Assignment -4

Python Programming

Assignment Date	21 October2022
Student Name	Ajin R
Student Roll Number	962319104009
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 it in the device's recent events.

Solution link : wokwi

Solution code:

```
#include <WiFi.h>

#include <PubSubClient.h>



#define ORG "fvs923"

#define DEVICE_TYPE "zenabc"

#define DEVICE_ID "221"

#define TOKEN "12345678"

#define trigpin 5

#define echopin 18



char server[] = ORG ".messaging.internetofthings.ibmcloud.com";

char publishTopic[] = "iot-2/evt/data/fmt/json";

char authMethod[] = "use-token-auth";

char token[] = TOKEN;

char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
```

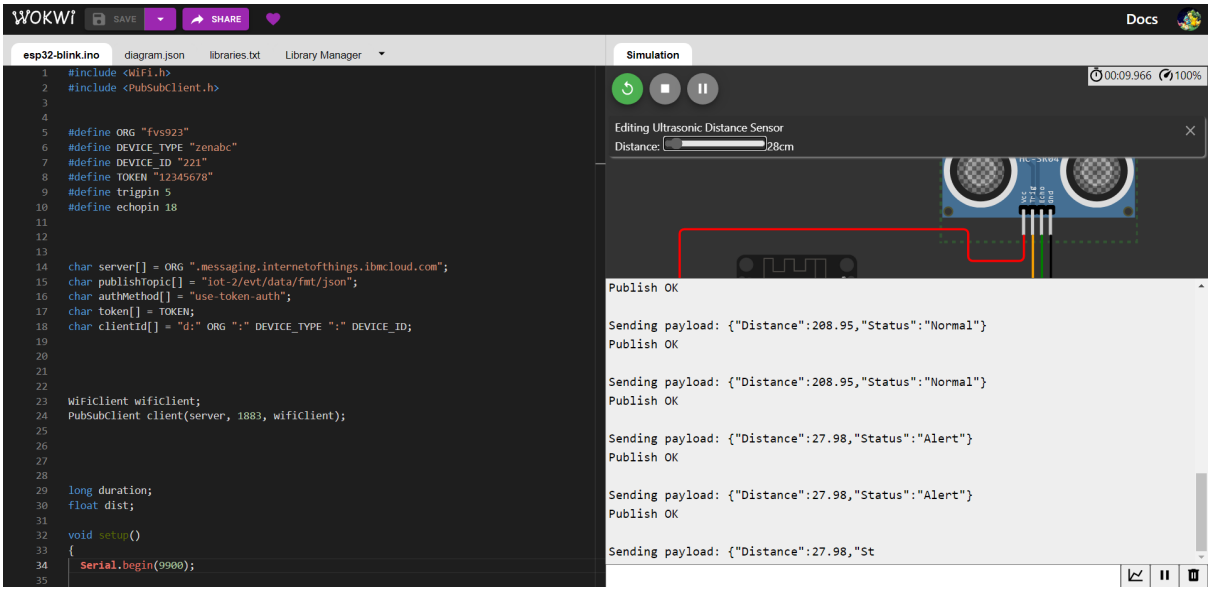
```
WiFiClient wifiClient;
PubSubClient client(server, 1883, wifiClient);




long duration;
float dist;

void setup()
{
  Serial.begin(10000);

  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(500);
    }
```

```
   Serial.println();
  }
}



void publishData()
{
  digitalWrite(trigpin,LOW);
  digitalWrite(trigpin,HIGH);
  delayMicroseconds(10);
  digitalWrite(trigpin,LOW);
  duration=pulseIn(echopin,HIGH);
  dist=duration*0.034 /2;
  if(dist<100)
  {

    String payload = "{\"Distance\":";
    payload += dist;
    payload += ",";
    payload += "\"Status\":";
    payload += "\"Alert\"}";

    Serial.print("\n");
    Serial.print("Sending payload: ");
    Serial.println(payload);
    if (client.publish(publishTopic, (char*) payload.c_str()))
    {
      Serial.println("Publish OK");
    }
```

```
}
 if(dist>100)
  {

    String payload = "{\"Distance\":";
    payload += dist;
    payload += ",";
    payload += "\"Status\":";
    payload += "\"Normal\"}";

 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:



The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
data	{"Distance":27.98,"Status":"Alert"}	json	a few seconds ago
data	{"Distance":27.98,"Status":"Alert"}	json	a few seconds ago
data	{"Distance":27.98,"Status":"Alert"}	json	a few seconds ago
data	{"Distance":27.98,"Status":"Alert"}	json	a few seconds ago
data	{"Distance":27.98,"Status":"Alert"}	json	a few seconds ago

Link : https://wokwi.com/projects/346594780829975124