

#### Assignment -4

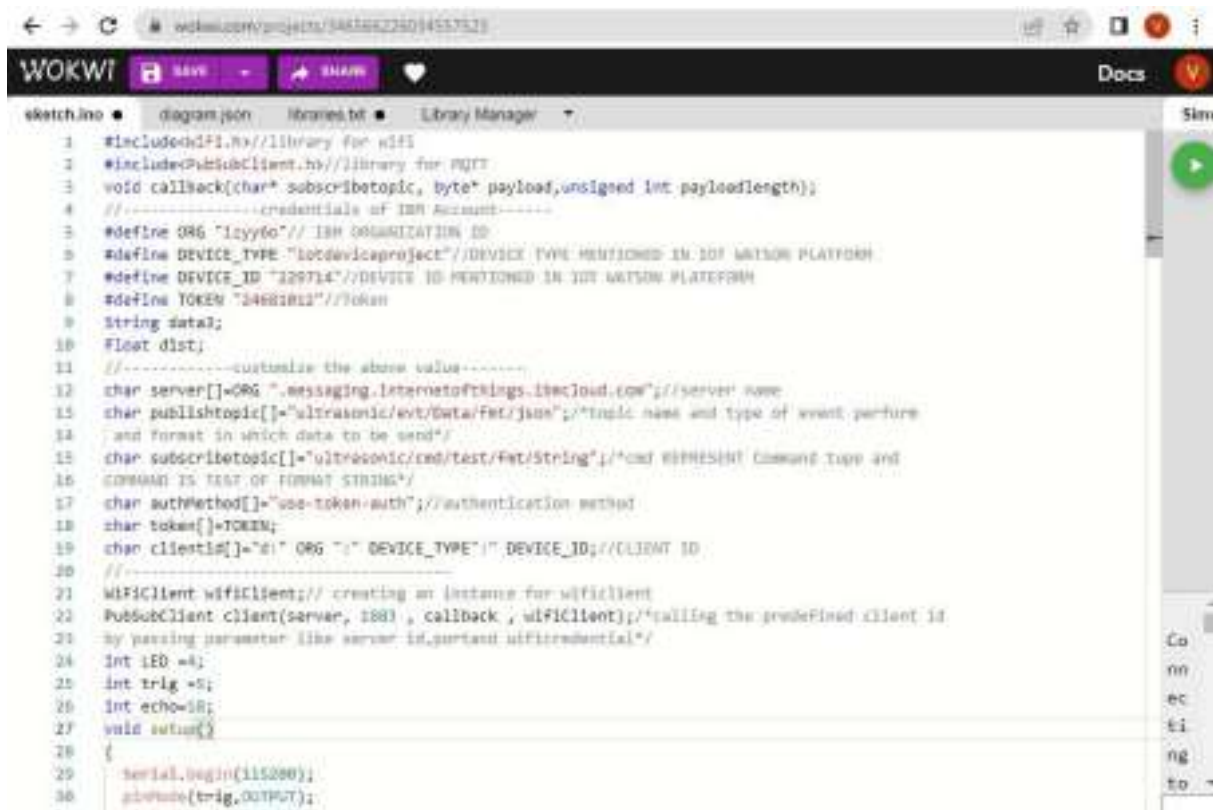
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|---------------------|-----------------|
| Assignment Date     | 25 October 2022 |
| Student Name        | Arunkumar.R     |
| Student Roll Number | 812419106008    |
| Maximum Marks       | 2 Marks         |

#### Question-1:

Write code and connections in wokwi for ultrasonic sensor.

Whenever distance is less than 100 cms send "alert" to ibm cloud and display in device recent events. Upload document with wokwi share link and images of ibm cloud

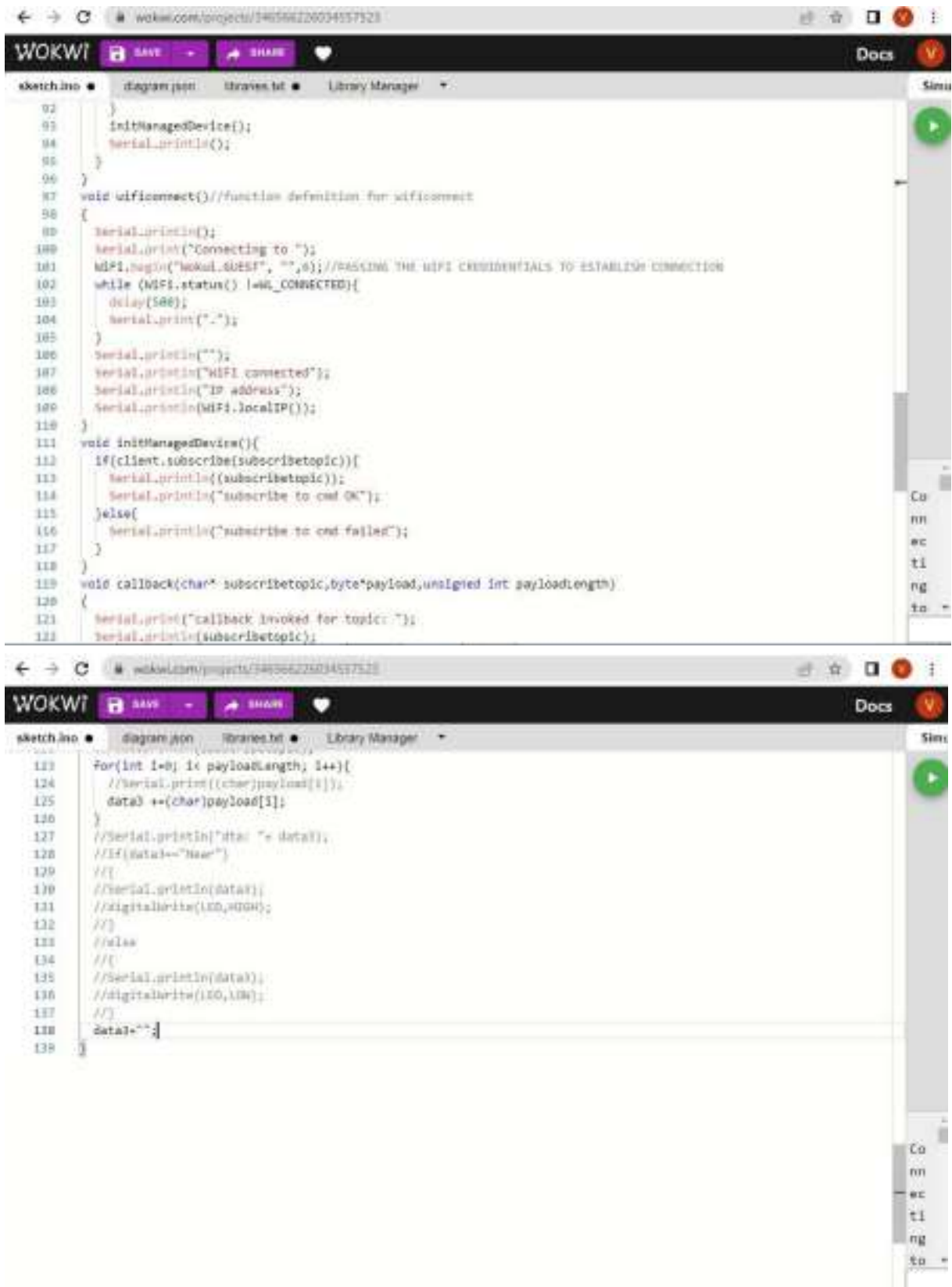
#### Solution:



```
1 #include<WiFi.h> //library for wifi
2 #include<PubSubClient.h> //library for MQTT
3 void callback(char* topic, byte* payload, unsigned int payloadlength);
4 //-----credentials of IBM Account-----
5 #define ORG "1zyy6o" // IBM ORGANIZATION ID
6 #define DEVICE_TYPE "iotdeviceproject" //DEVICE TYPE MENTIONED IN IOT WATSON PLATFORM
7 #define DEVICE_ID "129714" //DEVICE ID MENTIONED IN IOT WATSON PLATFORM
8 #define TOKEN "24681812" //token
9 String data1;
10 float dist;
11 //-----customize the above value-----
12 char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; //server name
13 char publishTopic[] = "ultrasonic/evt/Data/Fmt/json"; //topic name and type of event perform
14 // and format in which data to be send
15 char subscribeTopic[] = "ultrasonic/cmd/test/Fmt/String"; //cmd represent Command type and
16 // command is test of format STRING
17 char authMethod[] = "oss-token-auth"; //authentication method
18 char token[] = TOKEN;
19 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID; //CLIENT ID
20 //-----
21 WiFiClient wifiClient; // creating an instance for wifiClient
22 PubSubClient client(server, 1883, callback, wifiClient); //calling the predefined client id
23 // by passing parameter like server id, port and wifi credential
24 int led = 4;
25 int trig = 5;
26 int echo = 6;
27 void setup()
28 {
29   Serial.begin(115200);
30   pinMode(trig, OUTPUT);
```

```
WOKWI  
SAVE SHARE  
Docs  
sketch.ino diagram.json libraries.txt Library Manager  
31 pinMode(echo,INPUT);  
32 pinMode(LED,OUTPUT);  
33 delay(10);  
34 wifiConnect();  
35 mqttConnect();  
36 }  
37 void loop()//recursive function.  
38 {  
39   digitalWrite(trig,LOW);  
40   digitalWrite(trig,HIGH);  
41   delayMicroseconds(10);  
42   digitalWrite(trig,LOW);  
43   float dur=pulseIn(echo,HIGH);  
44   float dist=(dur * 0.0343)/2;  
45   Serial.print("distance in cm");  
46   Serial.println(dist);  
47   PublishData(dist);  
48   delay(1000);  
49   if (!client.loop()){  
50     mqttConnect();  
51   }  
52 }  
53 /*.....retriving to cloud.....*/  
54 void PublishData(float dist){  
55   mqttConnect();//function call for connecting to the  
56   /*creating the string in form of JSON to update the data to the cloud*/  
57   String object;  
58   if(dist>100){  
59     {  
60       digitalWrite(LED,HIGH);
```

```
WOKWI  
SAVE SHARE  
Docs  
sketch.ino diagram.json libraries.txt Library Manager  
61 Serial.println("no object is near");  
62 object="Near";  
63 }  
64 else  
65 {  
66   digitalWrite(LED,LOW);  
67   Serial.println("no object found");  
68   object="No";  
69 }  
70 String payload="{\"distance\":";  
71 payload +=dist;  
72 payload +="," \"object\":\"";  
73 payload += object;  
74 payload += "\"}";  
75  
76 Serial.print("Sending payload: ");  
77 Serial.println(payload);  
78 if(client.publish(publishtopic, (char*) payload.c_str())){  
79   Serial.println("Publish ok");// if its successfully upload data on the cloud then it will print  
80   publish ok in serial monitor or else it will print publish failed//  
81 } else{  
82   Serial.println("Publish failed");  
83 }  
84 }  
85 void mqttConnect(){  
86   if(!client.connected()){  
87     Serial.print("Reconnecting client to ");  
88     Serial.println(server);  
89     while(!client.connect(clientid,authMethod, token)){  
90       Serial.print(".");  
91       delay(300);
```



**OUTPUT:**

DATA IS SENT TO IBM CLOUD WHEN NO OBJECT IS DETECTED



When no object is detected



Data is sent to ibm cloud when object is detected



When object is detected in ultrasonic detector

