Assignment 4

Assignment Date	19 October 2022
Student Name	PRAGADISH SELVAN R
Student Roll Number	737819ECR127
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.

Solution:

```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt
const int trigPin = 19;
const int echoPin = 18;

//-------credentials of IBM Accounts------

#define ORG "yOptv0"//IBM ORGANITION ID
#define DEVICE_TYPE "abcd"//Device type mentioned in ibm watson IOT
Platform #define DEVICE_ID "2314"//Device ID mentioned in ibm watson IOT
Platform #define TOKEN "12345678" //Token

#define SOUND_SPEED 0.034

long duration;
float dist;


//-------- Customise the above values --------
char server[] = ORG
".messaging.internetofthings.ibmcloud.com"; char
publishTopic[] = "iot-2/evt/Data/fmt/json";
char subscribetopic[] = "iot-2/cmd/command/fmt/String";
char authMethod[] = "use-token-auth";// authentication
method char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id


//—-
WiFiClient wifiClient; // creating the instance for wificlient
PubSubClient client(server, 1883, wifiClient); //calling the
predefined client id by passing parameter like server id,portand
wificredential
void setup()// configureing the ESP32
```

```
{
  Serial.begin(115200);
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  delay(10);
  Serial.println();
  wificonnect();
  mqttconnect();
}

void loop()// Recursive Function
{

  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);
  duration = pulseIn(echoPin, HIGH);
  dist = duration * SOUND_SPEED/2;

  // Prints the distance in the Serial Monitor
  Serial.print("Distance: ");
  Serial.print(dist);
  Serial.println(" cm");
  delay(1000);

  PublishData(dist);
  delay(1000);
  if (!client.loop()) {
    mqttconnect();
  }
}
/*.....................................retrieving
to Cloud. ............................. */

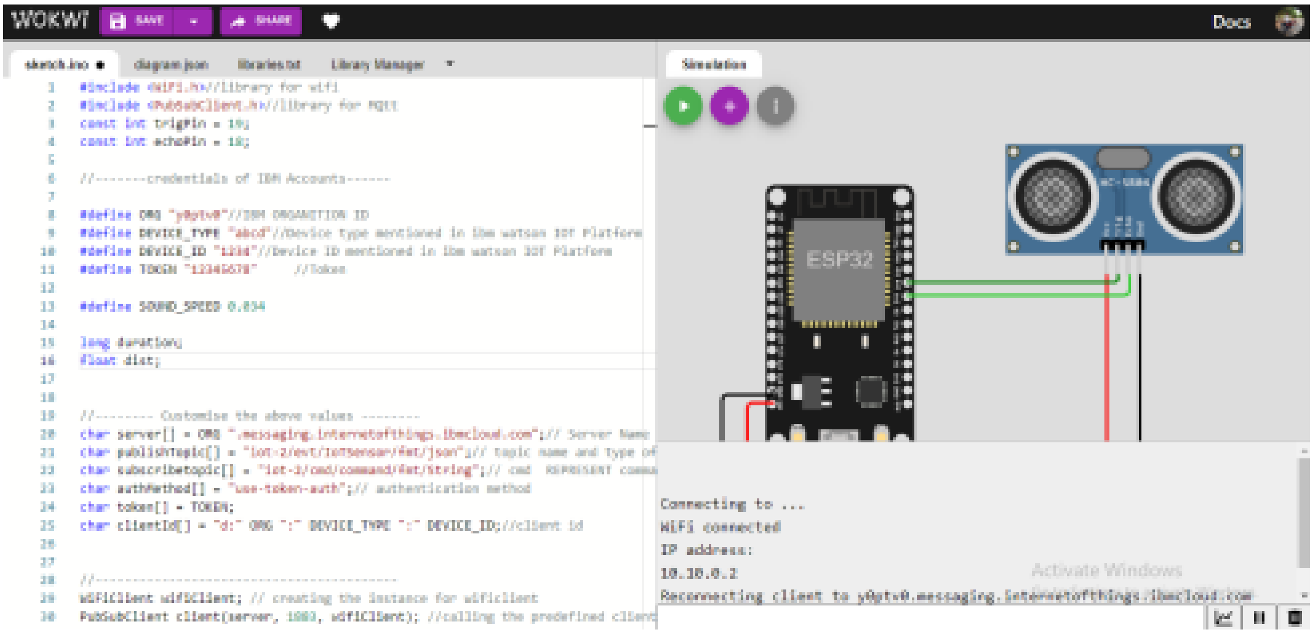
void PublishData(float dist) {
  mqttconnect();//function call for connecting to ibm
  /*
     creating the String in form JSon to update the data to ibm
  cloud */
  if(dist<100)
  {
  String payload = "{\"Alert! Distance is less than
  100\":"; payload += dist;
  payload += "}";
  Serial.print("Sending payload: ");
  Serial.println(payload);
  if (client.publish(publishTopic, (char*) payload.c_str()))
    { Serial.println("Publish ok");
  }
else {
    Serial.println("Publish failed");
  }
   }
   else{
     String payload = "{\"Distance\":";
     payload += dist;
     payload += "}";
     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);
    }
     Serial.println();
  }
}
void wificonnect() //function defination for
wificonnect {
  Serial.println();
  Serial.print("Connecting to ");

  WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials
to establish the connection
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }
  Serial.println("");
  Serial.println("WiFi connected");
  Serial.println("IP address: ");
  Serial.println(WiFi.localIP());
}
```

OUTPUT IN WOKWI:



```
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#include <PubSubClient.h>//library for MQtt
const int trigPin = 19;
const int echoPin = 18;

//-------credentials of IBM Accounts------

#define ORG "y0ptv0"//IBM ORGANITION ID
#define DEVICE_TYPE "abcd"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "1234"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "12345678"     //Token

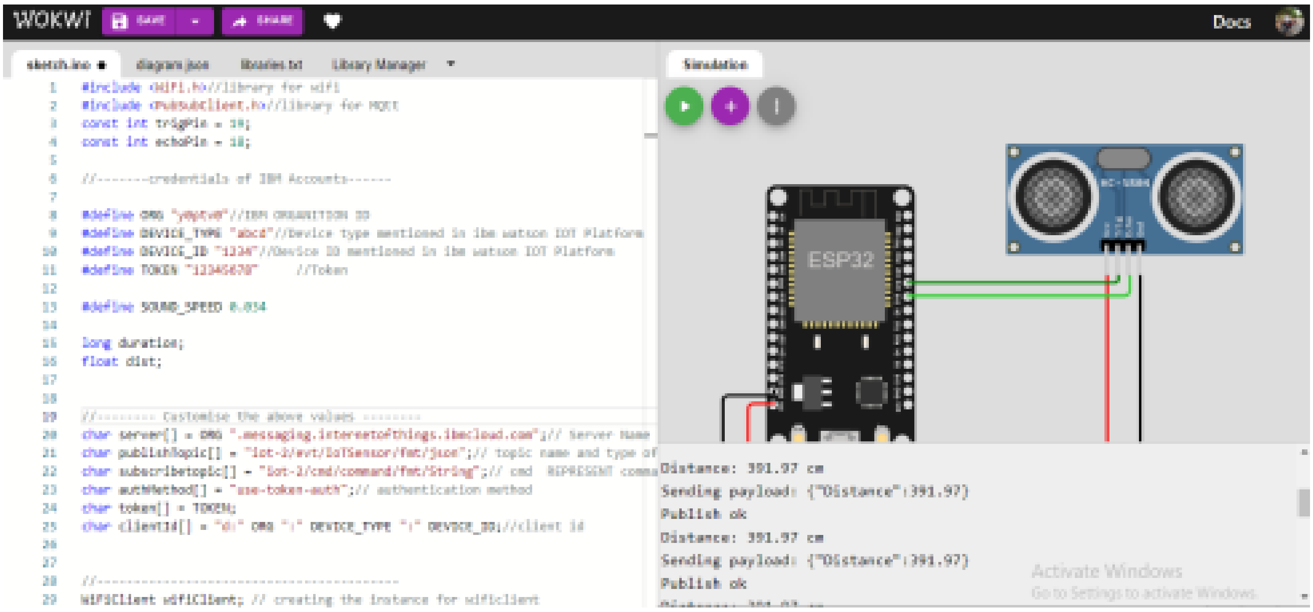
#define SOUND_SPEED 0.034

long duration;
float dist;


//-------- Customise the above values --------
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name
char publishTopic[] = "iot-2/evt/IoTSensor/fmt/json";// topic name and type of
char subscribetopic[] = "iot-2/cmd/command/fmt/String";// cmd  REPRESENT comma
char authMethod[] = "use-token-auth";// authentication method
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id


//-----------------------------------------
WiFiClient wifiClient; // creating the instance for wificlient
PubSubClient client(server, 1883, wifiClient); //calling the predefined client
```

```
Connecting to ...
WiFi connected
IP address:
10.10.0.2
Reconnecting client to y0ptv0.messaging.internetofthings.ibmcloud.com
```



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char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id


//-----------------------------------------
WiFiClient wifiClient; // creating the instance for wificlient
```

```
Distance: 391.97 cm
Sending payload: {"Distance":391.97}
Publish ok
Distance: 391.97 cm
Sending payload: {"Distance":391.97}
Publish ok
Distance: 391.97 cm
```

Wokwi link: https://wokwi.com/projects/348296053459518036