## Assignment -4

## ESP32 Programming with IBM Cloud

Assignment Date	29 October 2022
Student Name	Akash.K
Student Roll Number	820419106005
Maximum Marks	2 Marks

## Question-1:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100cms send "alert" to ibm cloud and display in device recent events.

Upload document with wokwi share link and images of ibm cloud.

```
Solution:
```

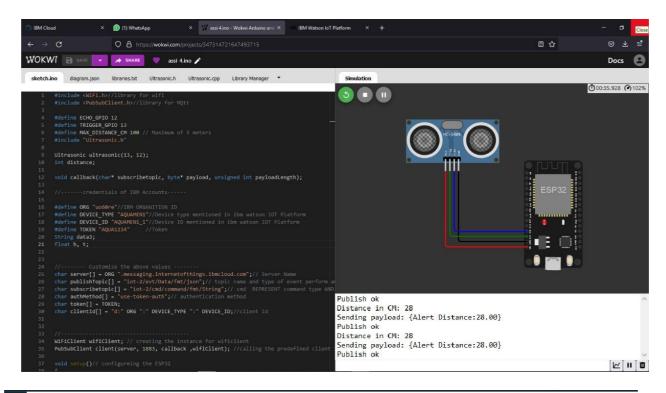
```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt
#define ECHO_GPIO 12
#define TRIGGER GPIO 13
#define MAX_DISTANCE_CM 100 // Maximum of 5 meters
#include "Ultrasonic.h"
Ultrasonic ultrasonic(13, 12);
int distance;
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
//----credentials of IBM Accounts-----
#define ORG "uo60re"//IBM ORGANITION ID
#define DEVICE_TYPE "AQUAMEN1"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "AQUAMEN1_1"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "AQUA1234" //Token
String data3;
float h, t;
//---- Customise the above values ------
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name
char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of event
perform and format in which data to be send
char subscribetopic[] = "iot-2/cmd/command/fmt/String";// cmd REPRESENT command
type AND COMMAND IS TEST OF FORMAT 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
```

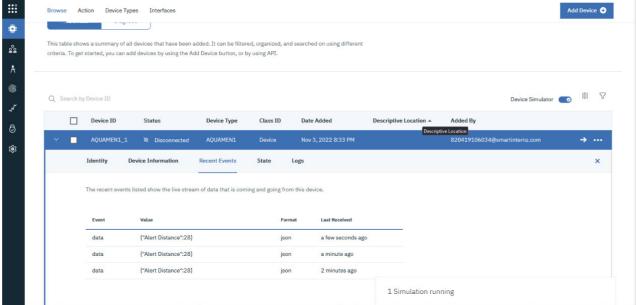
```
PubSubClient client(server, 1883, callback ,wifiClient); //calling the predefined
client id by passing parameter like server id, portand wificredential
void setup()// configureing the ESP32
 Serial.begin(115200);
 delay(10);
 Serial.println();
 wificonnect();
 mqttconnect();
}
void loop()// Recursive Function
 distance = ultrasonic.read(CM);
  if(distance < 100){</pre>
 Serial.print("Distance in CM: ");
 Serial.println(distance);
 PublishData(distance);
 delay(1000);
 if (!client.loop()) {
   mqttconnect();
 }
  }
  delay(1000);
}
/*.....retrieving to
Cloud.....*/
void PublishData(float temp) {
  mqttconnect();//function call for connecting to ibm
  /*
    creating the String in in form JSon to update the data to ibm cloud
  */
 String payload = "{\"Alert Distance:\":";
  payload += temp;
  payload += "}";
 Serial.print("Sending payload: ");
 Serial.println(payload);
  if (client.publish(publishTopic, (char*) payload.c_str())) {
   Serial.println("Publish ok");// if it sucessfully upload data on the cloud
then it will print publish ok in Serial monitor or else it will print publish
```

failed

```
} 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() //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());
}
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++) {</pre>
    //Serial.print((char)payload[i]);
    data3 += (char)payload[i];
```

```
}
Serial.println("data: "+ data3);
if(data3=="lighton")
{
Serial.println(data3);
}
else
{
Serial.println(data3);
}
data3="";
}
```





## Wokwi share link:

https://wokwi.com/projects/347322997381530195