

Assignment -4

Python Programming

Assignment Date	26 October 2022
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Maximum Marks	2 Marks

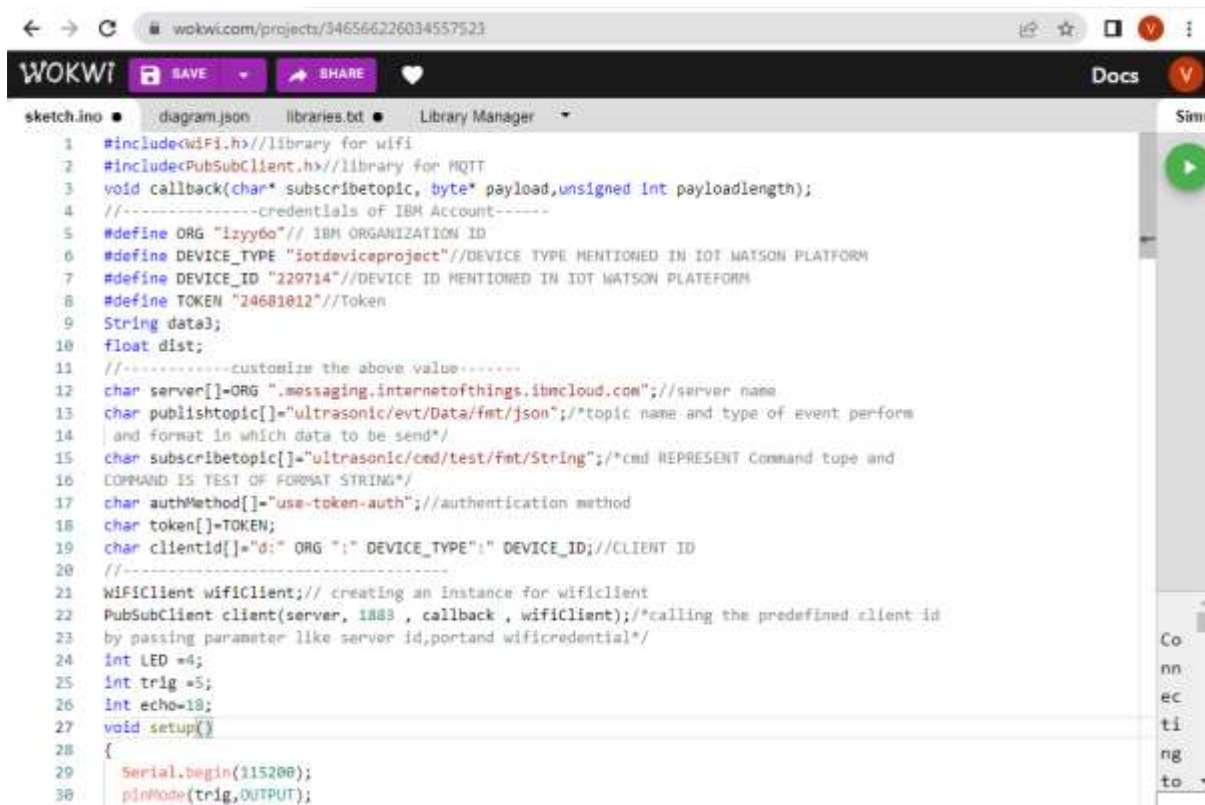
Question-1:

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* subscribtopic, byte* payload, unsigned int payloadlength);
4 //-----credentials of IBM Account-----
5 #define ORG "izyy6o"// 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 "24681812"//Token
9 String data3;
10 float dist;
11 //-----customize the above value-----
12 char server[]=ORG ".messaging.internetofthings.ibmcloud.com";//server name
13 char publishstopic[]="ultrasonic/evt/Data/fmt/json";//topic name and type of event perform
14 | and format in which data to be send*/
15 char subscribtopic[]="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

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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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```
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", "");/*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);
```

```
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

Event	Value	Format	Last Received
Data	[\"distance\":\"79.66\",\"object\":\"Near\"]	json	a few seconds ago
Data	[\"distance\":\"79.66\",\"object\":\"Near\"]	json	a few seconds ago
Data	[\"distance\":\"79.66\",\"object\":\"Near\"]	json	a few seconds ago
Data	[\"distance\":\"79.66\",\"object\":\"Near\"]	json	a few seconds ago
Data	[\"distance\":\"79.66\",\"object\":\"Near\"]	json	a few seconds ago

When no object is detected

DISTANCEDETECT				Disconnected	ULTRASON	Device	Oct 20, 2022 9:46 AM	→ ...
Identity	Device Information	Recent Events	State	Logs				
This would normally be a table of data from a device, but it's empty for now.								
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					

When object is detected in ultrasonic detector

← → ↺

wokwi.com/projects/346572482591851092

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Docs

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sketch

Simulation

diagram

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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
2

```

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