

SPRINT - 3

Date	19 November 2022
Team ID	PNT2022TMID48693
Project Name	Smart waste management system for metropolitan cities
Points	20

Created a IOT device to sense the level of bins and do code for device and send to Node Red using the API keys from Watson platform

CODE :

```
#include <WiFi.h> #include <PubSubClient.h> void
callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);

#define ORG "fb3a19"           // IBM organisation id
#define DEVICE_TYPE "sample"   // Device type mentioned in ibm watson iot platform
#define DEVICE_ID "123"        // Device ID mentioned in ibm watson iot platform
#define TOKEN "Abcdefgh"       // TokenString
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; float
level;

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; level =
  400 - distance; Serial.print("Distance
  (cm): "); Serial.println(level);
  if(level>300)
  {
    Serial.println("ALERT!!");
    delay(1000);
    PublishData(level);
    delay(1000); if
    (!client.loop()) {
      mqttconnect();
    }
  }
  else
  {
    Publishdata2(level);
    delay(1000); if
    (!client.loop()) {
      mqttconnect();
    }
  }
  delay(1000);
}

```

```

void PublishData(float dist) { mqttconnect(); String payload =
  "{\"Level\": "; payload += dist; payload +=
  ", \"ALERT!!\": \"\" \"Bin Level less than 100 Units \"\""; 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 Publishdata2(float dist) {
  mqttconnect(); String
  payload = "{\"Level\":\"";
  payload += dist; 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");
}
}

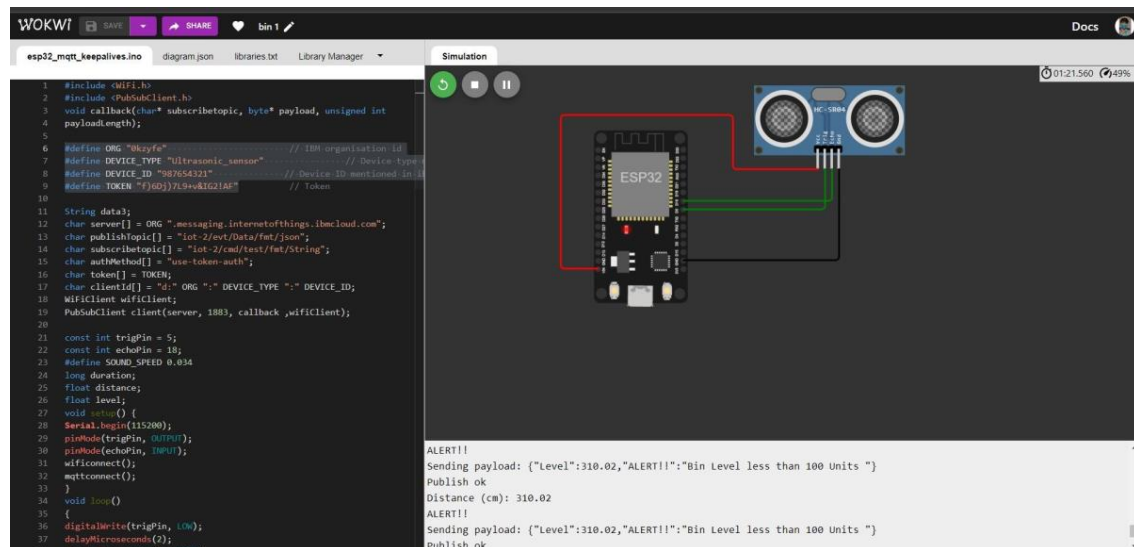
```

```

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="";
}

```

Sensor circuit:



Watson IOT Platform:

IBM Watson IoT Platform

rsangeetrsangeet07@gmail.com
ID: 0kzyle

Browse

Action

Device Types

Interfaces

Add Device

987654321

Connected

Ultrasonic_sensor

Device

Nov 12, 2022 1:48 PM

Identity

Device Information

Recent Events

State

Logs

Device ID

987654321

Device Type

Ultrasonic_sensor

Date Added

Nov 12, 2022 1:48 PM

Added By

rsangeetrsangeet07@gmail.com

Connection Status

Connected

Connection Time: Nov 15, 2022 2:05 PM

Client Address: 106.198.11.75 SecureToken

>

☐

BIN1

Connected

BIN_1

Device

Nov 15, 2022 12:18 PM

>

☐

BIN2

Connected

BIN_2

Device

Nov 15, 2022 12:22 PM

>

☐

BIN3

Connected

BIN_3

Device

Nov 15, 2022 12:24 PM

Items per page 50

1-5 of 5 items

1 of 1 page

<

1

>

IBM Watson IoT Platform

rsangeetrsangeet07@gmail.com
ID: 0kzyle

Browse

Action

Device Types

Interfaces

Add Device

987654321

Connected

Ultrasonic_sensor

Device

Nov 12, 2022 1:48 PM

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

status

{"Level":266,"Alert":"Bin is available"}

json

a few seconds ago

status

{"Level":212,"Alert":"Warning!",Trash is about to ...

json

a few seconds ago

status

{"Level":389,"Alert":"Bin is available"}

json

a few seconds ago

>

☐

BIN1

Connected

BIN_1

Device

Nov 15, 2022 12:18 PM

>

☐

BIN2

Connected

BIN_2

Device

Nov 15, 2022 12:22 PM

>

☐

BIN3

Connected

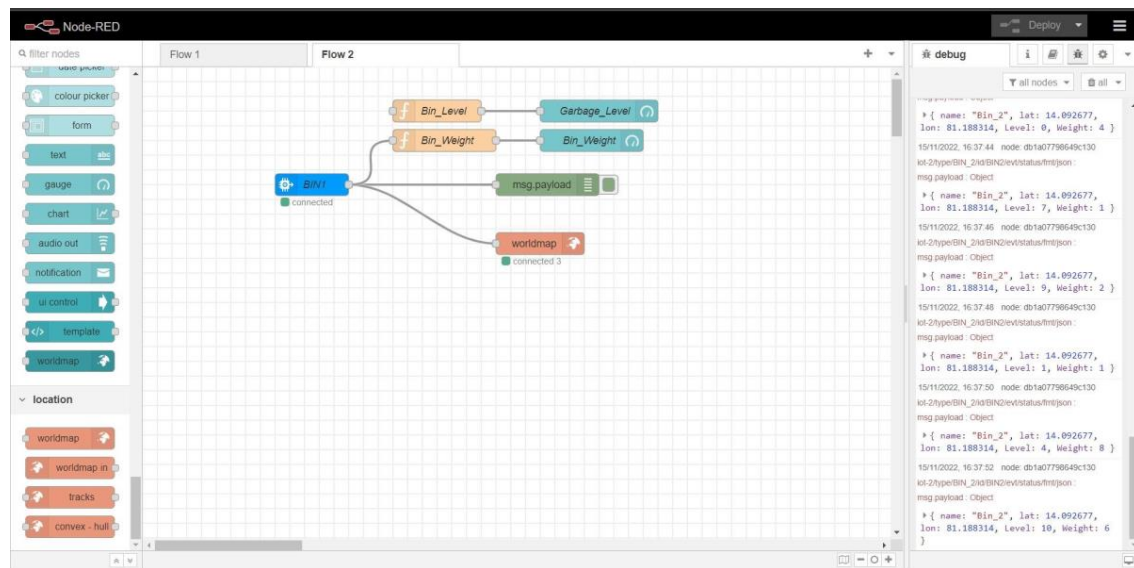
BIN_3

Device

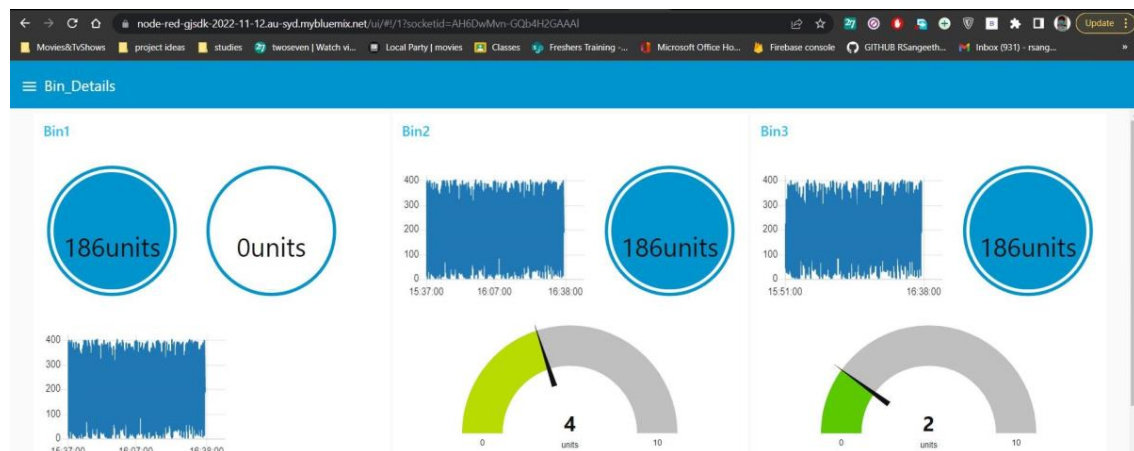
No

0 Simulations running

Node-RED Connections :



Web UI :



Run the code here : <https://wokwi.com/projects/348375948659262034>