Assignment -4

Assignment Date	7 NOV 2022
Student Name	S.Monika.ss
Team ID	PNT2022TMID37031
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

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() {
```

```cpp
  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");
  }
}
```
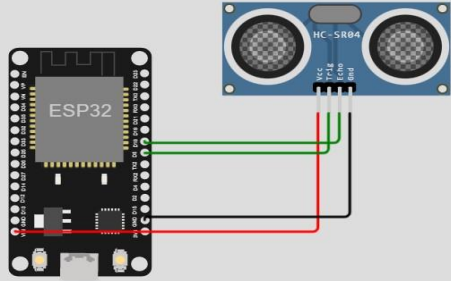
Output:0

Screenshot 1 - Wokwi editor:

```
1    #include <WiFi.h>
2    #include <PubSubClient.h>
3    #include <ArduinoJson.h>
4
5    WiFiClient wifiClient;
6
7    #define ORG "kr9fjo"
8    #define DEVICE_TYPE "TestDeviceType"
9    #define DEVICE_ID "12345"
10   #define TOKEN "VJsSC148dk1dCN3UqS"
11   #define speed 0.034
12
13   char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
14   char publishTopic[] = "iot-2/evt/abcd_1/fmt/json";
15   char topic[] = "iot-2/cmd/home/fmt/String";
16   char authMethod[] = "use-token-auth";
17   char token[] = TOKEN;
18   char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
19   PubSubClient client(server, 1883, wifiClient);
20   void publishData();
21
22   const int trigpin=5;
23   const int echopin=18;
24   String command;
25   String data="";
26   String lat="14.167589";
27   String lon="80.248510";
28   String name="point2";
29   String icon="";
30
31   long duration;
32   int dist;
33
34   void setup()
35   {
36     Serial.begin(115200);
37     pinMode(trigpin, OUTPUT);
```

Screenshot 2 - IBM Watson IoT Platform Recent Events:

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

Device ID: 12345 — Disconnected — Device Type: Rasberypi — Class ID: Device — Date Added: Oct 31, 2022 3:19 PM — Added By: venkateshbg01@gmail.com

1 Simulation running