Assignment - 4

Assignment Date	**17 October 2022**
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Maximum Marks	**2 Marks**

Question-1:

Write code and connections in wokwi for the ultrasonic sensor. Whenever the distanceis 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 1 :

```
#include <WiFi.h>
#include
<PubSubClient.h>
void callback(char* subscribetopic, byte* payload, unsigned
intpayloadLength);
//-------credentials of IBM Accounts------
#define ORG "lf9jq5"//IBM ORGANITION ID
#define DEVICE_TYPE "IOT_GAS_LEAKAGE"//Device type mentioned in ibm
watson IOT Platform#define DEVICE_ID "23082001"//Device ID mentioned in
ibm watson IOT Platform #define TOKEN "1911043abcdefgh" //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
0.034long duration;
float
distanc
e;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("ALE
RT!!"); delay(1000);
PublishData(distanc
e); delay(1000);
if
(!client.loo
p())
{mqttconne
ct();
}
}
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");
}
}
```

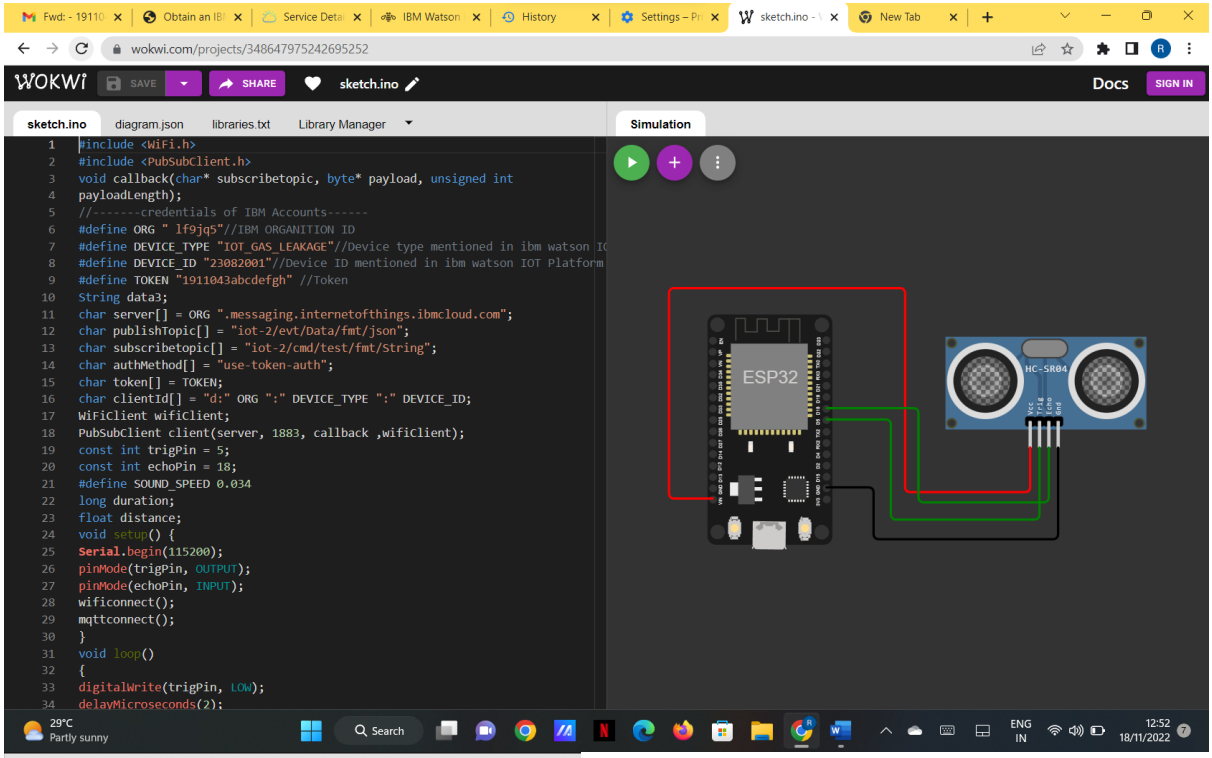
```
void mqttconnect() {
if (!client.connected())
{ Serial.print("Reconnecting client to ");
Serial.println(server);
while (!!!client.connect(clientId, authMethod, token)) {
Serial.print(".");
delay(500);
}
initManagedDevice();
Serial.println();
}
}
void wificonnect()
{
Serial.println();
Serial.print("Connecting 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="";
```

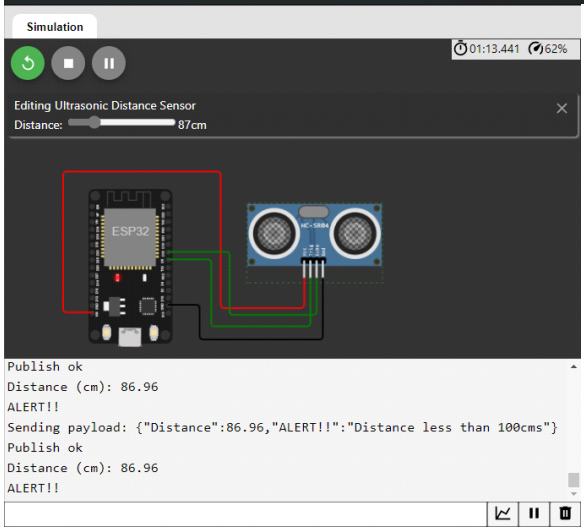
}

Wokwi Link :

https://wokwi.com/projects/347021585567187540

Output and Simulation :





Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display inthe device recent events.

Event	Value	Format	Last Received
Data	{"Distance":93.94,"ALERT!!":"Distance less than ...	json	a few seconds ago
Data	{"Distance":86.99,"ALERT!!":"Distance less than ...	json	a few seconds ago
Data	{"Distance":86.96,"ALERT!!":"Distance less than ...	json	a few seconds ago
Data	{"Distance":86.96,"ALERT!!":"Distance less than ...	json	a few seconds ago
Data	{"Distance":87.01,"ALERT!!":"Distance less than ...	json	a few seconds ago