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PROGRAM

Smart Waste Management System for Metropolitan Cities

ASSIGNMENT 4:

Write code and connections in wokwi for ultrasonic sensors. Whenever distance is less than 100 cms

send "alert" to ibm cloud and display in device recent events. Upload document with wokwi share link and images of ibm cloud.

CODE:

```
#include <WiFi.h>

#include <PubSubClient.h>

WiFiClient wifiClient;

String data3;

#define ORG "ztcz45"

#define DEVICE_TYPE "naveen"

#define DEVICE_ID "naveen123"

#define TOKEN "123456789"

#define speed 0.034 #define led 14 char server[] = ORG

".messaging.internetofthings.ibmcloud.com"; char

publishTopic[] = "iot-2/evt/Data/fmt/json"; char topic[] = "iot-

2/cmd/home/fmt/String"; char authMethod[] = "use-token-

auth"; char token[] = TOKEN; char clientId[] = "d:" ORG ":"

DEVICE_TYPE ":" DEVICE_ID;

PubSubClient client(server, 1883, wifiClient);
```

```

void publishData();

const int trigpin=5;

const          int
echopin=18;  String
command;    String
data="";      long
duration; float dist;

void setup()
{
  Serial.begin(115200);
  pinMode(led, OUTPUT);
  pinMode(trigpin, OUTPUT);
  ...

```

[10:32 pm, 23/10/2022] Gogul B.E CSE:

```

} void mqttConnect() { if
(!client.connected()) {
  Serial.print("Reconnecting MQTT client to ");
  Serial.println(server); while (!client.connect(clientId,
authMethod, token)) { Serial.print("."); delay(500);
}
  initManagedDevice();
  Serial.println();
}
}

void initManagedDevice() {
if (client.subscribe(topic)) {

```

```

//
Serial.println(client.subscribe(
e(topic));

Serial.println("IBM subscribe to cmd OK");
} else {
Serial.println("subscribe to cmd FAILED");
}
}

void publishData()
{
digitalWrite(trigpin,LOW);
digitalWrite(trigpin,HIGH);
delayMicroseconds(10);
digitalWrite(trigpin,LOW);
duration=pulseIn(echopin,HIGH);
dist=duration*speed/2;
if(dist<100){
String payload = "{\Normal
Distance\":"; payload += dist; payload
+= "}";
Serial.print("\n");
Serial.print("Sending payload: ");
Serial.println(payload); if (client.publish(publishTopic,
(char*) payload.c_str())) {
Serial.println("Publish OK");
}
}

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```

}

if(dist>101 && dist<111){

String payload = "{\Alert distance\":";

payload += dist; payload += "}";

Serial.print("\n");

Serial.print("Sending      payload:      ");

Serial.println(payload); if(client.publish(publishTopic,

(char*) payload.c_str())) {

Serial.println("Warning  crosses  110cm  --  it  automaticaly  of  the  loop");

digitalWrite(led,HIGH);

}else {

Serial.println("Publish 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++){ dist +=

(char)payload[i];

}

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

if(data3=="lighton"){

```

```

Serial.println(data3);

digitalWrite(led,HIGH);

}

data3="";

}

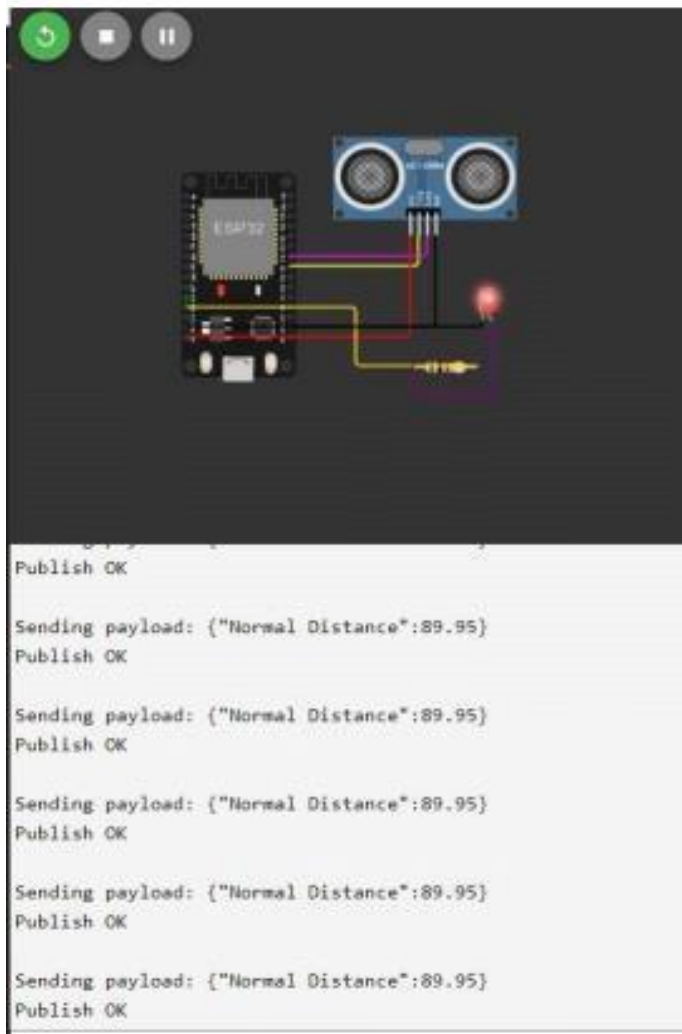
```

output:

The image shows a screenshot of the Wokwi IDE and the TTPM Watson IoT Platform. The Wokwi IDE on the left displays a C++ program for an Arduino Uno connected to an Ultrasonic Distance Sensor. The program sends distance data to the TTPM Watson IoT Platform via MQTT. The TTPM Watson IoT Platform on the right shows the device 'mymote133' in a 'Connected' state. Below the device information, there is a table of recent events.

Event	Value	Format	Last Received
Data	"Alert distance":118.94	json	4 Feb 24:22:00
Data	"Alert distance":118.96	json	4 Feb 24:22:00
Data	"Alert distance":118.96	json	4 Feb 24:22:00
Data	"Alert distance":118.96	json	4 Feb 24:22:00

1. When distance under 100 cm it will show normal distance.



2. When distance cross 100 cm it will show ALERT warning message distance

3. When it cross above 110 cm it today move to iff state once it
reduce to 110 it on again

Connection information:

The image shows two side-by-side screenshots. The left screenshot is from the Wokwi IDE, displaying a C++ code snippet for an Arduino Uno. The code defines a device type 'THOL', sets a device ID 'THOL123', and configures a distance sensor. It includes a loop that sends JSON payloads to a cloud server. The right screenshot is from the IBM Watson IoT Platform, showing the 'Recent Events' tab for a device named 'THOL123'. The table lists several events with a value of '["Alert distance":110.99]'.

```
1 #include <Arduino.h>
2 #include <PubSubClient.h>
3 WiFiClient wifiClient;
4 String data;
5 #define DMS "dms01"
6 #define DEVICE_TYPE "THOL"
7 #define DEVICE_ID "THOL123"
8 #define TMRN "123456789"
9 #define speed 0.014
10 #define led 14
11 char server[] = "org-xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx.messaging.internetofthings.ibmcloud.com";
12 char publicKey[] = "iot-2/evt/data/fmt/json";
13 char topic[] = "iot-2/cmd/xxxxxx/string";
14 char authMethod[] = "use-token-auth";
15 char token[] = TMRN;
16 char clientId[] = "i-1-ORG-1-DEVICE_TYPE-1-DEVICE_ID";
17 PubSubClient client(server, 8883, wifiClient);
18 void publishData();
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```

Basic connection information about this device.

Organization ID : ztc45

Device Type : THOL

Device ID : THOL123

Authentication Method : use-token-auth Authentication Token : 123456789

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	
Data	{"Normal Distance":89.95}	json	a few second	
Data	{"Normal Distance":89.95}	json	a few second	
Data	{"Normal Distance":89.95}	json	a few second	
Data	{"Normal Distance":89.95}	json	a few second	
Data	{"Normal Distance":89.95}	json	a few second	