

Assignment -4

Python Programming

Assignment Date	31 October 2022
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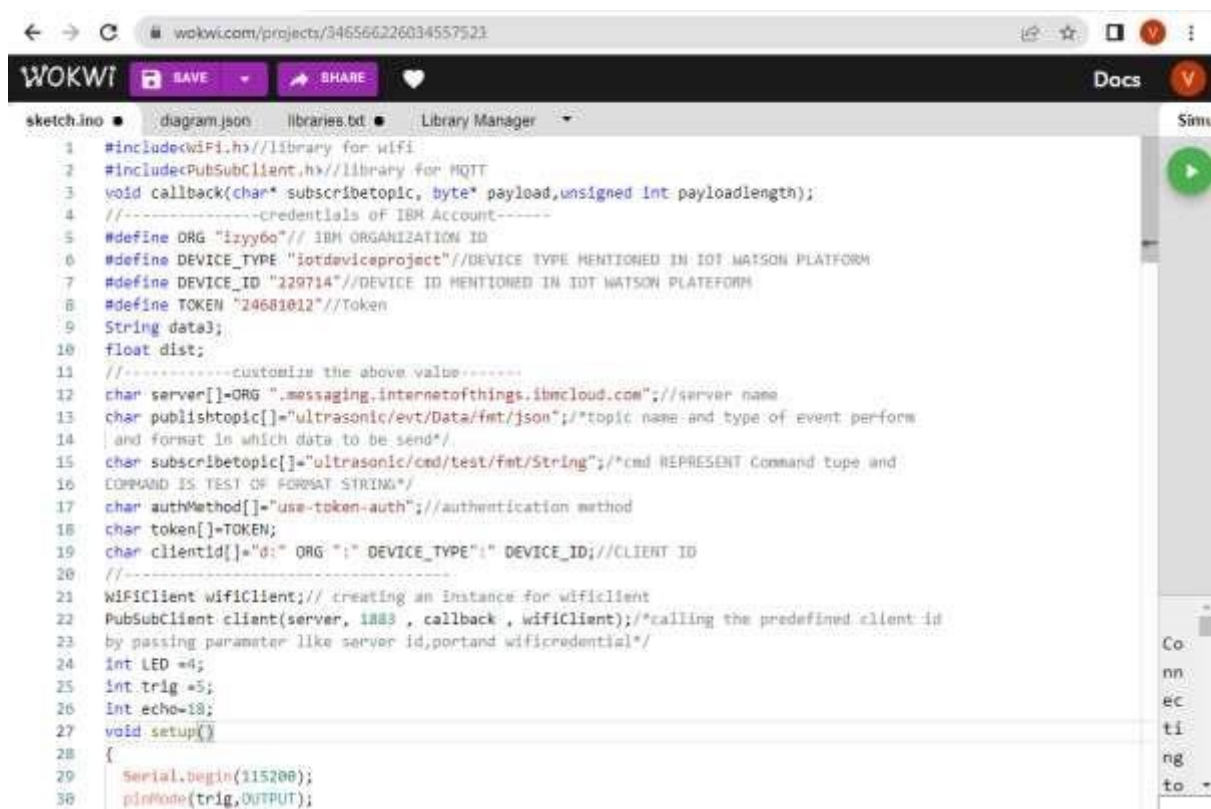
Question-1:

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 "i3yy6o" // 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 type and
16 //COMMAND IS TEST OF FORWAT 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 = 18;
27 void setup()
28 {
29   Serial.begin(115200);
30   pinMode(trig, OUTPUT);
```

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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 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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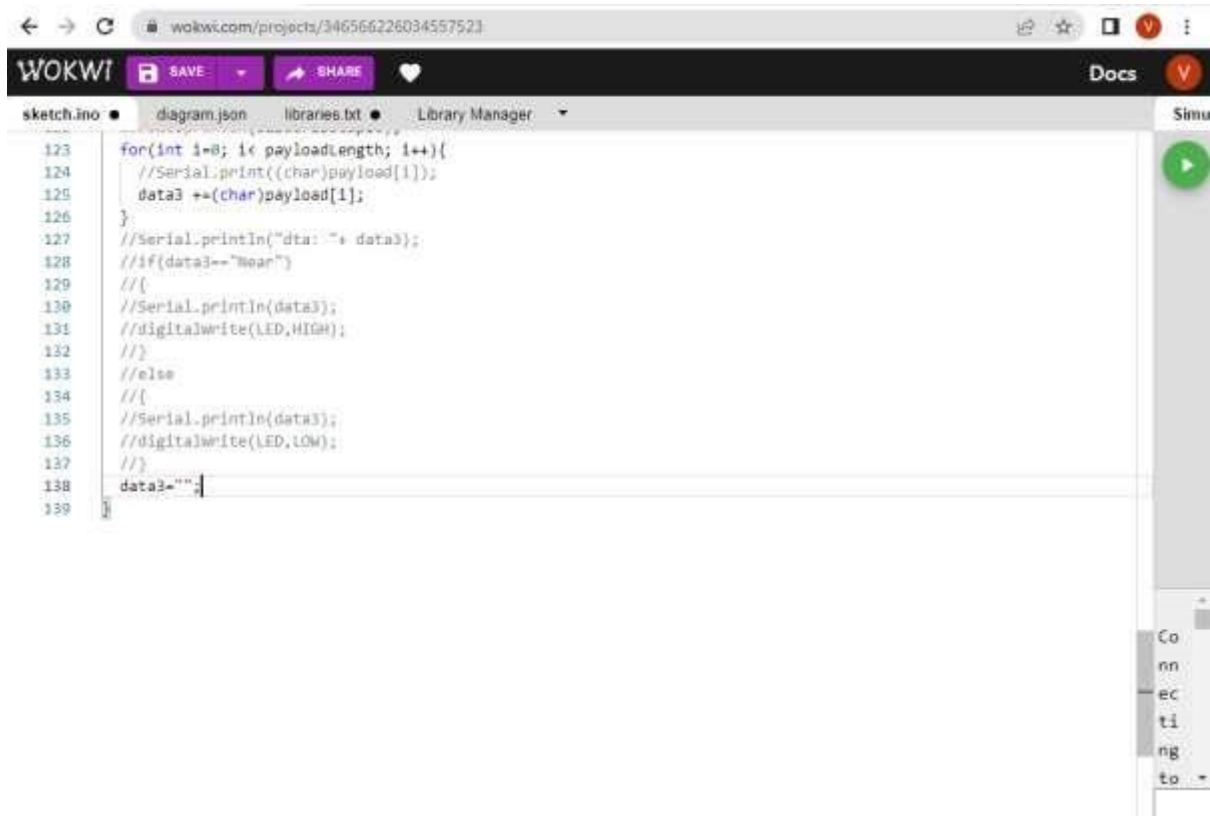
sketch.ino ● diagram.json libraries.txt ● Library Manager

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 CREDENTIALS TO ESTABLISH CONRECTION
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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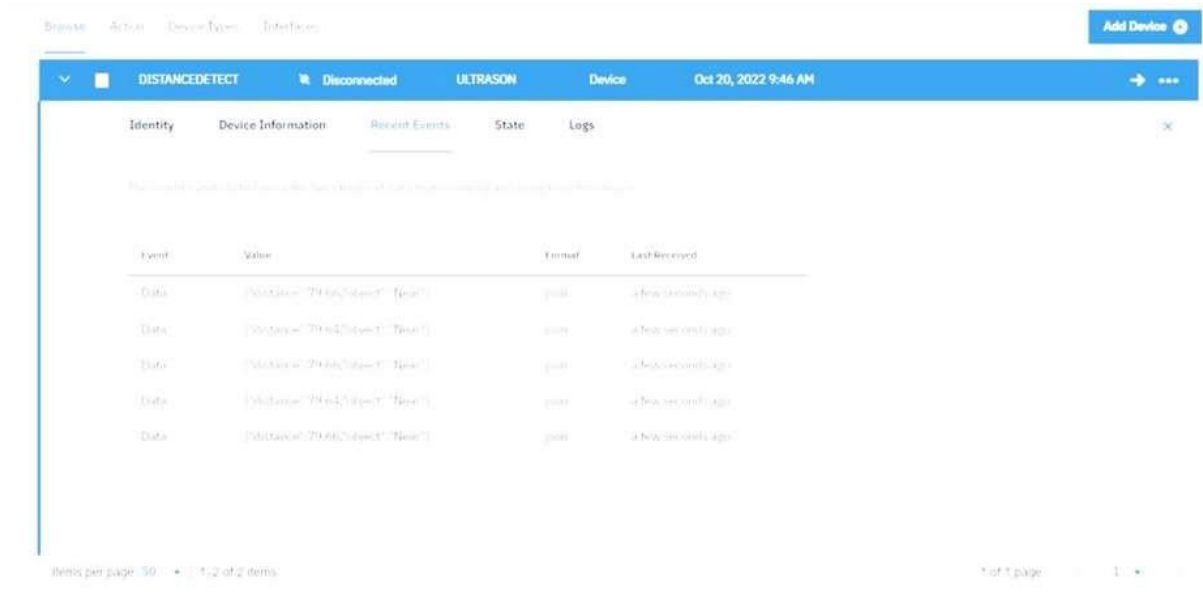
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OUTPUT:
DATA IS SENT TO IBM CLOUD WHEN NO OBJECT IS DETECTED

DISTANCEDETECT				
Disconnected				
ULTRASON				
Device				
Oct 20, 2022 9:46 AM				
Identity	Device Information	Recent Events	State	Logs
No events found. Add Events. No new events found. No new events found. No new events found.				
Event	Value	Format	Last Received	
Data	[{"distance": 79.46, "object": "Near"}]	json	a few seconds ago	
Data	[{"distance": 79.46, "object": "Near"}]	json	a few seconds ago	
Data	[{"distance": 79.46, "object": "Near"}]	json	a few seconds ago	
Data	[{"distance": 79.46, "object": "Near"}]	json	a few seconds ago	
Data	[{"distance": 79.46, "object": "Near"}]	json	a few seconds ago	

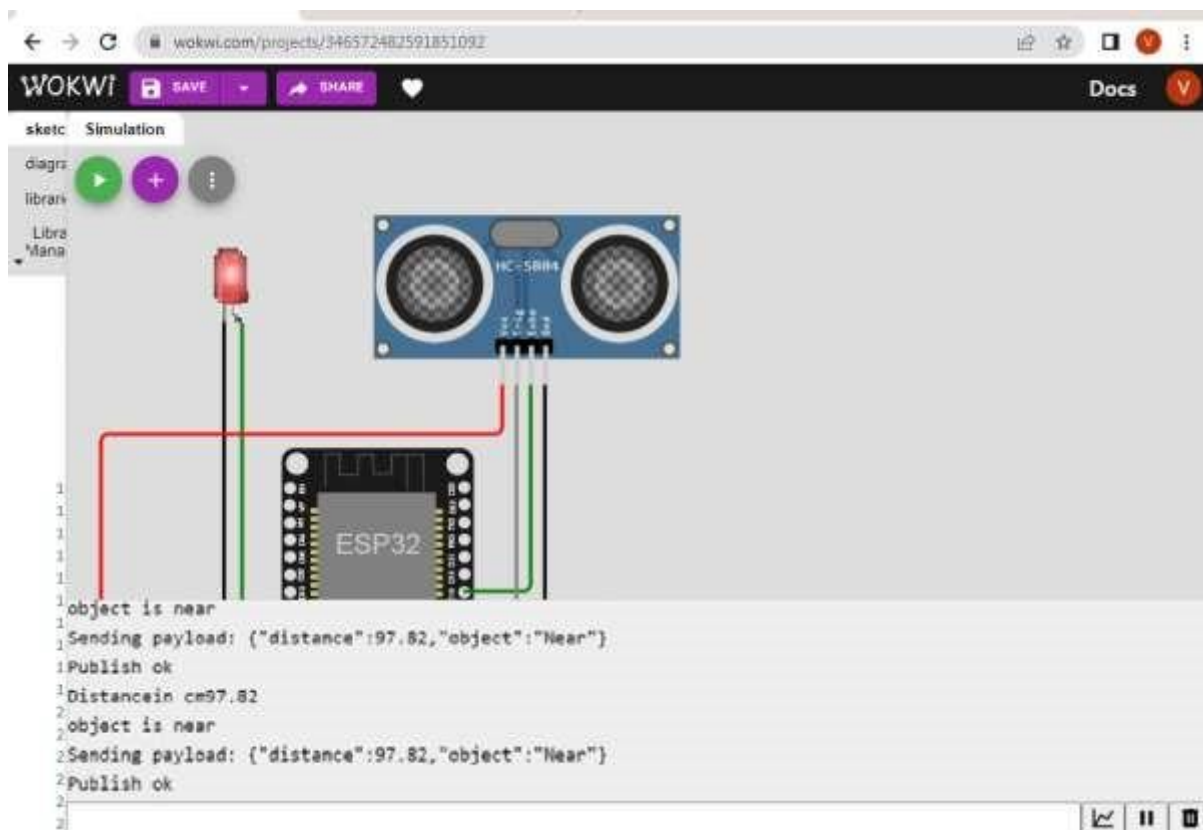
When no object is detected



The screenshot shows the Wokwi web interface for a project named "DISTANCEDETECT". The device is an "ULTRASON" sensor, currently "Disconnected". The interface includes tabs for "Identity", "Device Information", "Recent Events", "State", and "Logs". The "Recent Events" tab is active, displaying a table of events. The table has columns for "Event", "Value", "Format", and "Last Received". There are five events listed, all with the value "[Distance: 79.66/object: 'Near']" and the format "json". The "Last Received" column shows times like "a few seconds ago". At the bottom, it indicates "Items per page: 50" and "1 of 2 items".

Event	Value	Format	Last Received
Data	[Distance: 79.66/object: 'Near']	json	a few seconds ago
Data	[Distance: 79.66/object: 'Near']	json	a few seconds ago
Data	[Distance: 79.66/object: 'Near']	json	a few seconds ago
Data	[Distance: 79.66/object: 'Near']	json	a few seconds ago
Data	[Distance: 79.66/object: 'Near']	json	a few seconds ago

When object is detected in ultrasonic detector



The screenshot shows the Wokwi web interface for a project named "DISTANCEDETECT". The device is an "ULTRASON" sensor, currently "Connected". The interface includes tabs for "Identity", "Device Information", "Recent Events", "State", and "Logs". The "Recent Events" tab is active, displaying a table of events. The table has columns for "Event", "Value", "Format", and "Last Received". There are five events listed, all with the value "[Distance: 97.82/object: 'Near']" and the format "json". The "Last Received" column shows times like "a few seconds ago". At the bottom, it indicates "Items per page: 50" and "1 of 2 items".

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