ASSIGNMENT – 04

DATE	17 OCTOBER 2022
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MAXIMUM MARKS	2 MARKS

QUESTION:

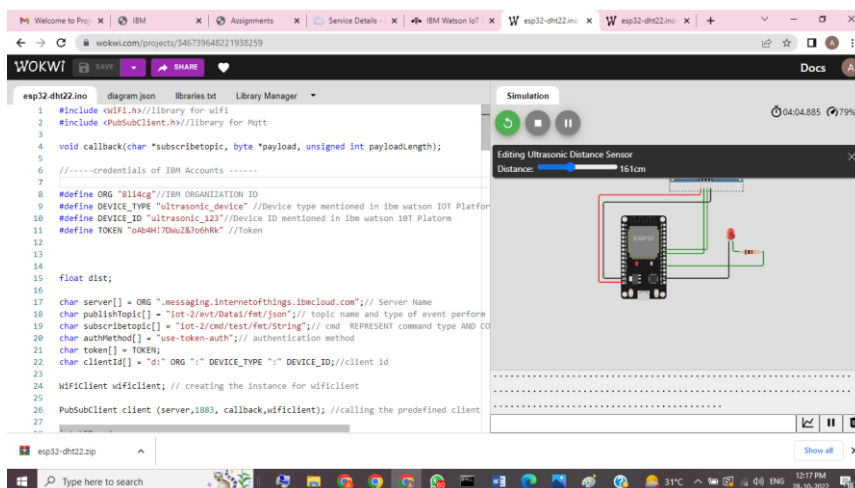Write code and connections in wokwi for the ultrasonic sensor.

Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events.
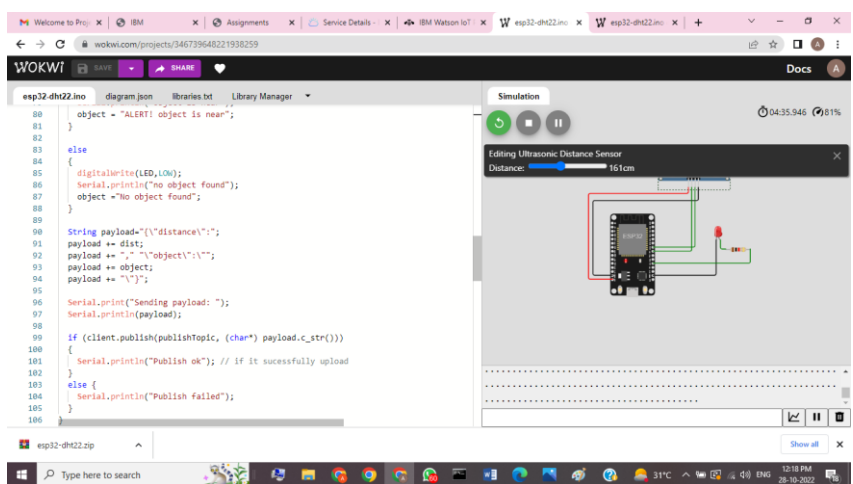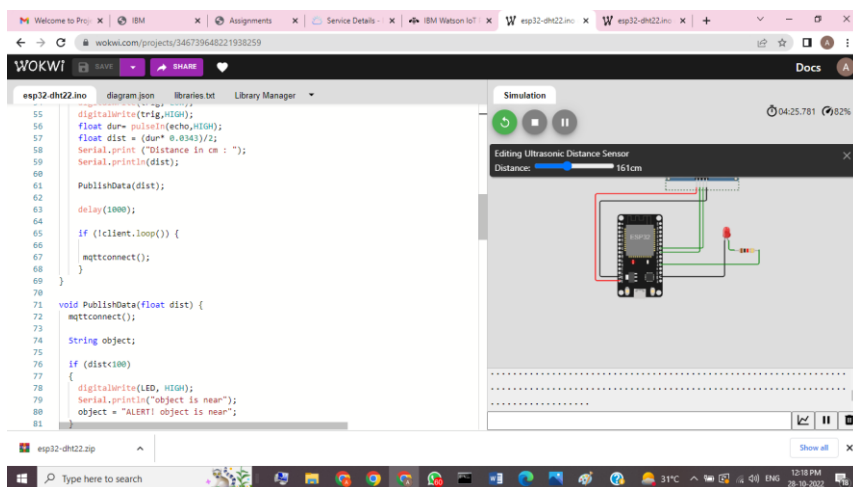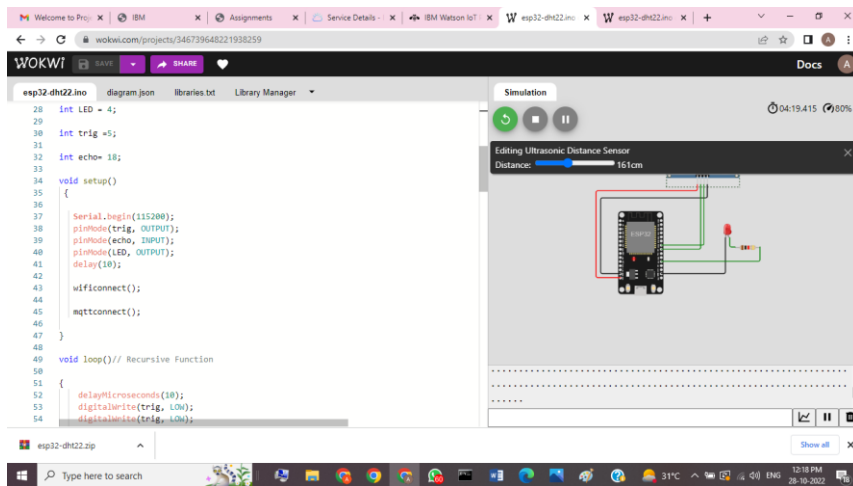
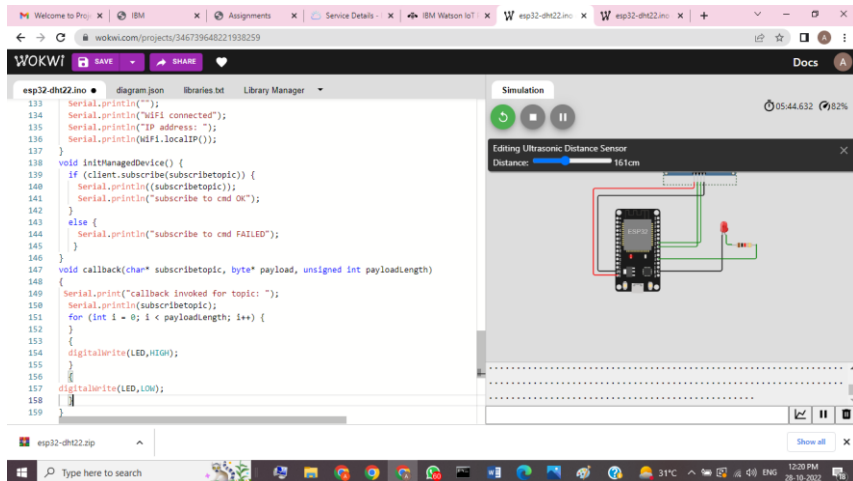Upload document with wokwi share link and images of IBM cloud

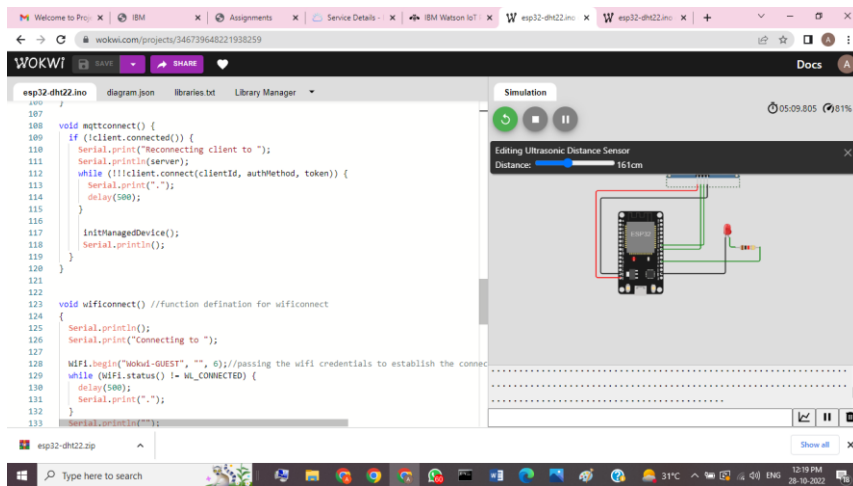**WOKWI CODE AND IMPLEMENTATION LINK:**

https://wokwi.com/projects/346739648221938259

CODE :

```
28  int LED = 4;
29
30  int trig =5;
31
32  int echo= 18;
33
34  void setup()
35  {
36
37    Serial.begin(115200);
38    pinMode(trig, OUTPUT);
39    pinMode(echo, INPUT);
40    pinMode(LED, OUTPUT);
41    delay(10);
42
43    wificonnect();
44
45    mqttconnect();
46
47  }
48
49  void loop()// Recursive Function
50
51  {
52    delayMicroseconds(10);
53    digitalWrite(trig, LOW);
54    digitalWrite(trig, LOW);
```

```
55    digitalWrite(trig,HIGH);
56    float dur= pulseIn(echo,HIGH);
57    float dist = (dur* 0.0343)/2;
58    Serial.print ("Distance in cm : ");
59    Serial.println(dist);
60
61    PublishData(dist);
62
63    delay(1000);
64
65    if (!client.loop()) {
66
67      mqttconnect();
68    }
69  }
70
71  void PublishData(float dist) {
72    mqttconnect();
73
74    String object;
75
76    if (dist<100)
77    {
78      digitalWrite(LED, HIGH);
79      Serial.println("object is near");
80      object = "ALERT! object is near";
81
```

```
80      object = "ALERT! object is near";
81    }
82
83    else
84    {
85      digitalWrite(LED,LOW);
86      Serial.println("no object found");
87      object ="No object found";
88    }
89
90    String payload="{\"distance\":";
91    payload += dist;
92    payload += "," "\"object\":\"";
93    payload += object;
94    payload += "\"}";
95
96    Serial.print("Sending payload: ");
97    Serial.println(payload);
98
99    if (client.publish(publishTopic, (char*) payload.c_str()))
100   {
101     Serial.println("Publish ok"); // if it sucessfully upload
102   }
103   else {
104     Serial.println("Publish failed");
105   }
106
```

```
107
108  void mqttconnect() {
109    if (!client.connected()) {
110      Serial.print("Reconnecting client to ");
111      Serial.println(server);
112      while (!!!client.connect(clientId, authMethod, token)) {
113        Serial.print(".");
114        delay(500);
115      }
116
117      initManagedDevice();
118      Serial.println();
119    }
120  }
121
122
123  void wificonnect() //function defination for wificonnect
124  {
125    Serial.println();
126    Serial.print("Connecting to ");
127
128    WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to establish the connec
129    while (WiFi.status() != WL_CONNECTED) {
130      delay(500);
131      Serial.print(".");
132    }
133    Serial.println("");
```

Editing Ultrasonic Distance Sensor
Distance: 161cm

```
133    Serial.println("");
134    Serial.println("WiFi connected");
135    Serial.println("IP address: ");
136    Serial.println(WiFi.localIP());
137  }
138  void initManagedDevice() {
139    if (client.subscribe(subscribetopic)) {
140      Serial.println((subscribetopic));
141      Serial.println("subscribe to cmd OK");
142    }
143    else {
144      Serial.println("subscribe to cmd FAILED");
145    }
146  }
147  void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
148  {
149    Serial.print("callback invoked for topic: ");
150    Serial.println(subscribetopic);
151    for (int i = 0; i < payloadLength; i++) {
152    }
153    {
154    digitalWrite(LED,HIGH);
155    }
156    {
157  digitalWrite(LED,LOW);
158  }}
159  }
```

Editing Ultrasonic Distance Sensor
Distance: 161cm

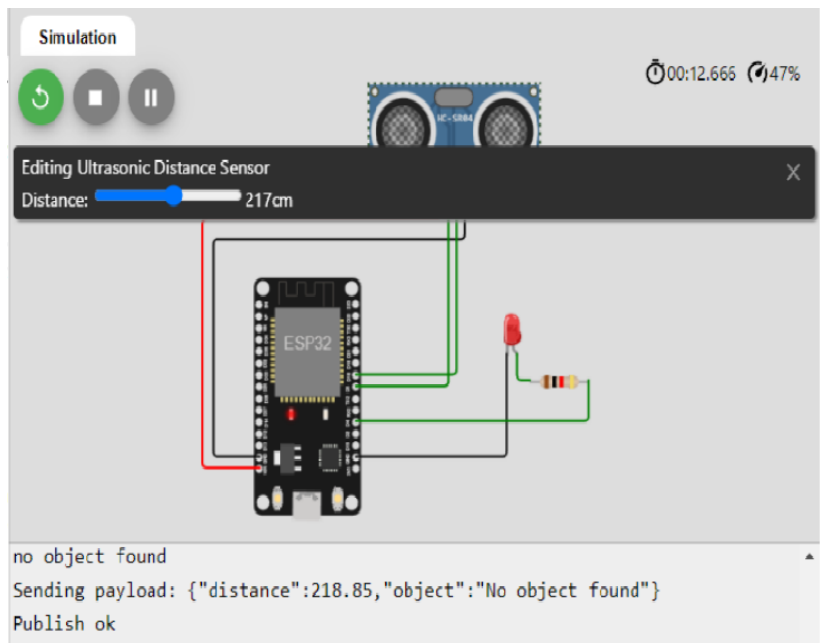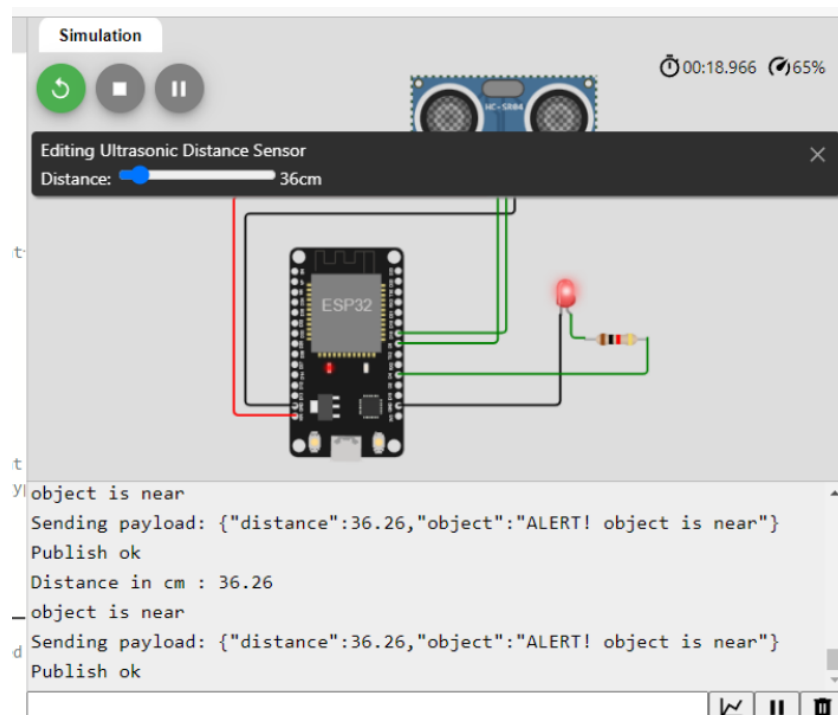## OUTPUT :

When the object is far (greater than 100 cms), send "no object found" to the IBM Watson IOT Platform.

IBM CLOUD IMAGE :

When the distance is less than 100 cms, send an "alert" message to IBM Watson IOT Platform


```
object is near
Sending payload: {"distance":36.26,"object":"ALERT! object is near"}
Publish ok
Distance in cm : 36.26
object is near
Sending payload: {"distance":36.26,"object":"ALERT! object is near"}
Publish ok
```

IBM CLOUD IMAGE :

Connection Information

Recent Events

State

Device Information

Metadata

Diagnostics

Connection Logs

Device Actions

Recent Events

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Data1	{"distance":36.31,"object":"ALERT! object is near"}	json	a few seconds ago
Data1	{"distance":36.31,"object":"ALERT! object is near"}	json	a few seconds ago
Data1	{"distance":36.26,"object":"ALERT! object is near"}	json	a few seconds ago
Data1	{"distance":36.26,"object":"ALERT! object is near"}	json	a few seconds ago
Data1	{"distance":36.26,"object":"ALERT! object is near"}	json	a few seconds ago