Assignment -4

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

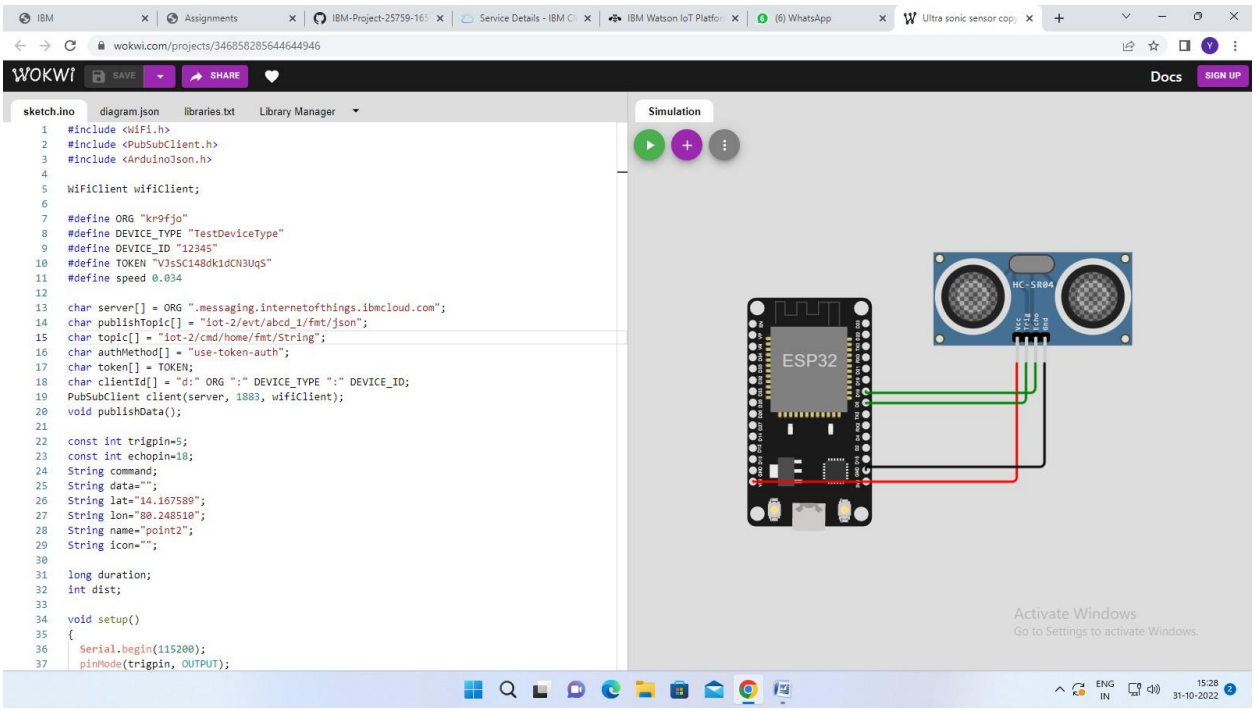
Program:

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

WiFiClient wifiClient;

#define ORG "kr9fjo"
#define DEVICE_TYPE "TestDeviceType" #define
DEVICE_ID "12345"
#define TOKEN "VJsSC148dk1dCN3UqS"
#define speed 0.034

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/abcd_1/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="";
String lat="14.167589";
String lon="80.248510";
String name="point2";
String icon="";

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){
dist=100-dist;
icon="fa-trash";
}else{     dist=0;
   icon="fa-trash-o";
 }
 DynamicJsonDocument doc(1024);
 String payload;
doc["Name"]=name;
doc["Latitude"]=lat;
doc["Longitude"]=lon;
doc["Icon"]=icon;
doc["FillPercent"]=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");
 } }
```

Output:


wokwi.com/projects/346858285644644946
WOKWI
SAVE
SHARE
Docs
SIGN UP
sketch.ino
diagram.json
libraries.txt
Library Manager
Simulation
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#include <PubSubClient.h>
#include <ArduinoJson.h>
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long duration;
int dist;
void setup()
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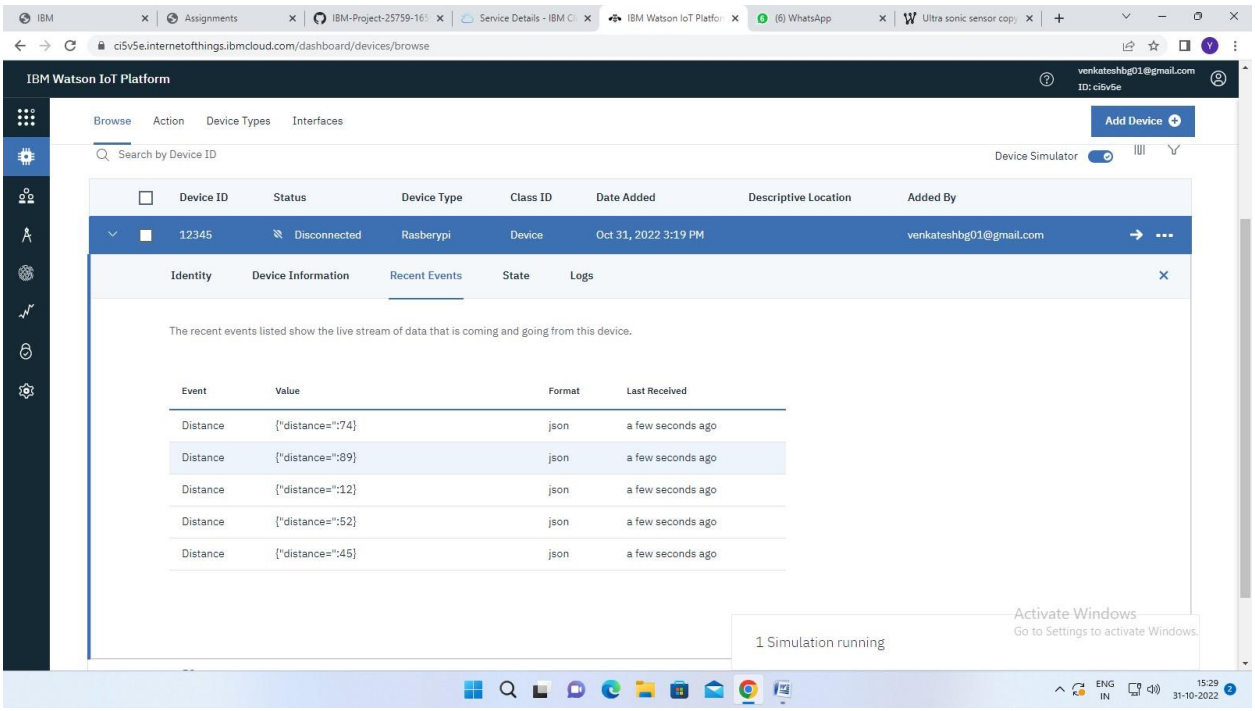
pinMode(trigpin, OUTPUT);
ESP32
HC-SR04
Activate Windows
Go to Settings to activate Windows.
ENG
IN
15:28
31-10-2022


ci5v5e.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
venkateshbg01@gmail.com
ID: ci5v5e
Browse
Action
Device Types
Interfaces
Add Device
Search by Device ID
Device Simulator
Device ID
Status
Device Type
Class ID
Date Added
Descriptive Location
Added By
12345
Disconnected
Rasberypi
Device
Oct 31, 2022 3:19 PM
venkateshbg01@gmail.com
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
Distance
{"distance":74}
json
a few seconds ago
Distance
{"distance":89}
json
a few seconds ago
Distance
{"distance":12}
json
a few seconds ago
Distance
{"distance":52}
json
a few seconds ago
Distance
{"distance":45}
json
a few seconds ago
1 Simulation running
Activate Windows
Go to Settings to activate Windows.
ENG
IN
15:29
31-10-2022