

ASSIGNMENT 4

QUESTION:

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.

CODE:

```
#include <WiFi.h>
```

```
#include <PubSubClient.h>
```

```
void callback(char*subscribetopic, byte* payload, unsigned int  
payloadLength);
```

```
//-----credentials of IBM Accounts-----
```

```
#define ORG "Ashfaq1824"//IBM ORGANITION ID
```

```
#define DEVICE_TYPE "ESP32"//Device type mentioned in ibm watson IOT Platform
```

```
#define DEVICE_ID "12345"//Device ID mentioned in ibm watson IOT Platform
```

```
#define TOKEN "12345678" //Token
```

```
String data3;
```

```
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
```

```
charpublishTopic[] = "iot-2/evt/Data/fmt/json";
```

```
charsubscribetopic[] = "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 cmdOK");  
  
  } else {
```

```

Serial
.println("subscribe to cmdFAILED");

}

}

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];

}

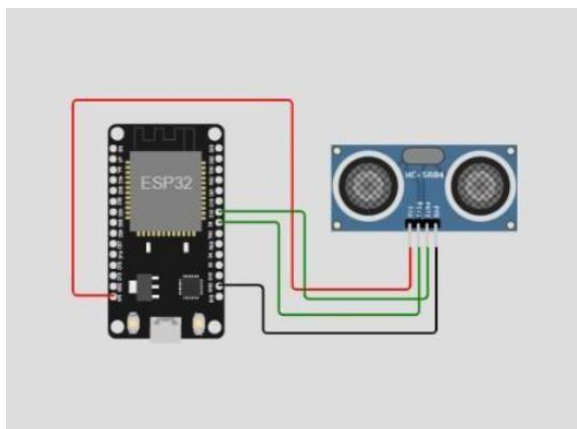
Serial
.println("data: "+ data3);

data3="";

}

```

SCHEMATIC/CIRCUIT DIAGRAM:



IBM CLOUD OUTPUT:

Browse

Action

Device Types

Interfaces

Add Device

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
event_1	{"distance":7,"Alert":"Distance less than 10"}	json	a few seconds ago
event_1	{"distance":9,"Alert":"Distance less than 10"}	json	a few seconds ago
event_1	{"distance":8,"Alert":"Distance less than 10"}	json	a few seconds ago
event_1	{"distance":9,"Alert":"Distance less than 10"}	json	a few seconds ago