

Assignment -4
Python Programming

Assignment Date	26 October 2022
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Maximum Marks	2 Marks

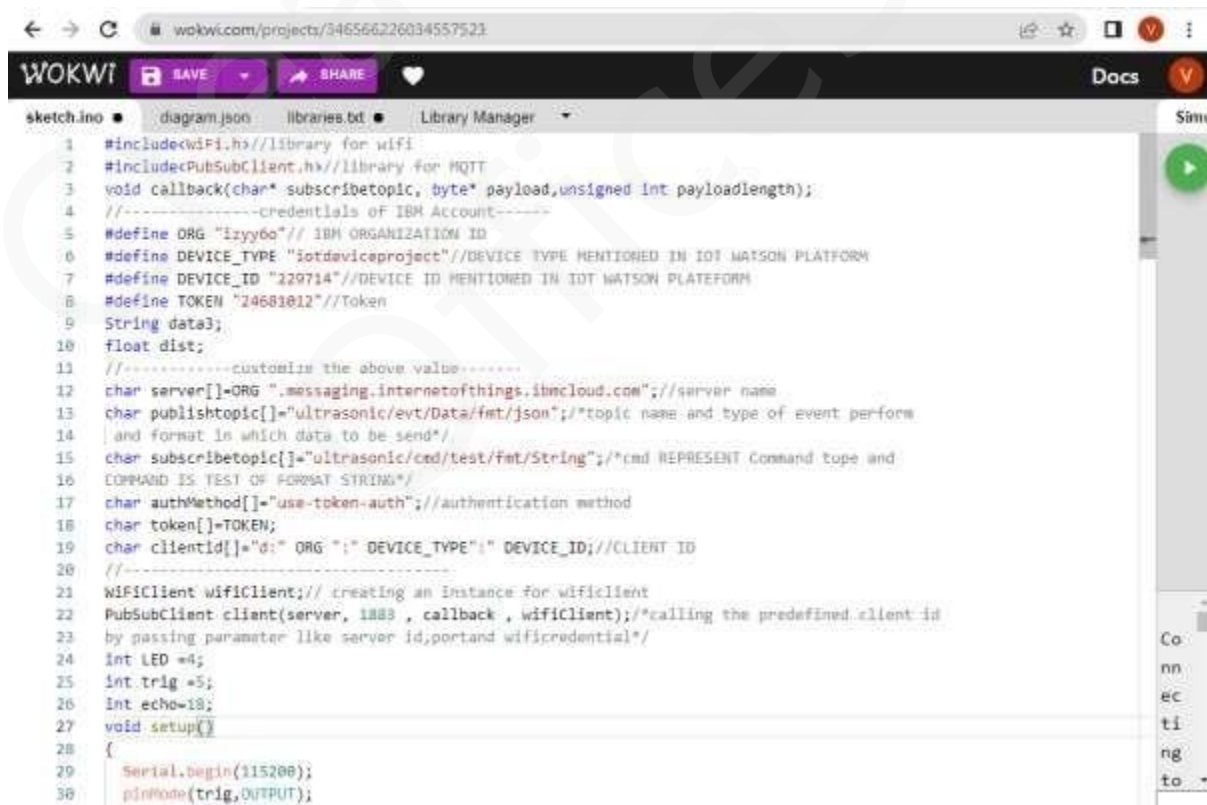
Question-1:

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* topic, 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 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 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 = 10;
27 void setup()
28 {
29   Serial.begin(115200);
30   pinMode(trig, OUTPUT);
```

← → ↻ wokwi.com/projects/346566226034557523

WOKWI SAVE SHARE

Docs

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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", "",0);//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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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

Browser Action Device Types Interfaces Add Device

DISTANCEDetect

Disconnected

ULTRASON

Device

Oct 20, 2022 9:46 AM

Identity

Device Information

Recent Events

State

Logs

This device is not connected to the cloud. It is a remote device and is not connected to the cloud.

Event	Value	Format	Last Received
Data	{\"Distance\": 79.64, \"Object\": \"Near\"}	json	a few seconds ago
Data	{\"Distance\": 79.64, \"Object\": \"Near\"}	json	a few seconds ago
Data	{\"Distance\": 79.64, \"Object\": \"Near\"}	json	a few seconds ago
Data	{\"Distance\": 79.64, \"Object\": \"Near\"}	json	a few seconds ago
Data	{\"Distance\": 79.64, \"Object\": \"Near\"}	json	a few seconds ago

Items per page: 50 1 of 2 items

When no object is detected

Browser Active Device Types Interfaces Add Device

▼ DISTANCEDetect Disconnected ULTRASON Device Oct 20, 2022 9:46 AM → ...

Identity Device Information Recent Events State Logs ✕

HC-SR04 module is a non-contact type of distance measuring sensor using ultrasonic waves.

Event	Value	Format	Last Received
Data	[{"distance": 99.66, "object": "Near"}]	json	a few seconds ago
Data	[{"distance": 99.64, "object": "Near"}]	json	a few seconds ago
Data	[{"distance": 99.66, "object": "Near"}]	json	a few seconds ago
Data	[{"distance": 99.64, "object": "Near"}]	json	a few seconds ago
Data	[{"distance": 99.66, "object": "Near"}]	json	a few seconds ago

Items per page: 50 1 of 2 items 1 of 1 page 1

When object is detected in ultrasonic detector

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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

```

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