

Assignment -4

Python Programming

Assignment Date	31 October 2022
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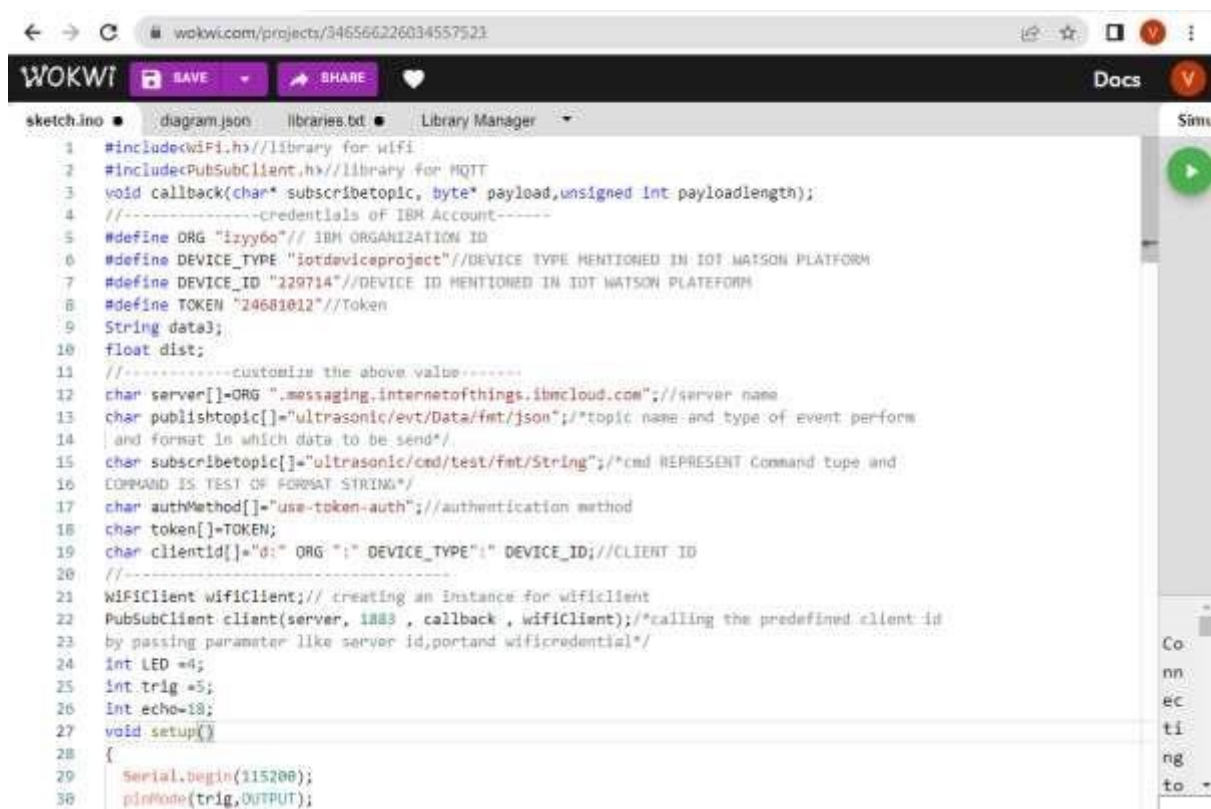
Question-1:

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 "i3yy6o" // 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 "24681012" //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 type and
16 //COMMAND IS TEST OF FORWAT 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);
```

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(500);
```

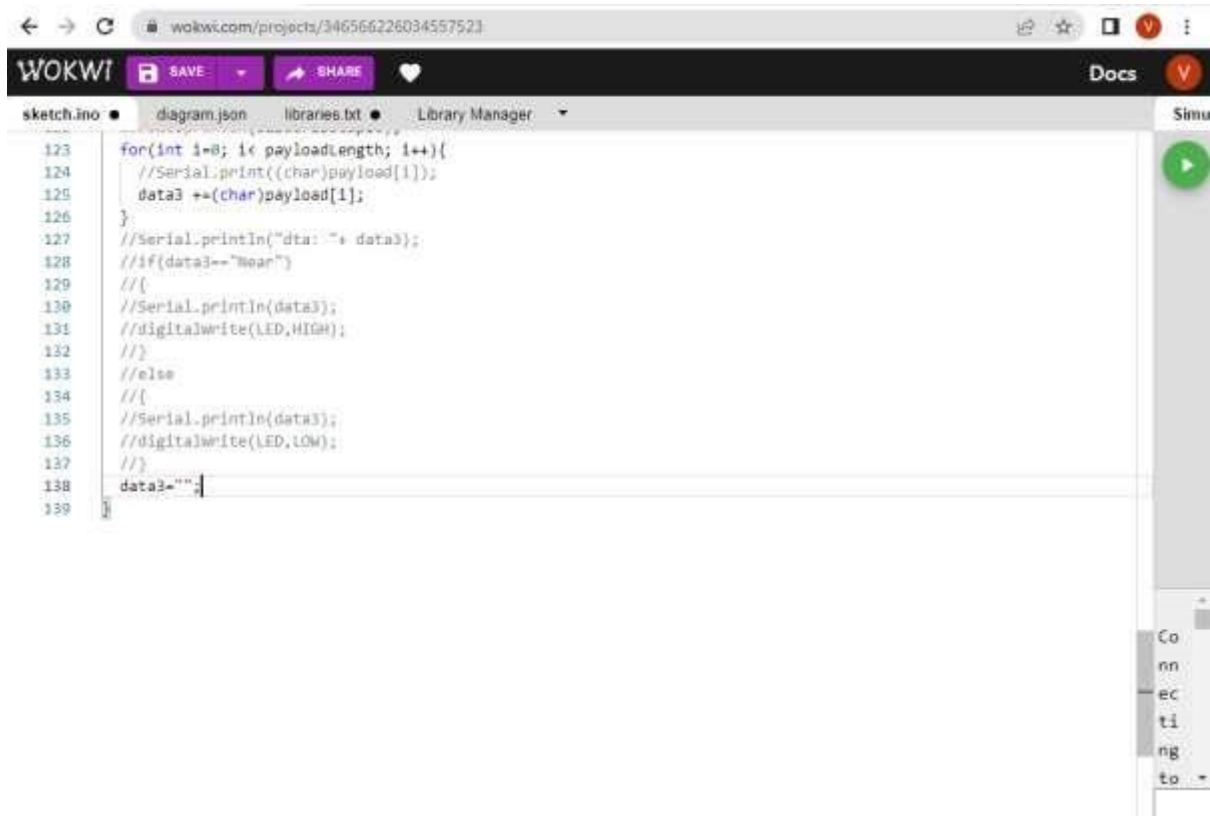
WOKWI

SAVE SHARE

Docs

sketch.ino diagram.json libraries.txt Library Manager

```
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 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);
```



OUTPUT:
DATA IS SENT TO IBM CLOUD WHEN NO OBJECT IS DETECTED

DISTANCEDETECT				
Disconnected		ULTRASON	Device	Oct 20, 2022 9:46 AM
Identity	Device Information	Recent Events	State	Logs
No record found. Add a new record to the log by clicking on the log icon in the top right corner.				
Event	Value	Format	Last Received	
Data	[{"distance": 79.68, "object": "Near"}]	json	a few seconds ago	
Data	[{"distance": 79.68, "object": "Near"}]	json	a few seconds ago	
Data	[{"distance": 79.68, "object": "Near"}]	json	a few seconds ago	
Data	[{"distance": 79.68, "object": "Near"}]	json	a few seconds ago	
Data	[{"distance": 79.68, "object": "Near"}]	json	a few seconds ago	

When no object is detected

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Add Device

DistanceDetect **Disconnected** **ULTRASON** **Device** **Oct 20, 2022 9:46 AM**

Identity **Device Information** Recent Events State Logs

The world is full of things you can't see. You can't see it until you're looking at it.

Event	Value	Email	Last Received
Data	"Distance": "79 cm", "object": "Near"	post	a few seconds ago
Data	"Distance": "79 cm", "object": "Near"	post	a few seconds ago
Data	"Distance": "79 cm", "object": "Near"	post	a few seconds ago
Data	"Distance": "79 cm", "object": "Near"	post	a few seconds ago
Data	"Distance": "79 cm", "object": "Near"	post	a few seconds ago

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When object is detected in ultrasonic detector

