

## Assignment -4

### Python Programming

Assignment Date	02 November 2022
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Maximum Marks	2 Marks

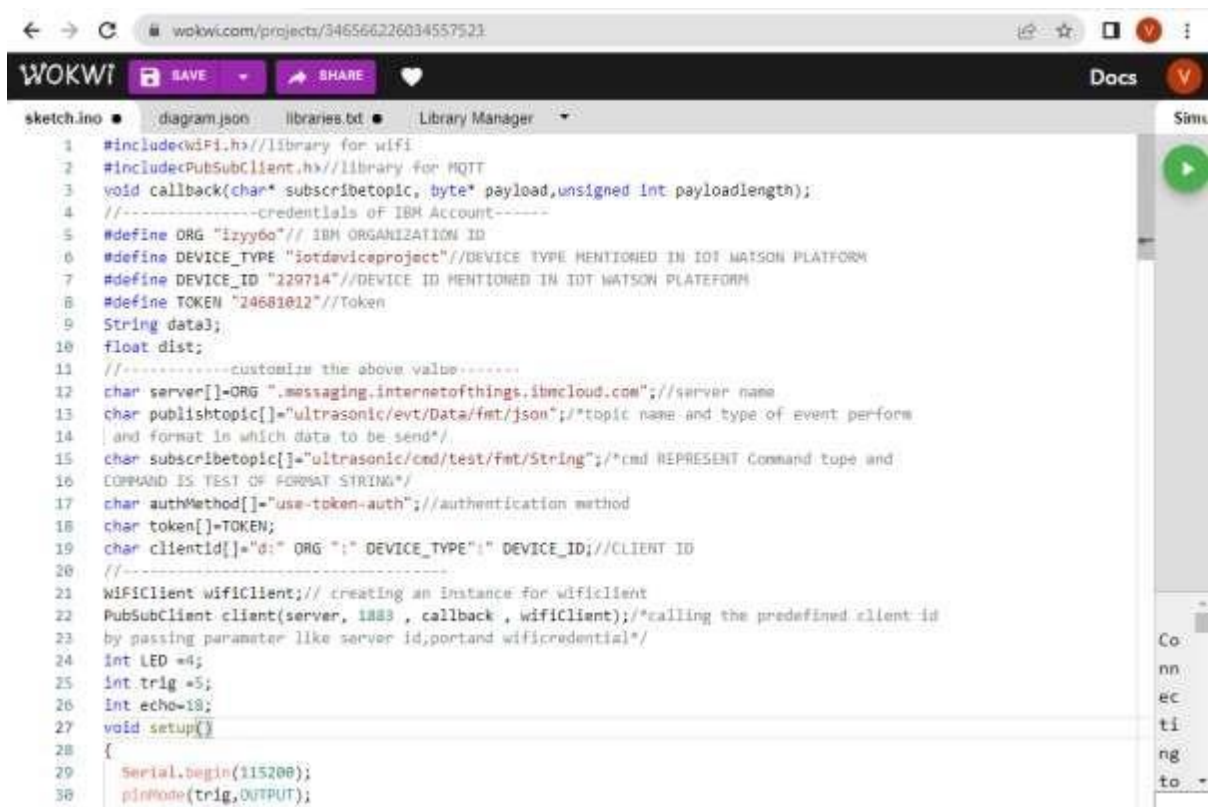
#### Question-1:

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* subscribetopic, 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 "24681812" //Token
9 String data1;
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 credentials*/
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

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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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sketch.ino diagram.json libraries.txt Library Manager
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 Actions Device Types Interfaces Add Device

DISTANCEDTECT					Disconnected	ULTRASON	Device	Oct 20, 2022 9:46 AM	→ ...
Identity	Device Information	Recent Events	State	Logs					
No events found. Click on the right-hand side of the table to add new events and logs.									
Event	Value	Format	Last Received						
Data	[{"distance": "79.64", "object": "Near"}]	json	4 hrs, 26 mins, 41 secs ago						
Data	[{"distance": "79.64", "object": "Near"}]	json	4 hrs, 26 mins, 41 secs ago						
Data	[{"distance": "79.64", "object": "Near"}]	json	4 hrs, 26 mins, 41 secs ago						
Data	[{"distance": "79.64", "object": "Near"}]	json	4 hrs, 26 mins, 41 secs ago						
Data	[{"distance": "79.64", "object": "Near"}]	json	4 hrs, 26 mins, 41 secs ago						

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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 - 2022-10-20 09:46:00 - New type of object is detected with a range of 97.82 cm</p>							
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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When object is detected in ultrasonic detector

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Docs

sketch Simulation

diagram library

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```

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

```