

Assignment -4
Python Programming

Assignment Date	30 October2022
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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:

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sketch.ino

diagram.json

libraries.txt

Library Manager

Simu

```
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 "Izzy60" // IBM ORGANIZATION ID
6 #define DEVICE_TYPE "iotedeviceproject" //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 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 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 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);
```

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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 successfully 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", "",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

Event	Value	Format	Last received
Data	Distance: 79.64/object: Near	good	4 hours, 50 minutes, 11 seconds ago
Data	Distance: 79.64/object: Near	good	4 hours, 50 minutes, 11 seconds ago
Data	Distance: 79.64/object: Near	good	4 hours, 50 minutes, 11 seconds ago
Data	Distance: 79.64/object: Near	good	4 hours, 50 minutes, 11 seconds ago
Data	Distance: 79.64/object: Near	good	4 hours, 50 minutes, 11 seconds ago

When no object is detected

DistanceDetect

Disconnected

ULTRASON

Device

Oct 20, 2022 9:46 AM

Identity

Device Information

Recent Events

State

Logs

Hardware: Add a new device to the system and connect it to the system.

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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1 of 1 page

When object is detected in ultrasonic detector

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sketch

Simulation

diagram

library

Libra

Mana

HC-SR04

ESP32

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