IBM ASSIGNMENT -04

Assignment Date	07 November 2022
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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.

<u>CODE:</u>

```
#include <WiFi.h>
#include <PubSubClient.h> void callback(char*
subscribetopic, byte* payload, unsigned int
payloadLength);
//-------credentials of IBM Accounts------
#define ORG "eokk9e"//IBM ORGANITION ID

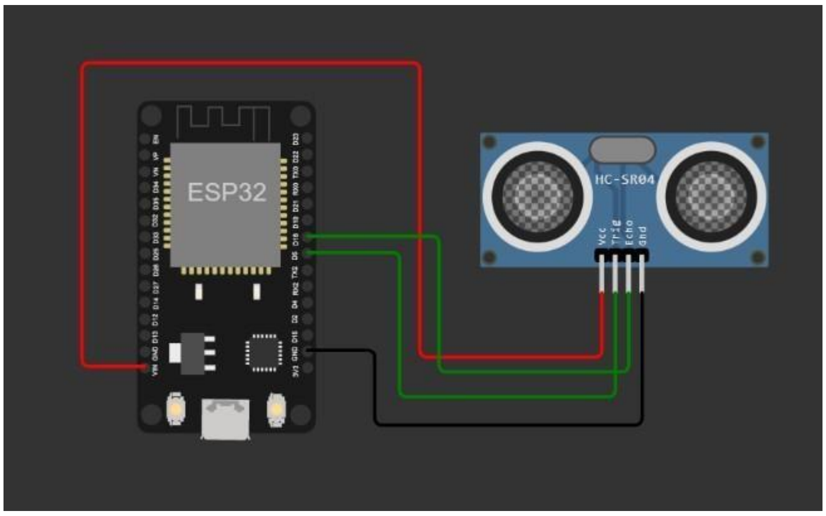
#define DEVICE_TYPE "Chandhnidevice"//Device type mentioned in ibm watson
IOT Platform

#define DEVICE_ID "2804"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "Chandhni82" //Token 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();
```

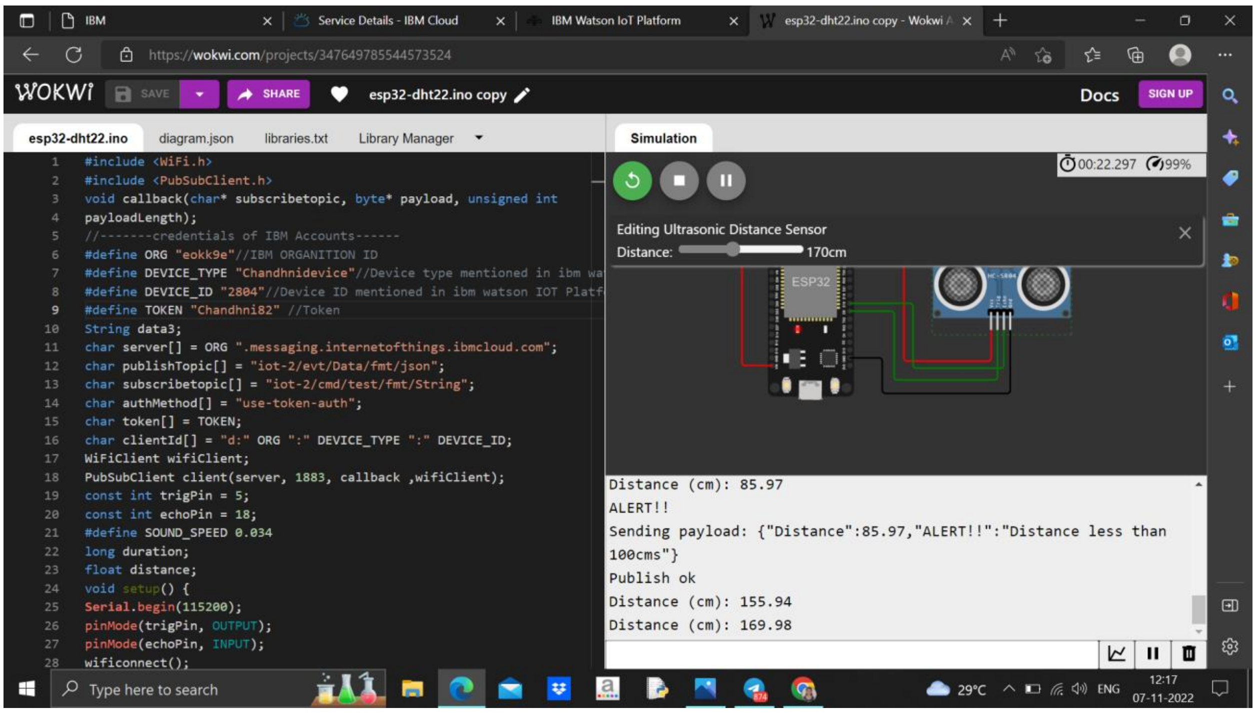
```
}
void loop()
{ digitalWrite(trigPin, LOW);
delayMicroseconds(2);
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW); duration
= pulseIn(echoPin, HIGH); distance =
duration * SOUND_SPEED/2;
Serial.print("Distance (cm): ");
Serial.println(distance); if(distance<100)
{
Serial.println("ALERT!!"); 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++) {
//Serial.print((char)payload[i]);
data3 += (char)payload[i];
}
Serial.println("data: "+ data3);
data3="";
}
```

Schematic Diagram:



WOKWI OUTPUT:



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char authMethod[] = "use-token-auth";
char token[] = TOKEN;
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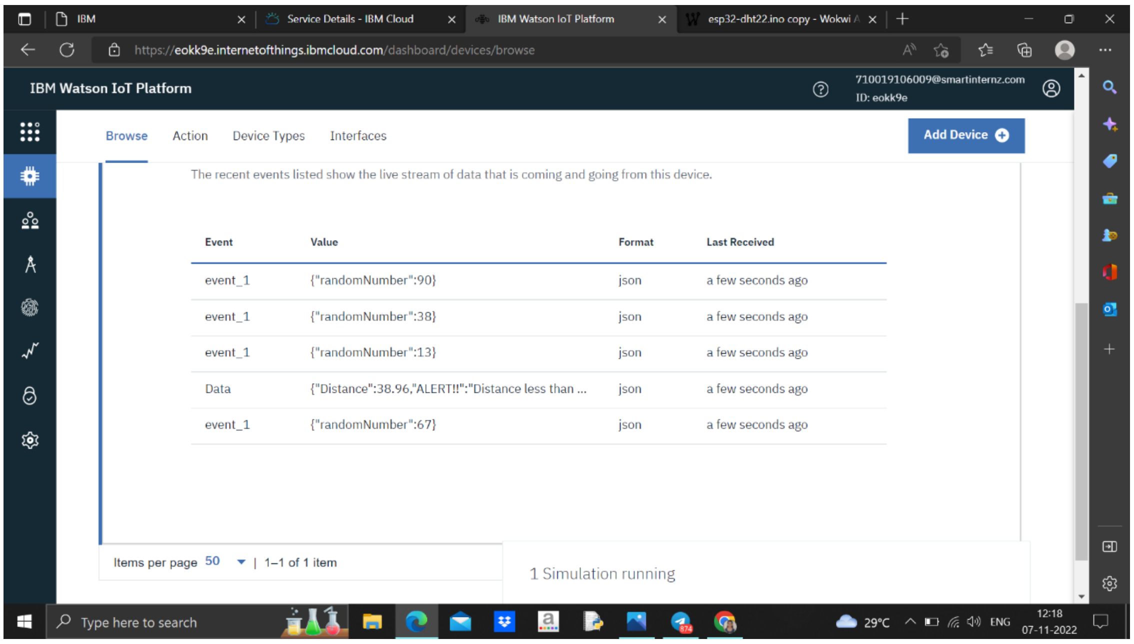
WiFiClient wifiClient;
PubSubClient client(server, 1883, callback ,wifiClient);
const int trigPin = 5;
const int echoPin = 18;
#define SOUND_SPEED 0.034
long duration;
float distance;
void setup() {
Serial.begin(115200);
pinMode(trigPin, OUTPUT);
pinMode(echoPin, INPUT);
wificonnect();
```

Editing Ultrasonic Distance Sensor
Distance: 170cm

```
Distance (cm): 85.97
ALERT!!
Sending payload: {"Distance":85.97,"ALERT!!":"Distance less than
100cms"}
Publish ok
Distance (cm): 155.94
Distance (cm): 169.98
```

IBM CLOUD OUTPUT:



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

Event	Value	Format	Last Received
event_1	{"randomNumber":90}	json	a few seconds ago
event_1	{"randomNumber":38}	json	a few seconds ago
event_1	{"randomNumber":13}	json	a few seconds ago
Data	{"Distance":38.96,"ALERT!!":"Distance less than ...	json	a few seconds ago
event_1	{"randomNumber":67}	json	a few seconds ago

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1 Simulation running

WOKWI LINK:

https://wokwi.com/projects/347571375433581140