ASSIGNMENT - 4

DATE	21 October 2021
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STUDENT ROLL NUMBER	1918109
MAXIMUM MARKS	2 Marks

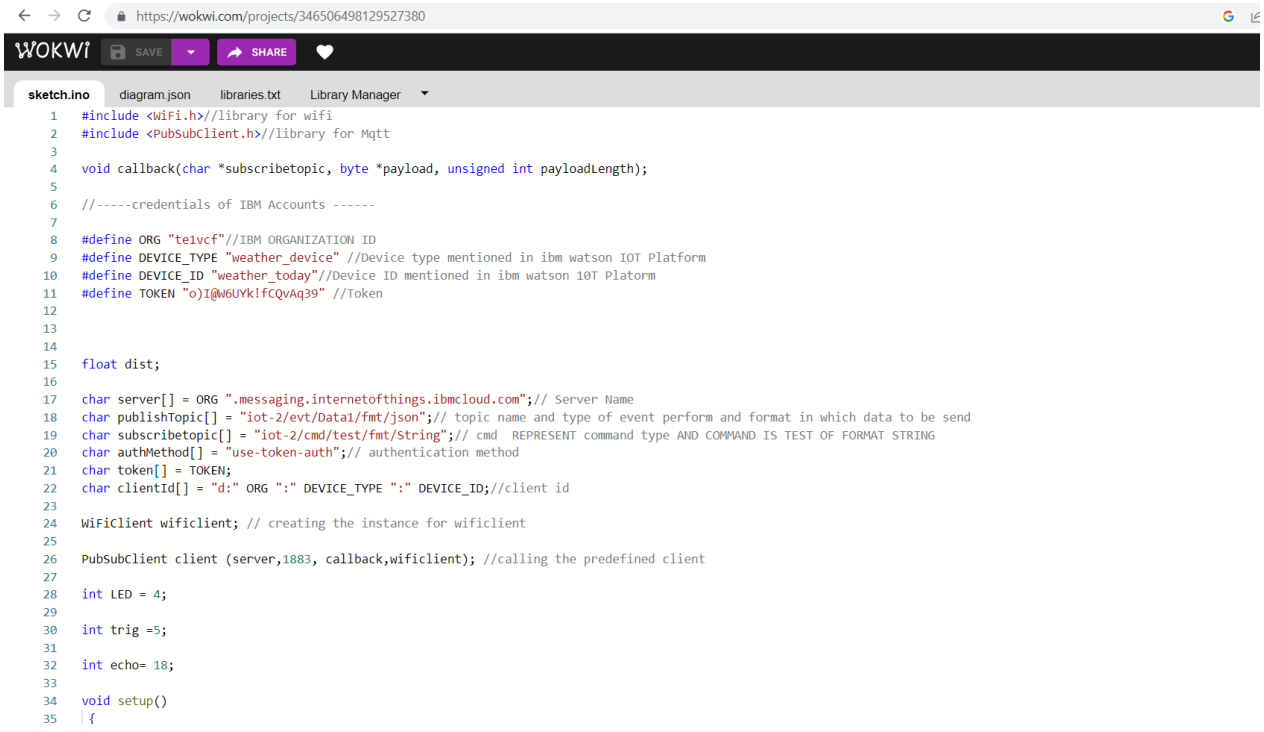
QUESTION :

Write 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.
Upload document with wokwi share link and images of ibm cloud

WOKWI CODE AND IMPLEMENTATION LINK:

https://wokwi.com/projects/346506498129527380

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 "te1vcf"//IBM ORGANIZATION ID
#define DEVICE_TYPE "weather_device" //Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "weather_today"//Device ID mentioned in ibm watson 10T Platorm
#define TOKEN "o)I@W6UYk!fCQvAq39" //Token



float dist;

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name
char publishTopic[] = "iot-2/evt/Data1/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, callback,wificlient); //calling the predefined client

int LED = 4;

int trig =5;

int echo= 18;

void setup()
{
```

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```
void setup()
 {

  Serial.begin(115200);
  pinMode(trig, OUTPUT);
  pinMode(echo, INPUT);
  pinMode(LED, OUTPUT);
  delay(10);

  wificonnect();

  mqttconnect();

 }

 void loop()// Recursive Function

 {
    delayMicroseconds(10);
    digitalWrite(trig, LOW);
    digitalWrite(trig, LOW);
    digitalWrite(trig,HIGH);
    float dur= pulseIn(echo,HIGH);
    float dist = (dur* 0.0343)/2;
    Serial.print ("Distance in cm : ");
    Serial.println(dist);

    PublishData(dist);

    delay(1000);

    if (!client.loop()) {

     mqttconnect();
```

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```
    }
}

void PublishData(float dist) {
  mqttconnect();

  String object;

  if (dist<100)
  {
    digitalWrite(LED, HIGH);
    Serial.println("object is near");
    object = "ALERT! object is near";
  }

  else
  {
    digitalWrite(LED,LOW);
    Serial.println("no object found");
    object ="No object found";
  }

  String payload="{\"distance\":";
  payload += dist;
  payload += "," "\"object\":\"";
  payload += object;
  payload += "\"}";

  Serial.print("Sending payload: ");
  Serial.println(payload);

  if (client.publish(publishTopic, (char*) payload.c_str()))
  {
    Serial.println("Publish ok"); // if it sucessfully upload
```

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```
  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());
}
```

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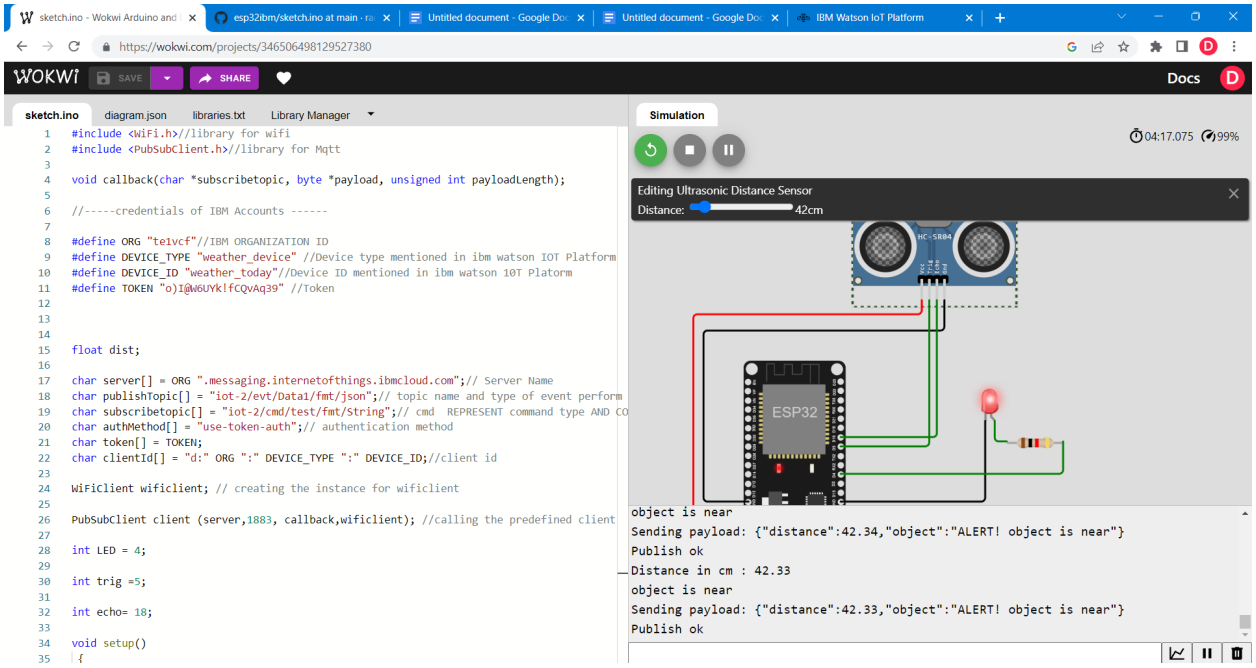
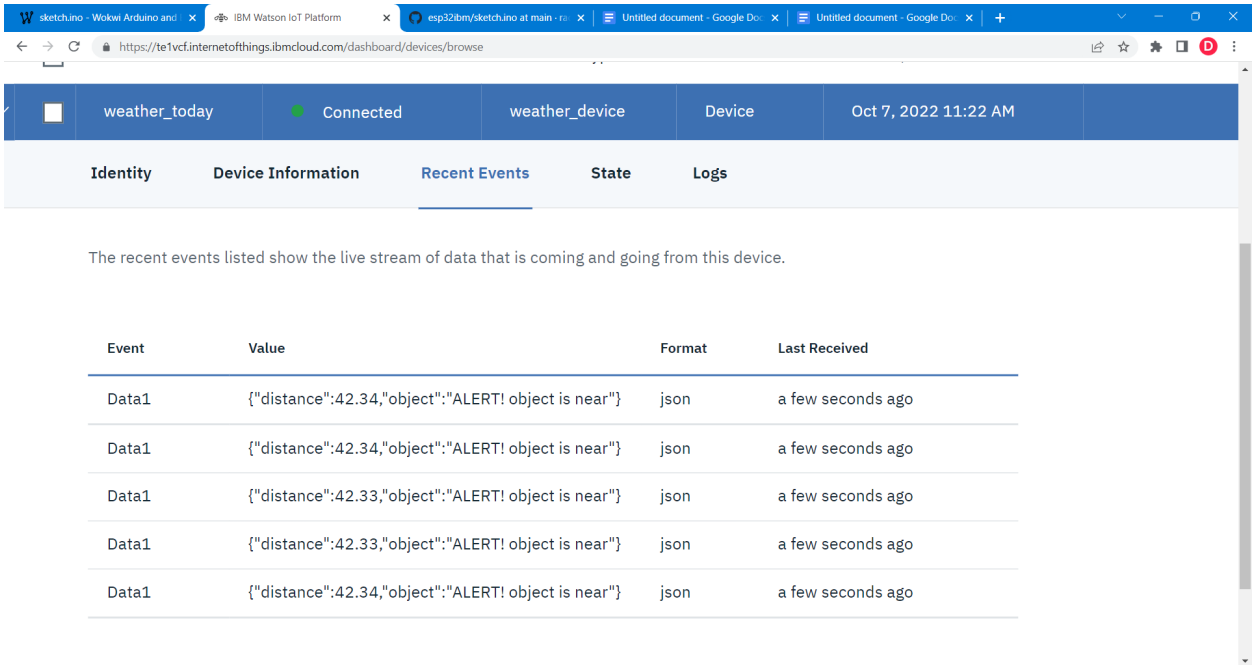
```

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);
  digitalWrite(LED,HIGH);

  }

  //else
  {
//Serial.println(data3);
digitalWrite(LED,LOW);

  }
```

OUTPUT:

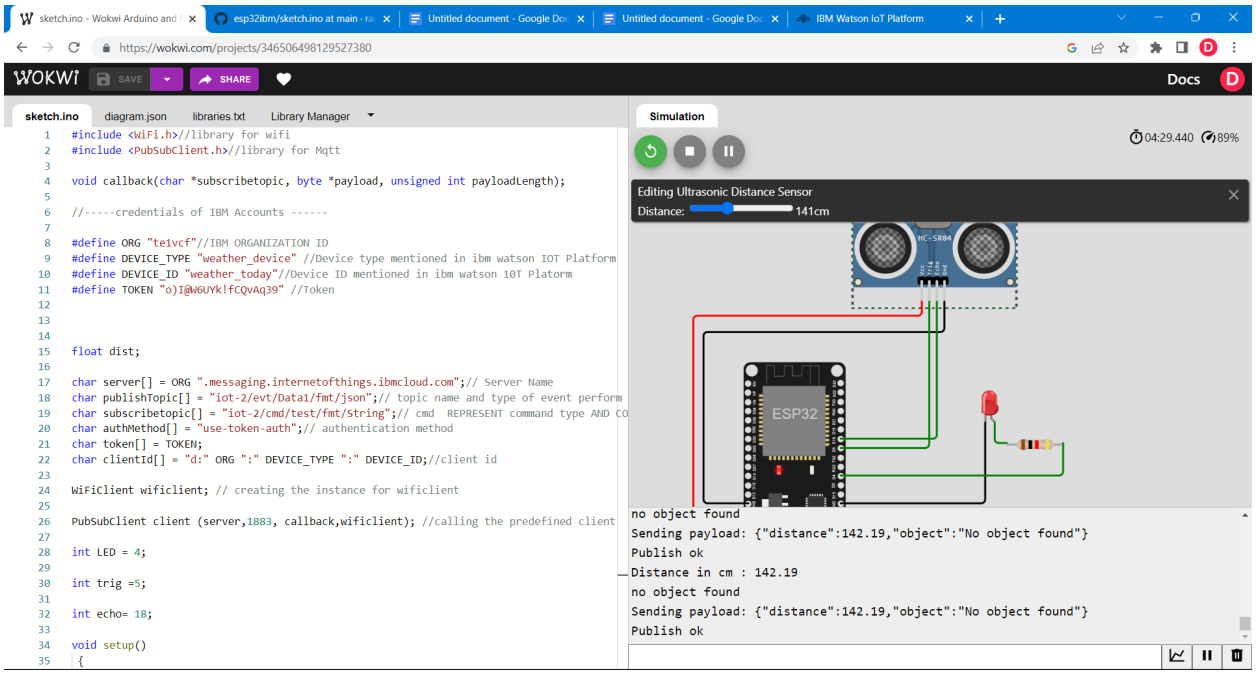
When the distance is less than 100 cms, send an “alert” message to IBM Watson IoT Platform.



IBM CLOUD IMAGE



When the object is far(greater than 100 cms) , send “ no object found” to the IBM Watson IOT Platform.



IBM CLOUD IMAGE