

Assignment -4

Python Programming

Assignment Date	10 October 2022
Student Name	Sathya.M
Student Roll Number	713319CS130
Maximum Marks	2 Marks

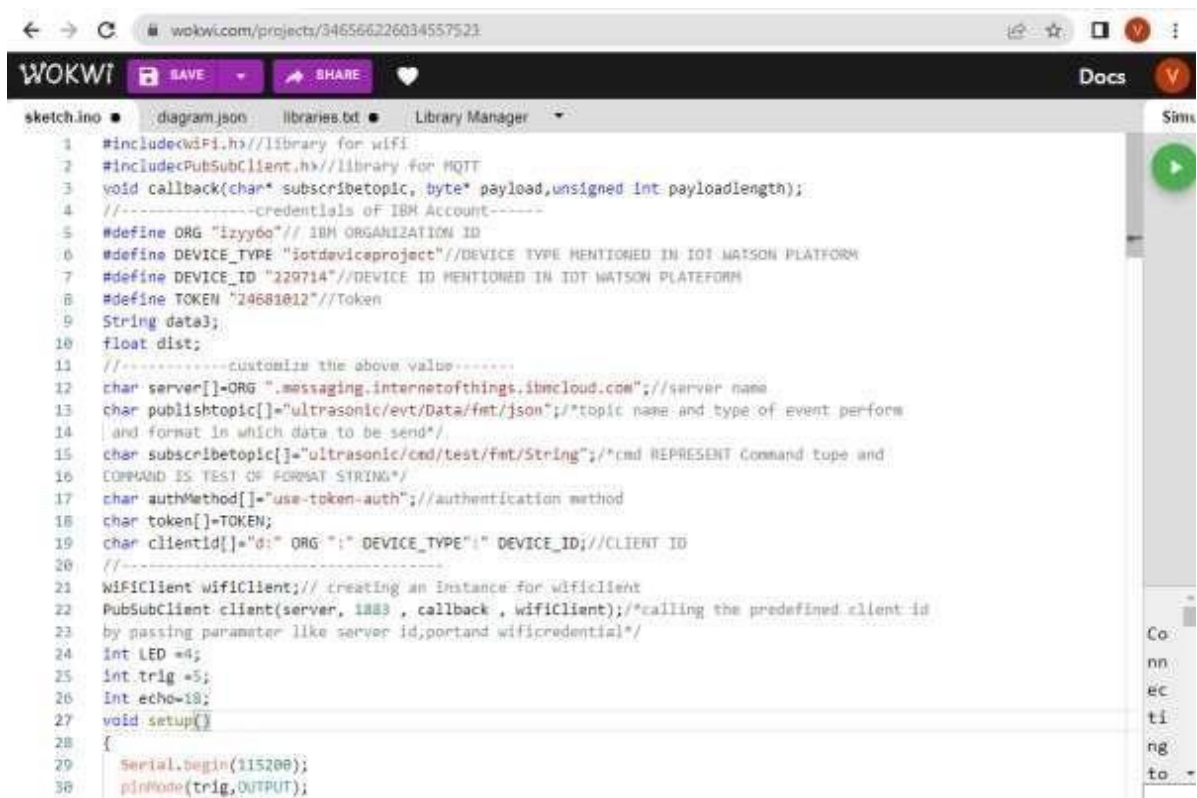
Question-1:

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 "iizyy6o" // IBM ORGANIZATION ID
6 #define DEVICE_TYPE "iotdeviceproject" //DEVICE TYPE MENTIONED IN IOT WATSON PLATFORM
7 #define DEVICE_ID "229714" //DEVICE ID MENTIONED IN IOT WATSON PLATFORM
8 #define TOKEN "24681@12" //Token
9 String data3;
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 tope and
16 //COMMAND IS TEST OF FORMAT STRING*/
17 char authMethod[] = "use-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 = 18;
27 void setup()
28 {
29   Serial.begin(115200);
30   pinMode(trig, OUTPUT);
```

← → C wokwi.com/projects/346566226034557523

WOKWI SAVE SHARE Docs

sketch.ino diagram.json libraries.txt Library Manager Simu

```
92 }
93   initManagedDevice();
94   Serial.println();
95 }
96 }
97 void wificonnect()//function definition for wificonnect
98 {
99   Serial.println();
100   Serial.print("Connecting to ");
101   WiFi.begin("Wokwi.GUEST", "",6);//PASSING THE WIFI CREDENTIALS 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);
```

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The screenshot shows the Wokwi IDE interface with a project named 'wokwi.com/projects/346566226034557523'. The code in 'sketch.ino' is as follows:

```
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

The screenshot shows the IBM Cloud IoT Platform interface for a device named 'DISTANCEDTECT'. The device is in a 'Disconnected' state. The 'Recent Events' tab is selected, showing a list of events. The table below represents the data shown in the 'Recent Events' tab.

Event	Value	Format	Last Received
Data	[{"distance": "79 cm", "object": "Near"}]	json	2 hrs (second) ago
Data	[{"distance": "79 cm", "object": "Near"}]	json	2 hrs (second) ago
Data	[{"distance": "79 cm", "object": "Near"}]	json	2 hrs (second) ago
Data	[{"distance": "79 cm", "object": "Near"}]	json	2 hrs (second) ago
Data	[{"distance": "79 cm", "object": "Near"}]	json	2 hrs (second) ago

Items per page: 50 | 1 of 2 items

When no object is detected

DISTANCEDetect				Disconnected	ULTRASON	Device	Oct 20, 2022 9:46 AM
Identity	Device Information	Recent Events	State	Logs			
<p>HC-SR04 ultrasonic sensor can detect the distance of an object in range of 2cm to 400cm.</p>							
Event	Value	Format	Last Received				
Data	{distance: 79.82, object: "Near"}	json	a few seconds ago				
Data	{distance: 79.82, object: "Near"}	json	a few seconds ago				
Data	{distance: 79.82, object: "Near"}	json	a few seconds ago				
Data	{distance: 79.82, object: "Near"}	json	a few seconds ago				
Data	{distance: 79.82, object: "Near"}	json	a few seconds ago				

Items per page: 50 | 1 of 2 items

When object is detected in ultrasonic detector

WOKWI

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Docs

sketch Simulation

diagram

library

Libra Mana

```

1 object is near
1 Sending payload: {"distance":97.82,"object":"Near"}
1 Publish ok
1 Distance in cm:97.82
2 object is near
2 Sending payload: {"distance":97.82,"object":"Near"}
2 Publish ok
2
2

```