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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. Uplode 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(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");

}

}

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 Wokwi IDE window on the left and a TTP IoT Platform web interface on the right.

Wokwi IDE: The code editor shows a C++ sketch for an Arduino Uno. The sketch defines a distance sensor (HC-SR04) and a loop that sends distance data to a cloud server. The simulation window shows a virtual Arduino board with the sensor connected. The console output shows the following messages:

```

Sending payload: {"Alert distance":118.96}
Warning crosses 118cm -- It automatically of the loop
Sending payload: {"Alert distance":118.96}
Warning crosses 118cm -- It automatically of the loop
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Warning crosses 118cm -- It automatically of the loop

```

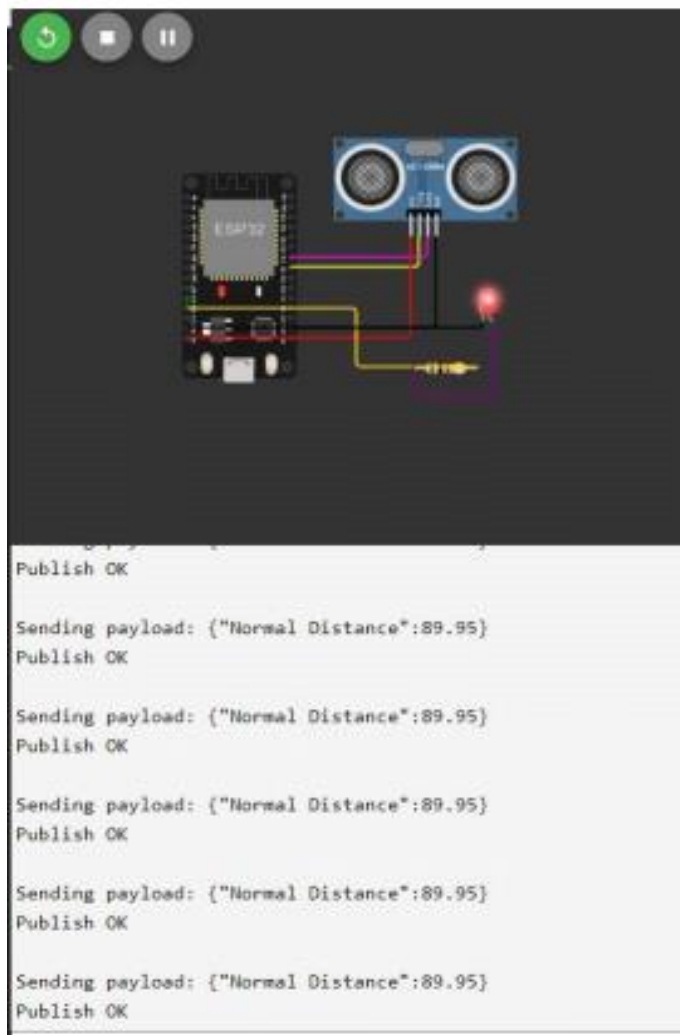
TTP IoT Platform: The web interface shows a list of devices. The table below displays the data received from the device.

Device ID	Status	Device Type
system123	Connected	esp8266

The console shows the following data:

Event	Value	Format	Last Received
Data	{"Alert distance":118.96}	json	a few seconds
Data	{"Alert distance":118.96}	json	a few seconds
Data	{"Alert distance":118.96}	json	a few seconds
Data	{"Alert distance":118.96}	json	a few seconds
Data	{"Alert distance":118.96}	json	a few seconds

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



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

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 uses an Ultrasonic sensor (HC-SR04) to measure distance. It includes comments and code for setting up the sensor, connecting to a Wi-Fi network, and sending data to a cloud platform. A key part of the code is a loop that checks if the distance is less than 100 cm. If it is, it sends a JSON payload: {"Alert distance":110.98}. The right screenshot is from the IBM Watson IoT Platform, showing the 'Recent Events' tab for a device named 'akash123'. It displays a table of events where the 'Value' column contains the JSON payload {"Alert distance":110.98} and the 'Last Received' column shows the time of each event.

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

reduce to 110 it on again

Connection information:

Basic connection information about this device.

Organization ID : ztcz45

Device Type : akash

Device ID : akash123

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	