Assignment-4

Assignment Date	27 OCTOBER 2022
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Maximum Marks	2 Marks

Question-1:

Write code and connections in wowki for ultrasonic sensor.

Whenever distance is less than 100 cms send "alert" to IBM cloud and display in device recent events.

Solution:

WOWKI LINK: https://wokwi.com/projects/346235465961046612

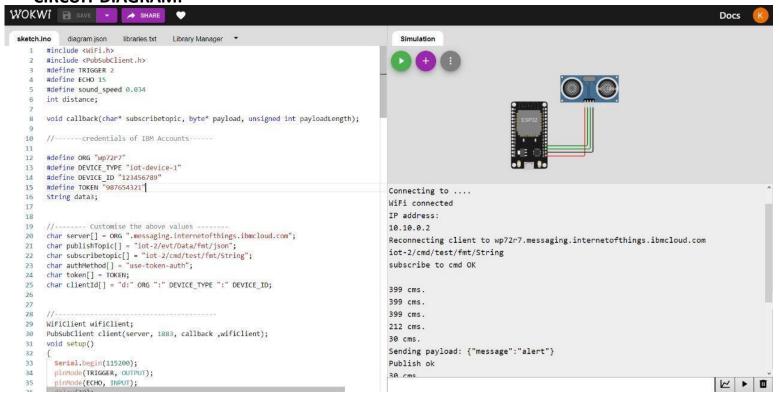
```
#include <WiFi.h>
#include < PubSubClient.h >
#define TRIGGER 2
#define ECHO 15
#define sound_speed 0.034
int distance;
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
//----credentials of IBM Accounts-----
#define ORG "wp72r7"
#define DEVICE_TYPE "iot-device-1"
#define DEVICE ID "123456789"
#define TOKEN "987654321"
String data3;
//----- Customise the above values ------
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Data/fmt/json";
char subscribetopic[] = "iot-2/cmd/test/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
```

```
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
//-----
WiFiClient wifiClient;
PubSubClient client(server, 1883, callback, wifiClient);
void setup()
 Serial.begin(115200);
 pinMode(TRIGGER, OUTPUT);
 pinMode(ECHO, INPUT);
 delay(10);
 Serial.println();
 wificonnect();
 mqttconnect();
}
void loop()
{
 digitalWrite(TRIGGER, HIGH);
 delayMicroseconds(10);
 digitalWrite(TRIGGER, LOW);
 int duration=pulseIn(ECHO,HIGH);
 distance=(duration*sound_speed)/2;
 Serial.print("Distance:");
 Serial.print(distance);
 Serial.println("cms");
 if(distance<100){
 PublishData(distance);
 }
 delay(1000);
 if (!client.loop()) {
  mqttconnect();
 }
}
```

```
/....../
void PublishData(int d) {
 mqttconnect();
 String payload = "{\"message\":alert}";
 Serial.print("Sending payload: ");
 Serial.println(payload);
 if (client.publish(publishTopic, (char*) payload.c str())) {
  Serial.println("Publish ok");
 } 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()
{
 Serial.println();
 Serial.print("Connecting to ");
 WiFi.begin("Wokwi-GUEST", "", 6);
 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++) {
  data3 += (char)payload[i];
 }
 Serial.println("data: "+ data3);
data3="";
}
```

CIRCUIT DIAGRAM:



IBM CLOUD RECENT EVENTS:

