Assignment -4

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Maximum mark	2mark

Question-1:

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

CODE :

```
#include <WiFi.h>
#include <PubSubClient.h> void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);

#define ORG "  j3bgcj"
#define DEVICE_TYPE "esp32" #define
DEVICE_ID "1234"
#define TOKEN "12345678" String data3; char server[] = ORG
".messaging.internetofthings.ibmcloud.com";   char publishTopic[] =
"iot-2/evt/Data/fmt/json"; char subscribetopic[]
= "iot-2/cmd/test/fmt/String"; char authMethod[] = "use-token-  auth";
char token[] = TOKEN; char clientId[] = "d:" ORG ":"
DEVICE_TYPE ":" DEVICE_ID;
WiFiClient wifiClient;
PubSubClient client(server, 1883, callback ,wifiClient); const int
trigPin = 5; const int echoPin = 18; #define SOUND_SPEED
0.034 long duration; float distance; void setup() {
Serial.begin(115200); pinMode(trigPin, OUTPUT);
pinMode(echoPin, INPUT); wificonnect(); mqttconnect();
} void loop() { digitalWrite(trigPin,
LOW);        delayMicroseconds(2);
digitalWrite(trigPin,   HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW); duration  =
pulseIn(echoPin, HIGH); distance
```

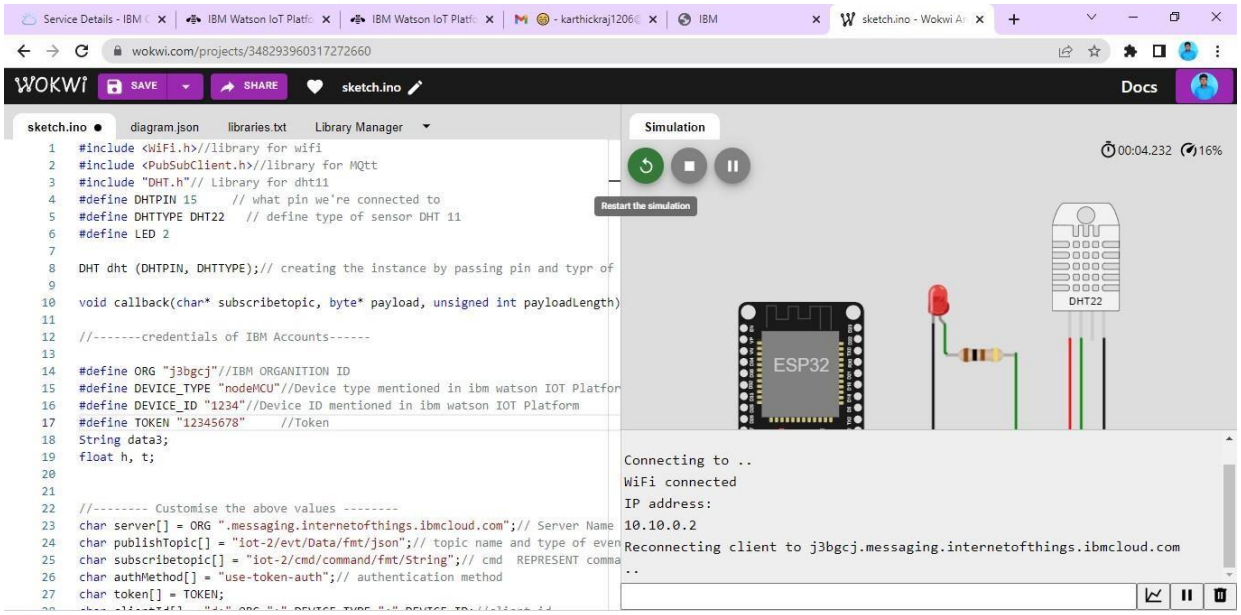
```
= duration * SOUND_SPEED/2; Serial.print("Distance
(cm): "); Serial.println(distance); if(distance<100)
{
Serial.println("ALERT!!");
delay(1000);
PublishData(distance);
delay(1000); if (!client.loop()) {
mqttconnect(); } } delay(1000)
; }
void PublishData(float dist) { mqttconnect(); String payload
= "{\"Distance\":"; payload += dist; payload
+= ",\"ALERT!!\":""\"Distance less than 100cms\""; payload  +=
"}";
Serial.print("Sending payload: ");  Serial.println(payload);

if (client.publish(publishTopic, (char*) payload.c_str())) {
Serial.println("Publish ok");
} else {
Serial.println("Publish failed");
} } void mqttconnect()
{ if
(!client.connected()) {
Serial.print("Reconnecting client to ");
Serial.println(server);  while
(!!!client.connect(clientId, authMethod, token)) {
Serial.print("."); delay(500);
}
initManagedDevice();
Serial.println();
} }
void wificonnect()
{
Serial.println();
Serial.print("Connecting to "); WiFi.begin("Wokwi-GUEST", "", 6); while (WiFi.status() !=
WL_CONNECTED) { delay(500); Serial.print(".");
}
Serial.println(""); Serial.println("WiFi connected"); Serial.println("IP
address:
"); Serial.println(WiFi.localIP());
}
void initManagedDevice() {  if (client.subscribe(subscribetopic)) {
Serial.println((subscribetopic)); Serial.println("subscribe to
cmd OK");
} else {
Serial.println("subscribe to cmd FAILED");
} }
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength) {
Serial.print("callback invoked for topic: ");
Serial.println(subscribetopic); for (int i = 0; i
< payloadLength; i++)
{
```

```
data3 += (char)payload[i];
}
Serial.println("data: "+ data3); data3="";
}
```

Wokwi Link :

https://wokwi.com/projects/348293960317272660

Output and Simulation :



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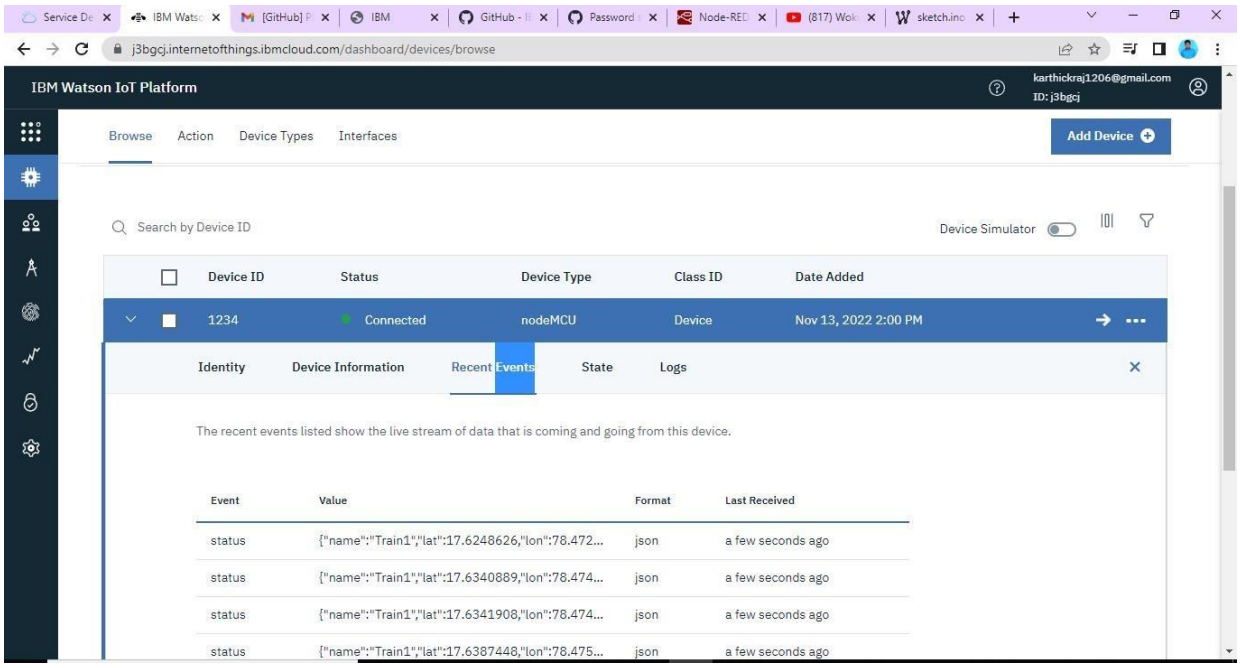
IBM Watson IoT Platform
karthickraj1206@gmail.com
ID: j3bgcj
Browse
Action
Device Types
Interfaces
Add Device
Search by Device ID
Device Simulator
Device ID
Status
Device Type
Class ID
Date Added
1234
Connected
nodeMCU
Device
Nov 13, 2022 2:00 PM
Identity
Device Information
Recent Events
State
Logs
The recent events listed show the live stream of data that is coming and going from this device.
Event
Value
Format
Last Received
status
{"name":"Train1","lat":17.6248626,"lon":78.472...
json
a few seconds ago
status
{"name":"Train1","lat":17.6340889,"lon":78.474...
json
a few seconds ago
status
{"name":"Train1","lat":17.6341908,"lon":78.474...
json
a few seconds ago
status
{"name":"Train1","lat":17.6387448,"lon":78.475...
json
a few seconds ago