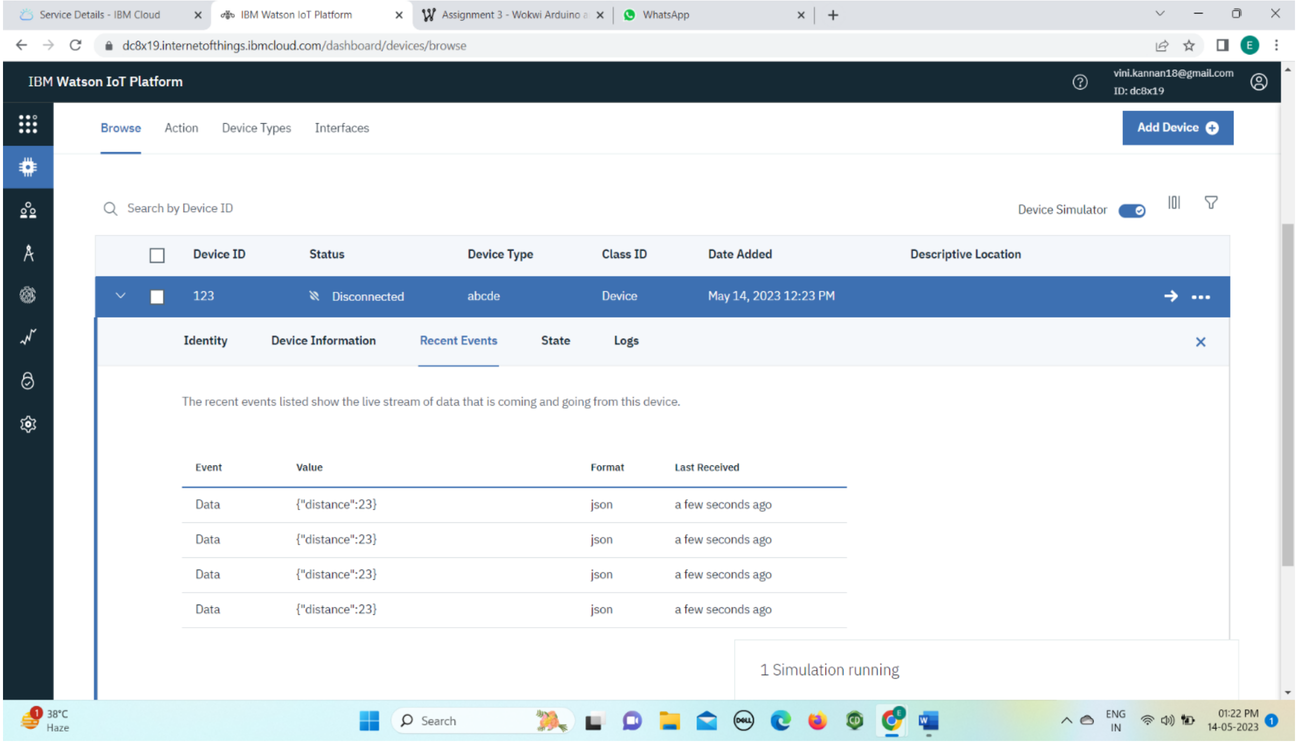
IBM Cloud Recent Events Screenshot:



	Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
□	123	Disconnected	abcde	Device	May 14, 2023 12:23 PM	

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

Event	Value	Format	Last Received
Data	{"distance":23}	json	a few seconds ago
Data	{"distance":23}	json	a few seconds ago
Data	{"distance":23}	json	a few seconds ago
Data	{"distance":23}	json	a few seconds ago