

**Assignment -4**  
**Python**  
**Programming**

Assignment Date	25 October 2022
Student Name	K.Muthulakshmi
Student Roll Number	953319104017
Maximum Marks	2 Marks

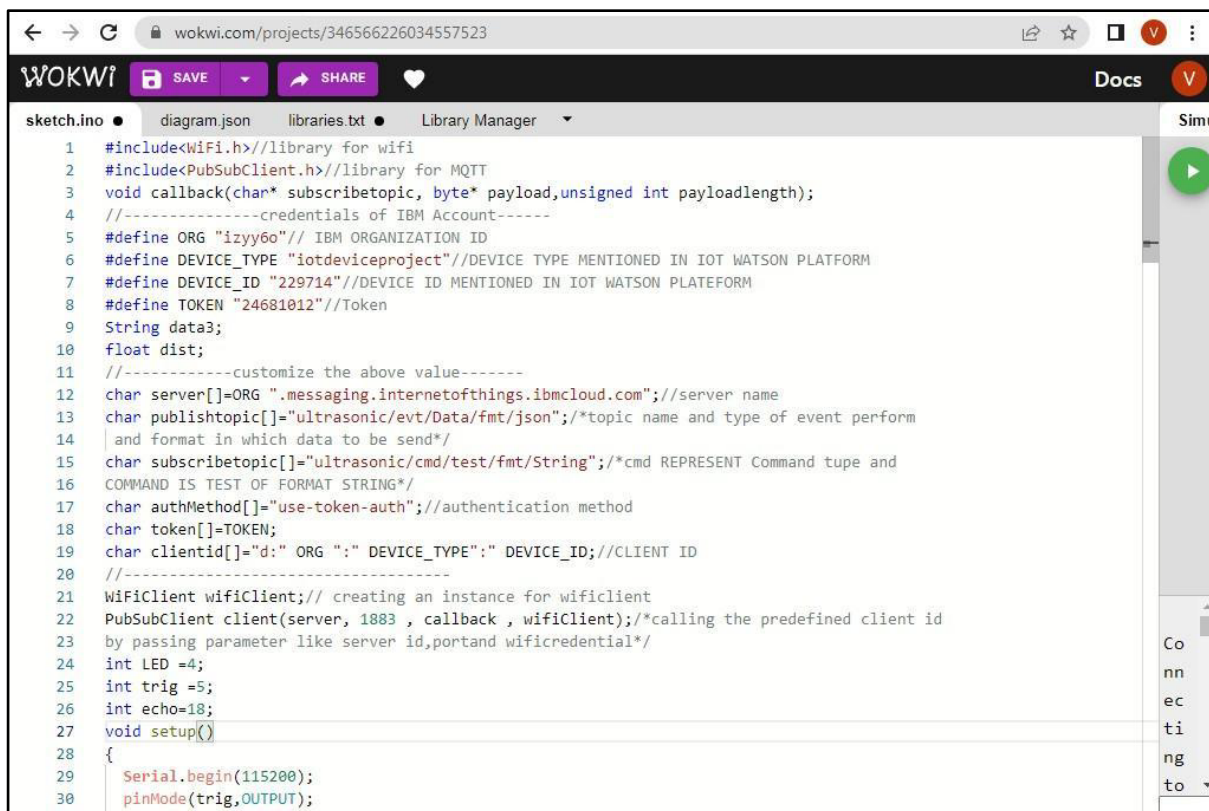
**Question-1:**

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 "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 "24681012"//Token
9 String data3;
10 float dist;
11 //-----customize the above value-----
12 char server[]="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);
```

sketch.ino B diagram.jsp libraries.at B

Library Manager

```

31 pi n £\Ode {echo, INRUT};
32 pi n £\Ode {LED, OUTPUT};
33 delay (1B);
34 ulfl connect ();
35 mqttconnect();
}

39 digitalWrite (trig,LON); se
dig it at Nr te (tr 'ig, HIGH);
41 delayMicroseconds(10);
42 digitalWrite(trig,LOW);
43 float dur=oul sel n (echo,HIGH);
44 float dist=(dur * B . â343) /2;
45 Serial.pri nt ( "distance in cm™");
46 serial.pri n (dist);
a7 pub11shoata{dist;
as deTay (taaa);
49 if (! client.loDp()) {
5» mqttconnect();
51 }
52 }
53 /*.....ret iving to cloud.
54 void PublishData(float dist){
55 mqttconnect();//function caii for connecting to ibm
56 6 /* c'e at ing l he st ping 1n fo pn a' 3 SON to update l he data to i bo cloud*/

58 if(dist<i00)

66 dig it alv rle {LED, HI sH};

```



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```

61 Serial.println("no object is near");
62 object="Hear";
63 }
64 else
65 {
66 digitalWrite(LED,LDW);
67 Serial.println("no object found");
68 object="No";
69 }
70 String payload="{\"distance\":";

72 payload += , \" object\": \" \";
73 payload += object;

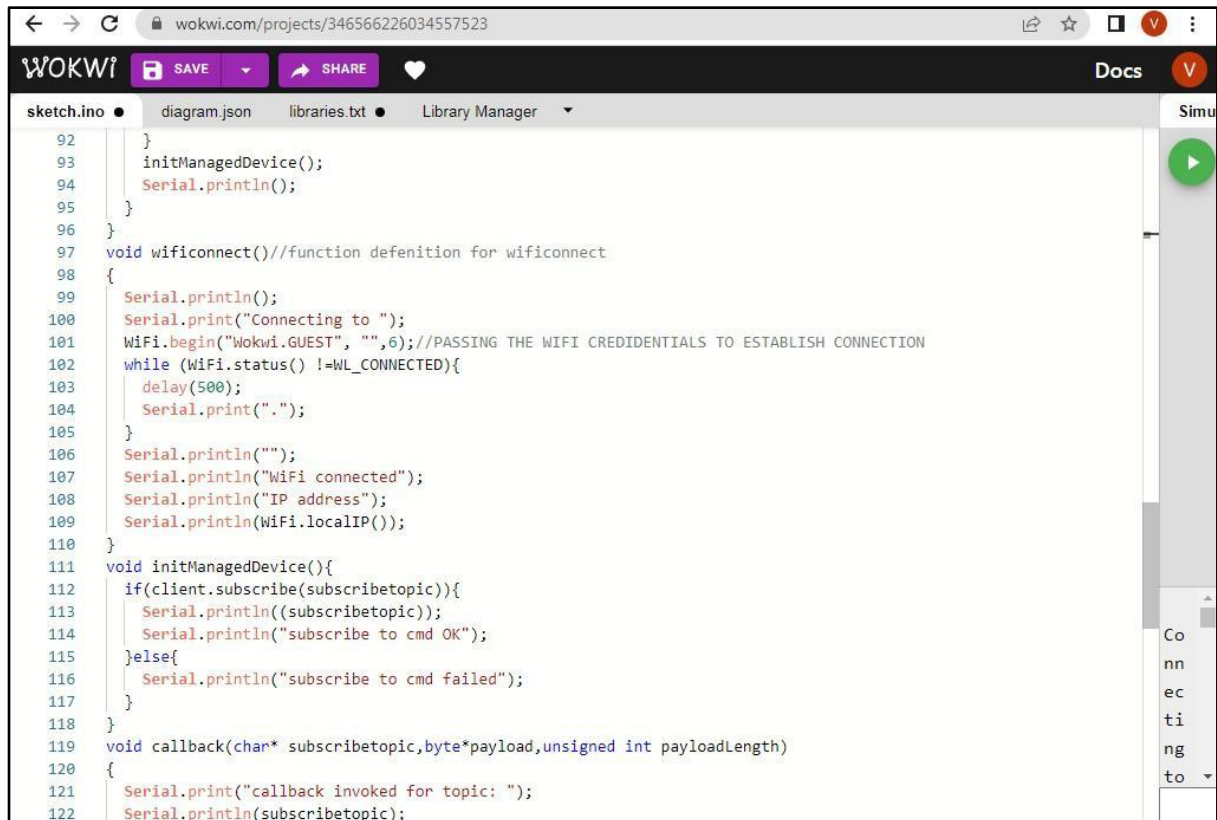
76 Serial . pr nt ("S ending payload: ");
77 Serial1. nt1 n (payload);
78 i-F(client publish(publishtopic. (char*) payload . c_str())){
79 Serial . pr nt ("Publish ok™"); /* i-f suces sfu lly
upload data on the cloud then it will print
publish ok in serial moni t on or else it will print puDlish
T ai ted*/
81 } else{
82 Serial.println("Publish failed");
83 }
84
85 void mqttco nnect (){
86 i-F(! client.connected()){
87 Serial . p ri nt l ("Reconnec tin g rent l o ");
88 Serial . p ri nt 1 n (server);

```

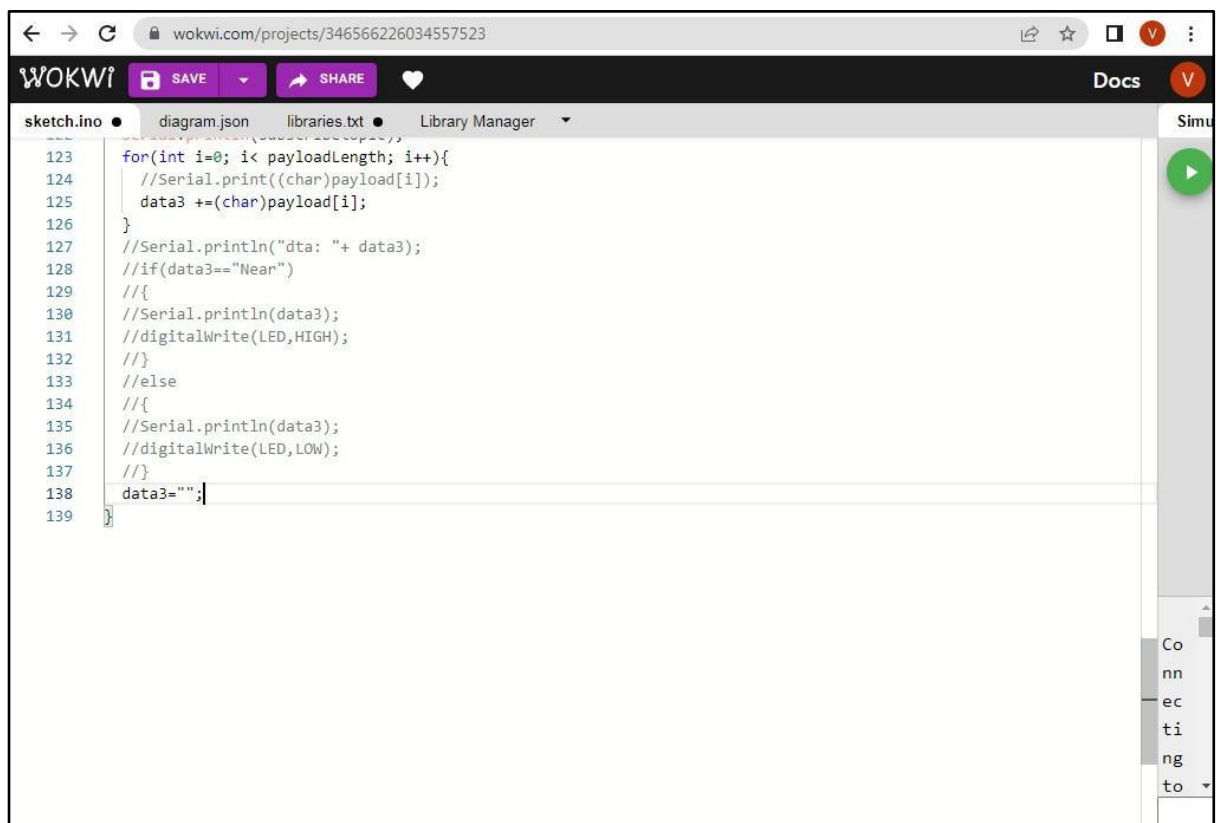


Co nn ec ti ng

90	Serial.print( . );
91	delay(500);



```
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);
```



```
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

DistanceDetect

Disconnected

ULTRASON

Device

Oct 20, 2022 9:46 AM

Identity

Device Information

Recent Events

State

Logs

This could signal a detection. The type of data that is being sent goes from this page.

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

Items per page: 50

1 of 2 items

1 of 1 page

When no object is detected

wokwi.com/projects/346572482591851092

WOKWI

SAVE

SHARE

Docs

sketch.ino

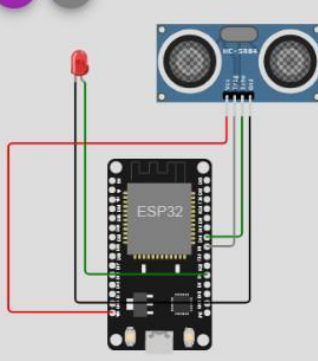
diagram.json

libraries.txt

Library Manager

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2 #include<PubSubClient.h>//library for MQ
3 void callback(char* subscribetopic, byte
4 //-----credentials of IBM Acco
5 #define ORG "izyy6o"// IBM ORGANIZATION
6 #define DEVICE_TYPE "iotdeviceproject"//
7 #define DEVICE_ID "229714"//DEVICE ID ME
8 #define TOKEN "24681012"//Token
9 String data3;
10 float dist;
11 //-----customize the above value-
12 char server[]=ORG ".messaging.internetof
13 char publishtopic[]="ultrasonic/evt/Data
14 and format in which data to be send*/
15 char subscribetopic[]="ultrasonic/cmd/te
16 COMMAND IS TEST OF FORMAT STRING*/
17 char authMethod[]="use-token-auth";//aut
18 char token[]=TOKEN;
19 char clientid[]="d:" ORG ":" DEVICE_TYPE
20 //-----
21 WiFiClient wifiClient;// creating an ins
22 PubSubClient client(server, 1883 , callb
23 by passing parameter like server id,port
24 int LED =4;
25 int trig =5;
26 int echo=18;
27 void setup()
28 {
29 Serial.begin(115200);
```

Simulation



no object found

Sending payload: {"distance":141.21,"object":"No"}

Publish ok

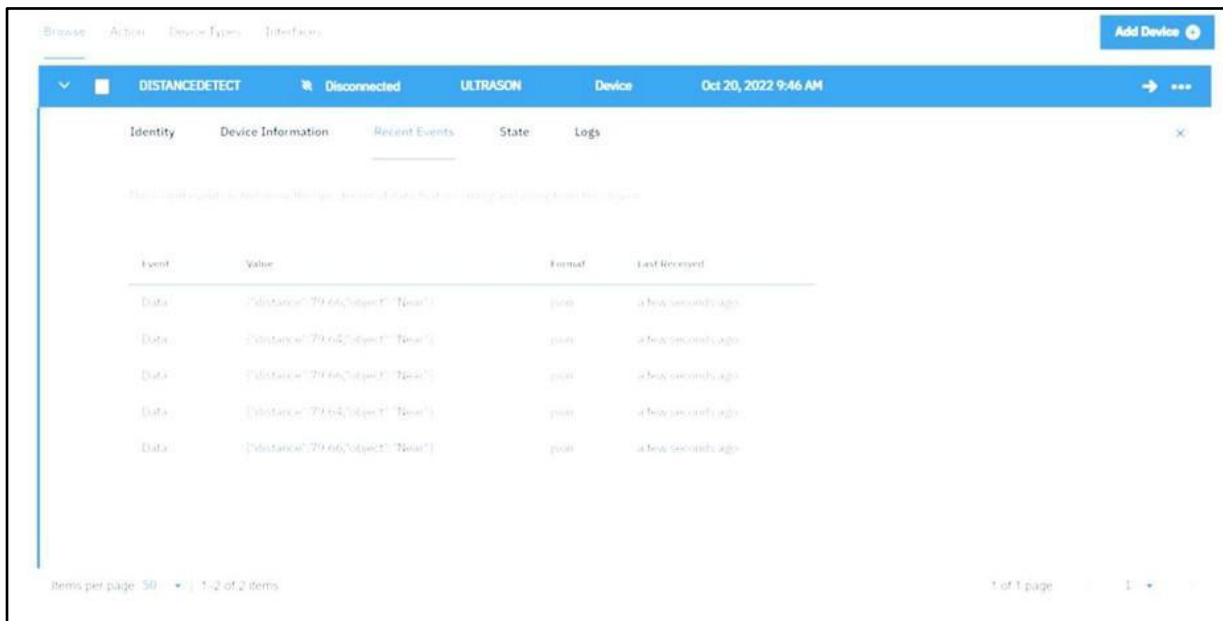
Distancein cm141.21

no object found

Sending payload: {"distance":141.21,"object":"No"}

Publish ok

Data is sent to ibm cloud when object is detected



When object is detected in ultrasonic detector

