

ASSIGNMENT-4

Assignment Date	25 October 2022
Student Name	K. ARTHI
Team Id	PNT2022TMID49915
Maximum Marks	4 Marks
Project title	Real time water quality monitoring and control system

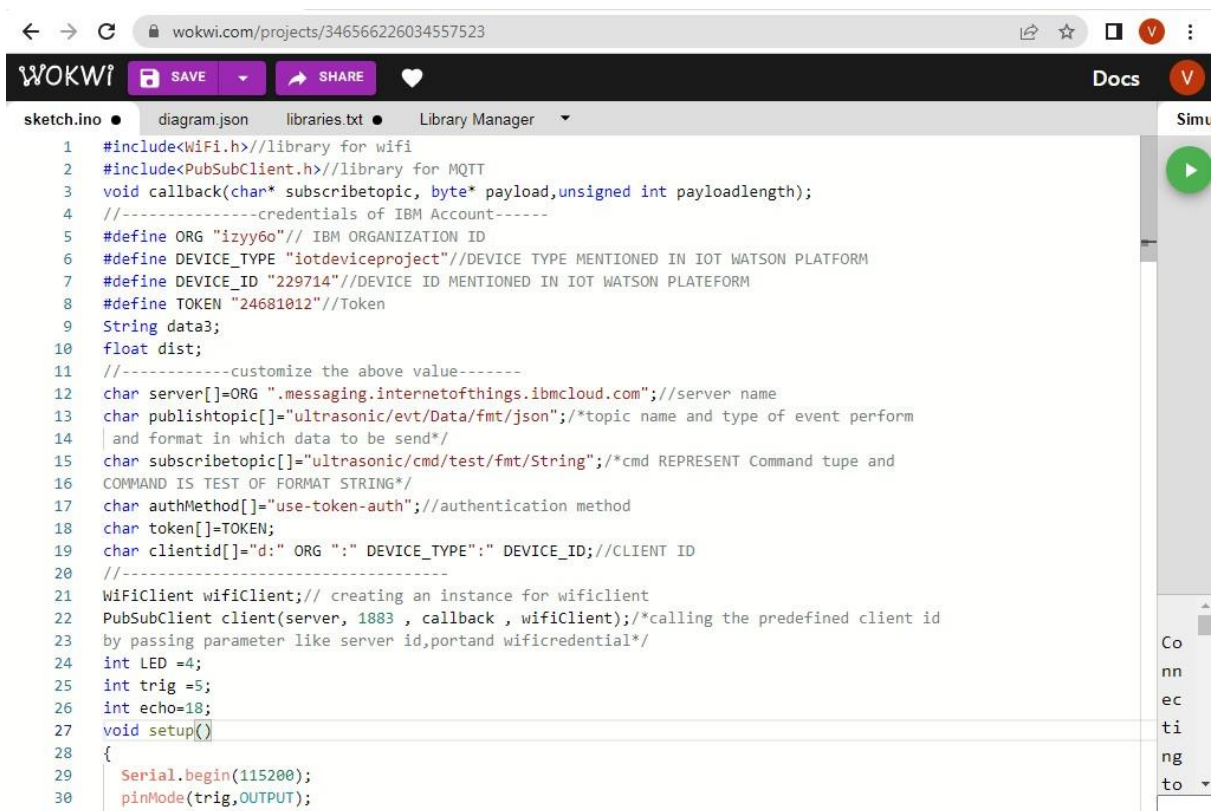
Question-1:

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[]=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);
31 }
```

← → ↻ wokwi.com/projects/346566226034557523

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sketch.ino diagram.json libraries.txt Library Manager

```
31 pinMode(echo,INPUT);
32 pinMode(LED,OUTPUT);
33 delay(10);
34 wificonnect();
35 mqttconnect();
36 }
37 void loop()//recursive function
38 {
39   digitalWrite(trig,LOW);
40   digitalWrite(trig,HIGH);
41   delayMicroseconds(10);
42   digitalWrite(trig,LOW);
43   float dur=pulseIn(echo,HIGH);
44   float dist=(dur * 0.0343)/2;
45   Serial.print("distance in cm");
46   Serial.println(dist);
47   PublishData(dist);
48   delay(1000);
49   if (!client.loop()){
50     mqttconnect();
51   }
52 }
53 /*.....retriving to cloud.....*/
54 void PublishData(float dist){
55   mqttconnect();//function call for connecting to ibm
56   /*creating the string in form of JSON to update the data to ibm cloud*/
57   String object;
58   if(dist<100)
59   {
60     digitalWrite(LED,HIGH);
```

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```
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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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);

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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

}

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Library Manager

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16 COMMAND IS TEST OF FORMAT STRING*/
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18 char token[]=TOKEN;
19 char clientid[]="d:" ORG ":" DEVICE_TYPE
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22 PubSubClient client(server, 1883 , callb
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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

Browse Action Device Types Interfaces

Add Device

DISTANCEDTECT Disconnected ULTRASON Device Oct 20, 2022 9:46 AM

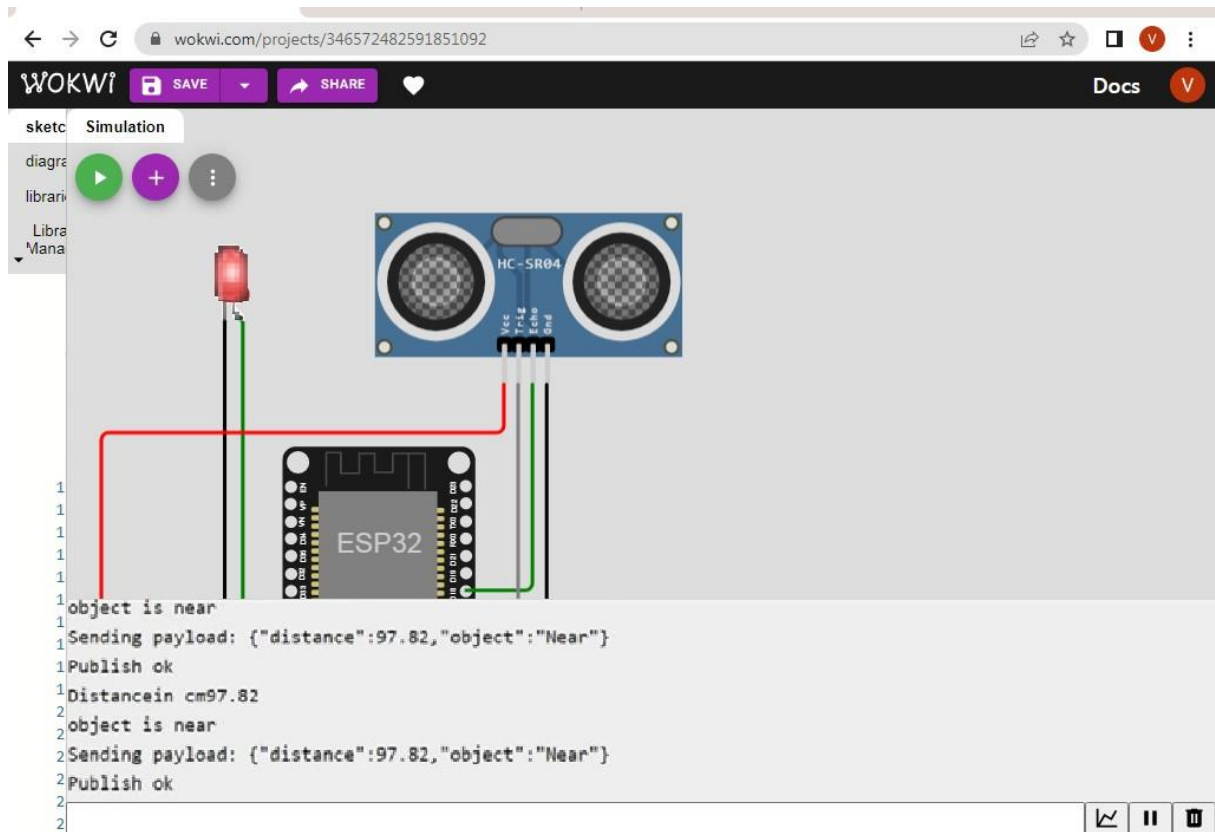
Identity Device Information Recent Events State Logs

Recent Events

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

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SIMULATION OUTPUT:



REFERENCE LINK:

<https://wokwi.com/projects/346566226034557523>

