Assignment -4

Assignment Date	20 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
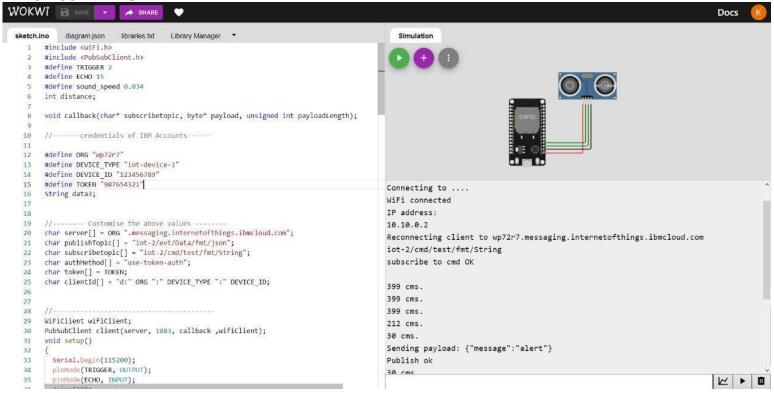
```
#include  <WiFi.h>
#include <PubSubClient.h>
#define TRIGGER 2
#define ECHO 15
#define sound_speed 0.034
int distance;

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(distan
  ce);
  }
  delay(1000);
  if (!client.loop())
   {mqttconnect();
  }
}
```

```
/..............................retrieving to Cloud……………………………. /

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: