Assignment -4

Assignment Date	20 October 2022
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Student Roll Number	912219106301
Maximum Marks	2 Marks

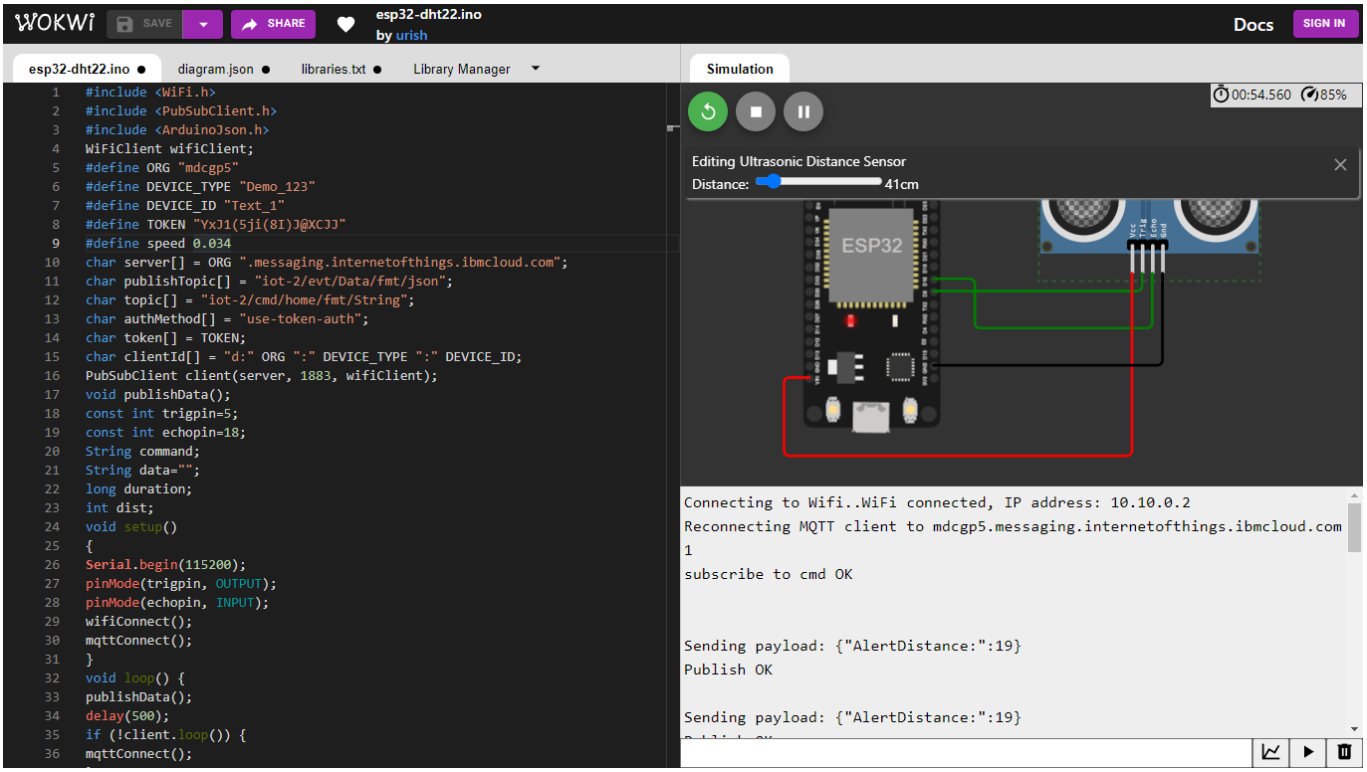
Question-1:

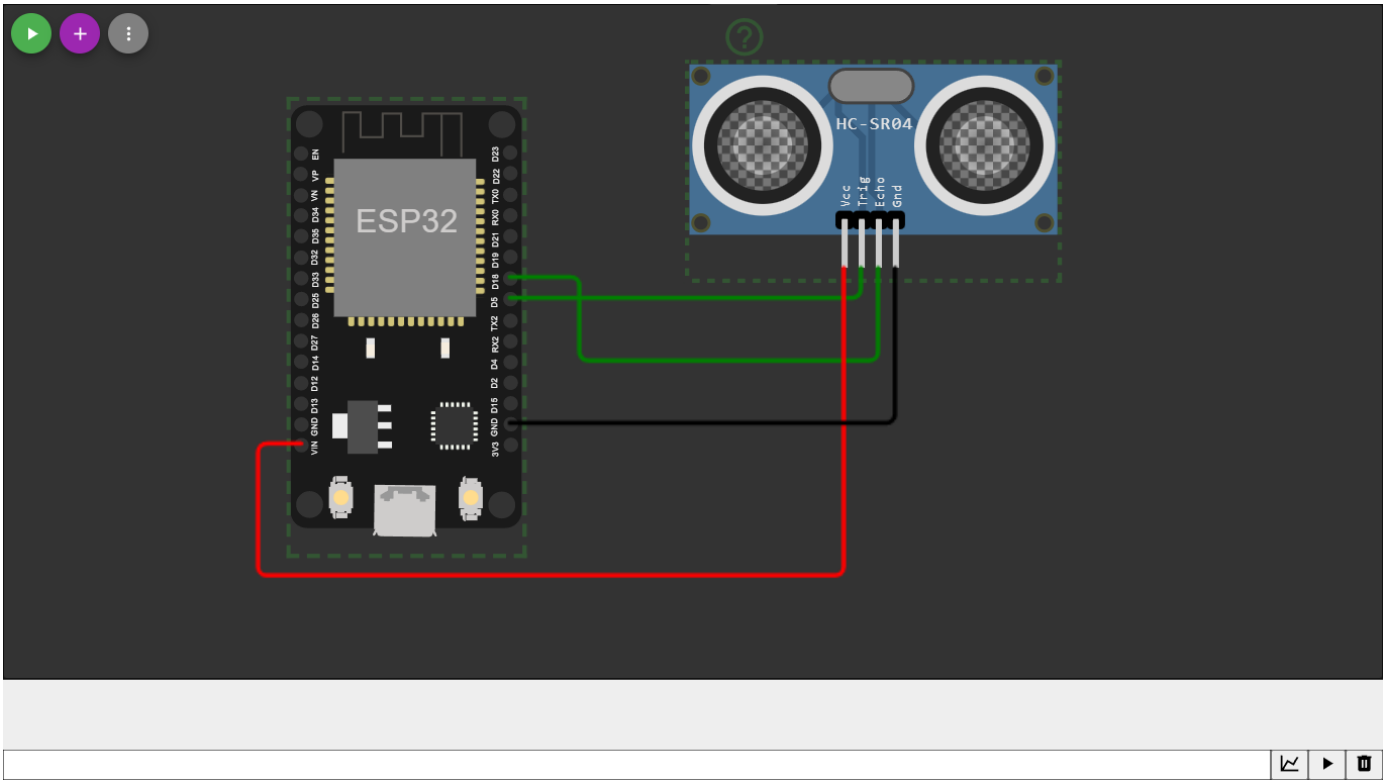
Write code and connections in wokwi for the ultrasonic sensor.
Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events.
Upload document with wokwi share link and images of IBM cloud

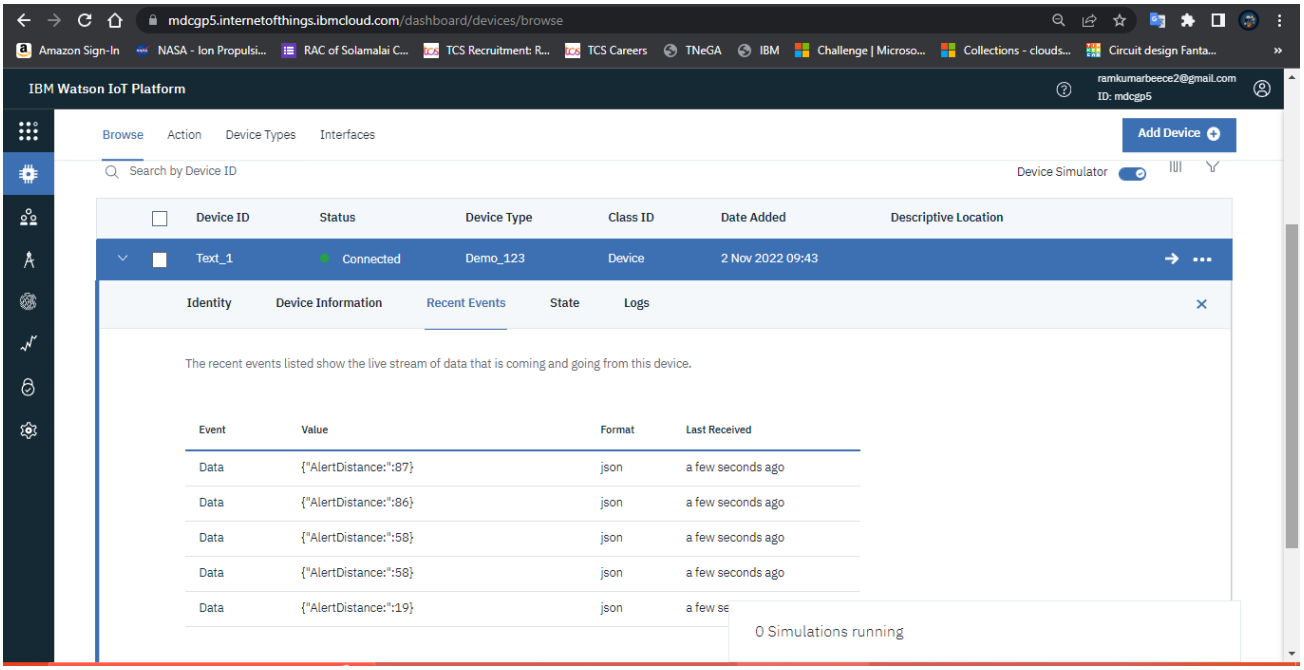
Solution :

```
#include <WiFi.h>
#include <PubSubClient.h>
#include <ArduinoJson.h>

WiFiClient wifiClient;

#define ORG "mdcgp5"
#define DEVICE_TYPE "Demo_123"
#define DEVICE_ID "Text_1"
#define TOKEN "YxJ1(5ji(8I)J@XCJJ"
#define speed 0.034

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Data/fmt/json";
char topic[] = "iot-2/cmd/home/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);
void publishData();

const int trigpin=5;
const int echopin=18;
String command;
String data="";

long duration;
int dist;

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

void loop() {

  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(1000);
    }
    initManagedDevice();
    Serial.println();
  }
}

void initManagedDevice() {
  if (client.subscribe(topic)) {
    Serial.println(client.subscribe(topic));
    Serial.println("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){
    DynamicJsonDocument doc(1024);
    String payload;
    doc["AlertDistance:"]=dist;
    serializeJson(doc, payload);
    delay(3000);
    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");
    }
  }
}
```


WOKWi
SAVE
SHARE
esp32-dht22.ino
by urish
Docs
SIGN IN
esp32-dht22.ino
diagram.json
libraries.txt
Library Manager
Simulation
00:54.560
85%
Editing Ultrasonic Distance Sensor
Distance:
41cm
ESP32
Vcc
Trig
Echo
Gnd
Connecting to Wifi..WiFi connected, IP address: 10.10.0.2
Reconnecting MQTT client to mdcgp5.messaging.internetofthings.ibmcloud.com
1
subscribe to cmd OK
Sending payload: {"AlertDistance":19}
Publish OK
Sending payload: {"AlertDistance":19}


ESP32
HC-SR04
Vcc
Trig
Echo
Gnd


mdcgp5.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
ramkumarbeece2@gmail.com
ID: mdcgp5
Browse
Action
Device Types
Interfaces
Add Device
Search by Device ID
Device Simulator
Device ID
Status
Device Type
Class ID
Date Added
Descriptive Location
Text_1
Connected
Demo_123
Device
2 Nov 2022 09:43
Identity
Device Information
Recent Events
State
Logs
The recent events listed show the live stream of data that is coming and going from this device.
Event
Value
Format
Last Received
Data
{"AlertDistance":87}
json
a few seconds ago
Data
{"AlertDistance":86}
json
a few seconds ago
Data
{"AlertDistance":58}
json
a few seconds ago
Data
{"AlertDistance":58}
json
a few seconds ago
Data
{"AlertDistance":19}
json
0 Simulations running