Assignment -4
Python Programming

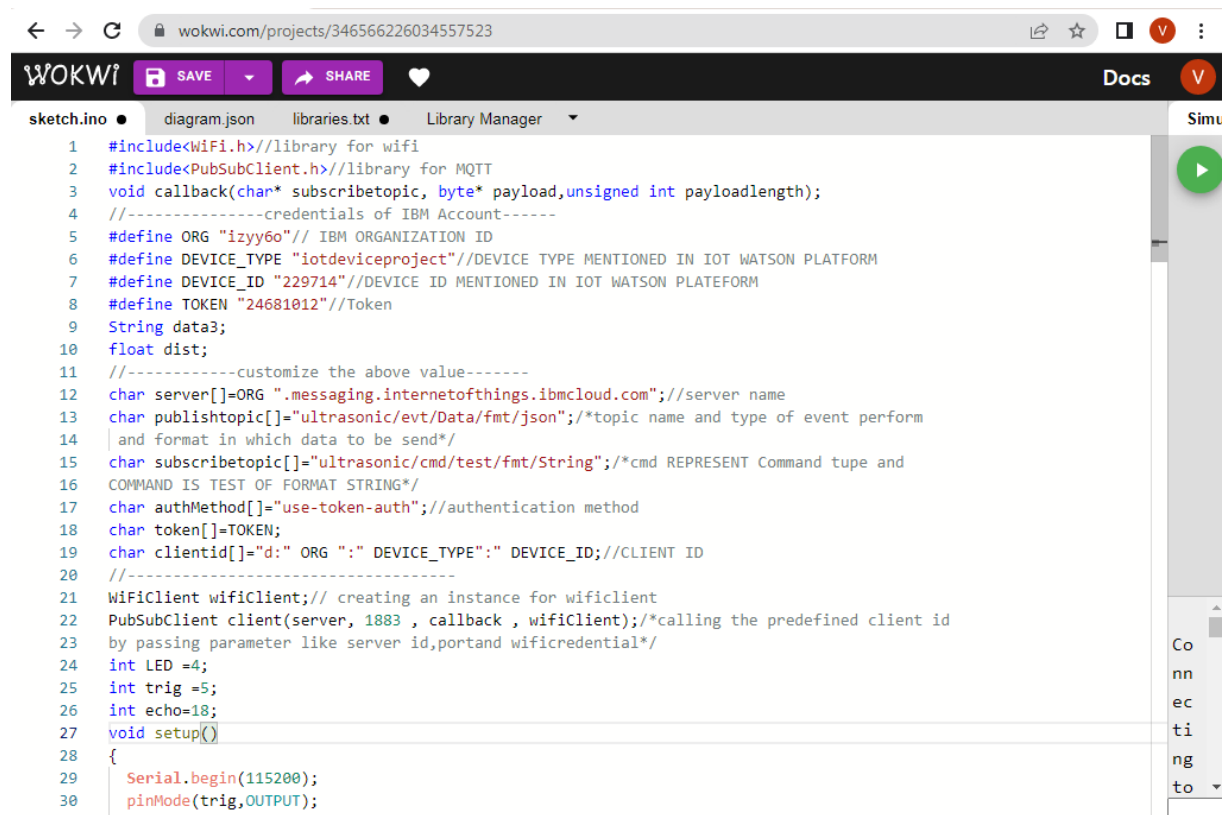| Assignment Date	25 October 2022
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Student Roll Number	720819106107
Maximum Marks	2 Marks

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:

```
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 ibm
56    /*creating the string in form of JSON to update the data to ibm cloud*/
57    String object;
58    if(dist<100)
59    {
60      digitalWrite(LED,HIGH);
```

```
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 sucessfully 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(500);
```

```
 92        }
 93        initManagedDevice();
 94        Serial.println();
 95      }
 96   }
 97   void wificonnect()//function defenition for wificonnect
 98   {
 99     Serial.println();
100     Serial.print("Connecting to ");
101     WiFi.begin("Wokwi.GUEST", "",6);//PASSING THE WIFI CREDIDENTIALS TO ESTABLISH CONNECTION
102     while (WiFi.status() !=WL_CONNECTED){
103       delay(500);
104       Serial.print(".");
105     }
106     Serial.println("");
107     Serial.println("WiFi connected");
108     Serial.println("IP address");
109     Serial.println(WiFi.localIP());
110   }
111   void initManagedDevice(){
112     if(client.subscribe(subscribetopic)){
113       Serial.println((subscribetopic));
114       Serial.println("subscribe to cmd OK");
115     }else{
116       Serial.println("subscribe to cmd failed");
117     }
118   }
119   void callback(char* subscribetopic,byte*payload,unsigned int payloadLength)
120   {
121     Serial.print("callback invoked for topic: ");
122     Serial.println(subscribetopic);
```

```
123     for(int i=0; i< payloadLength; i++){
124       //Serial.print((char)payload[i]);
125       data3 +=(char)payload[i];
126     }
127     //Serial.println("dta: "+ data3);
128     //if(data3=="Near")
129     //{
130     //Serial.println(data3);
131     //digitalWrite(LED,HIGH);
132     //}
133     //else
134     //{
135     //Serial.println(data3);
136     //digitalWrite(LED,LOW);
137     //}
138     data3="";
139   }
```

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

| DISTANCEDETECT | Disconnected | ULTRASON | Device | Oct 20, 2022 9:46 AM |

Identity   Device Information   Recent Events   State   Logs

Event	Value	Format	Last Received
Data	{"distance":79.66,"object":"Near"}	json	a few seconds ago
Data	{"distance":79.64,"object":"Near"}	json	a few seconds ago
Data	{"distance":79.66,"object":"Near"}	json	a few seconds ago
Data	{"distance":79.64,"object":"Near"}	json	a few seconds ago
Data	{"distance":79.66,"object":"Near"}	json	a few seconds ago

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When object is detected in ultrasonic detector


```
object is near
Sending payload: {"distance":97.82,"object":"Near"}
Publish ok
Distancein cm97.82
object is near
Sending payload: {"distance":97.82,"object":"Near"}
Publish ok
```