

Assignment -4

Python Programming

Assignment Date	30 October2022
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Maximum marks	2 Marks

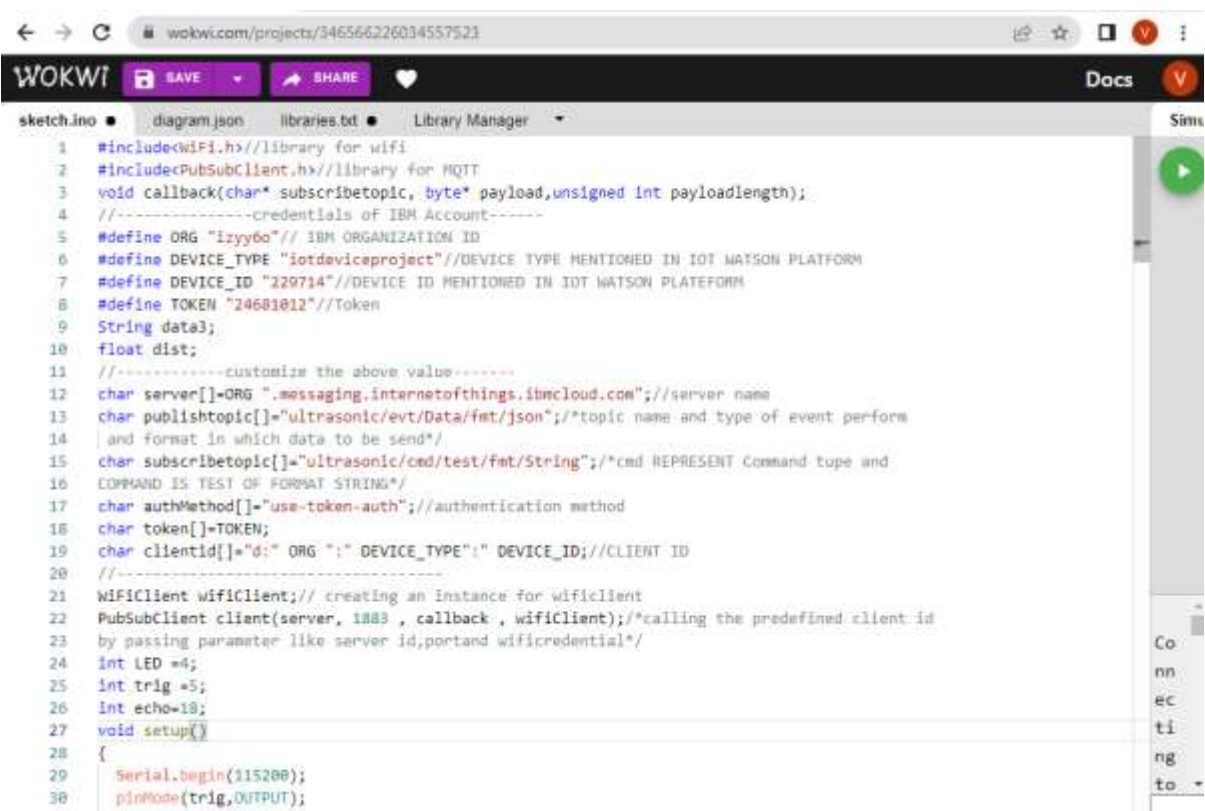
Question-1:

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 "iyy6o" // 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 tupe 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,portand wificredential*/
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.com/projects/346566226034557523

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 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);
```

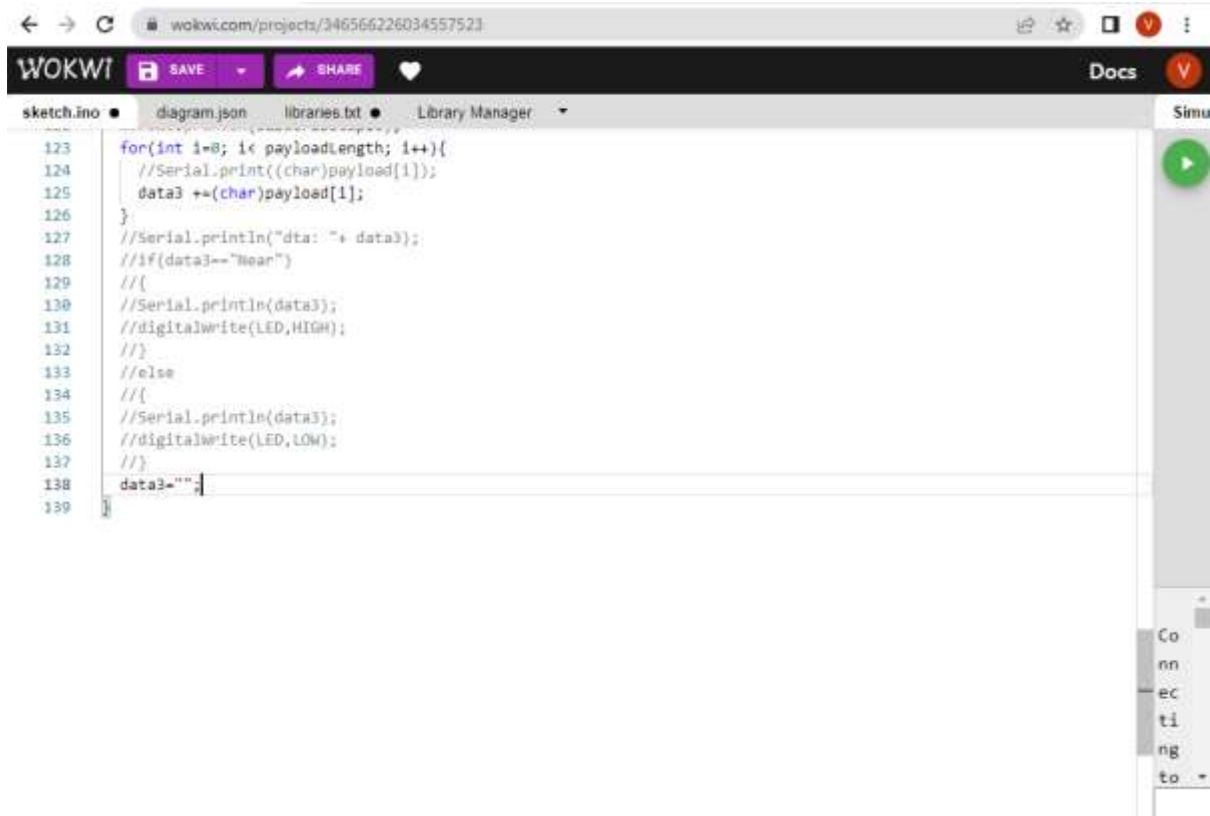
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Docs

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 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);
```



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
<div> <div>Event</div> <div>Value</div> <div>Format</div> <div>Last Received</div> </div>				
Data	[{"distance":79.64,"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	

When no object is detected

Browse

Action

Device Types

Interfaces

Add Device

▼

■

DISTANCEDetect

Disconnected

ULTRASON

Device

Oct 20, 2022 9:46 AM

→ ...

Identity

Device Information

Recent Events

State

Logs

✕

This module sends data to the Wokwi cloud when it receives data from the sensor.

Event	Value	Format	Last Received
Data	["distance":97.82,"object":"Near"]	json	a few seconds ago
Data	["distance":97.82,"object":"Near"]	json	a few seconds ago
Data	["distance":97.82,"object":"Near"]	json	a few seconds ago
Data	["distance":97.82,"object":"Near"]	json	a few seconds ago
Data	["distance":97.82,"object":"Near"]	json	a few seconds ago

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1

When object is detected in ultrasonic detector

← → ↺

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WOKWI

SAVE

SHARE

♥

Docs

🔴

sketch

Simulation

diagram

library

Libraries

Manager

```

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
2

```