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();
}
```

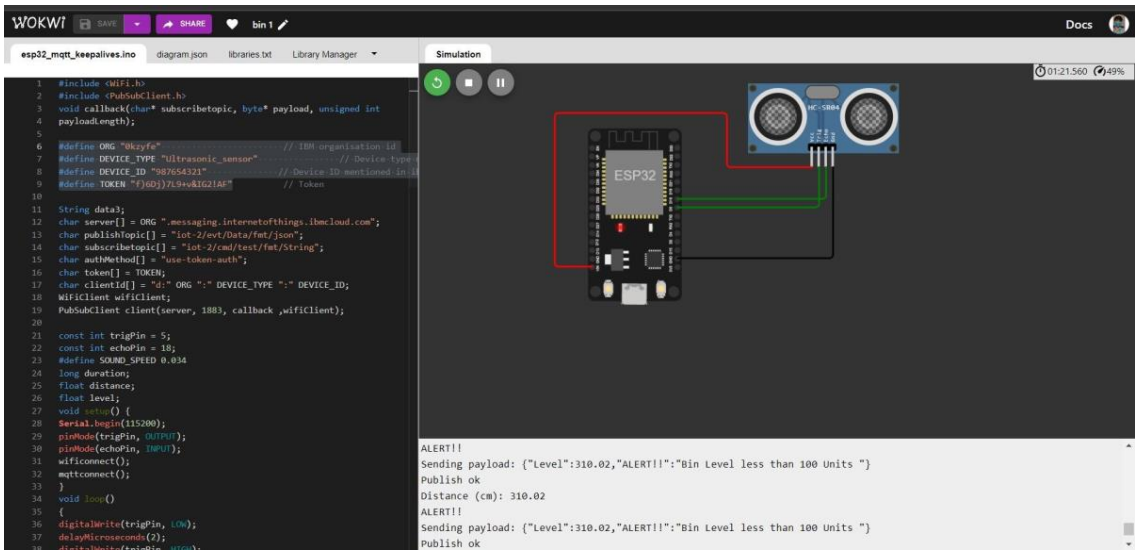
```
void loop()
{
digitalWrite(trigPin, LOW);
delayMicroseconds(2);
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW); duration =
pulseIn(echoPin, HIGH); distance =
duration * SOUND_SPEED/2; level =
400 - distance; Serial.print("Distance
(cm): "); Serial.println(level);
if(level>300)
{
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));
```

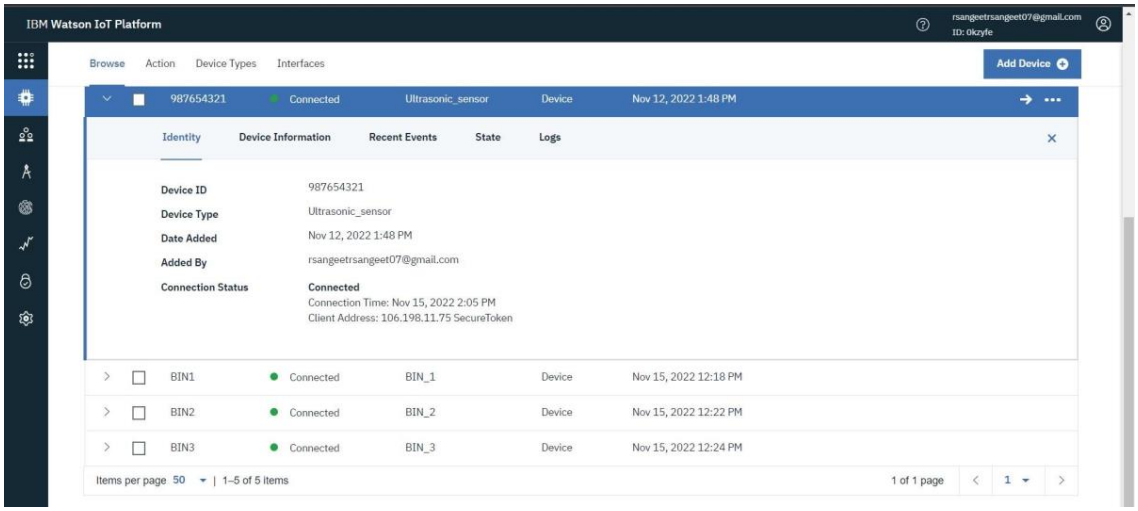
```
Serial.println("subscribe to cmd OK");
} else {
Serial.println("subscribe to cmd FAILED");
}
}
```

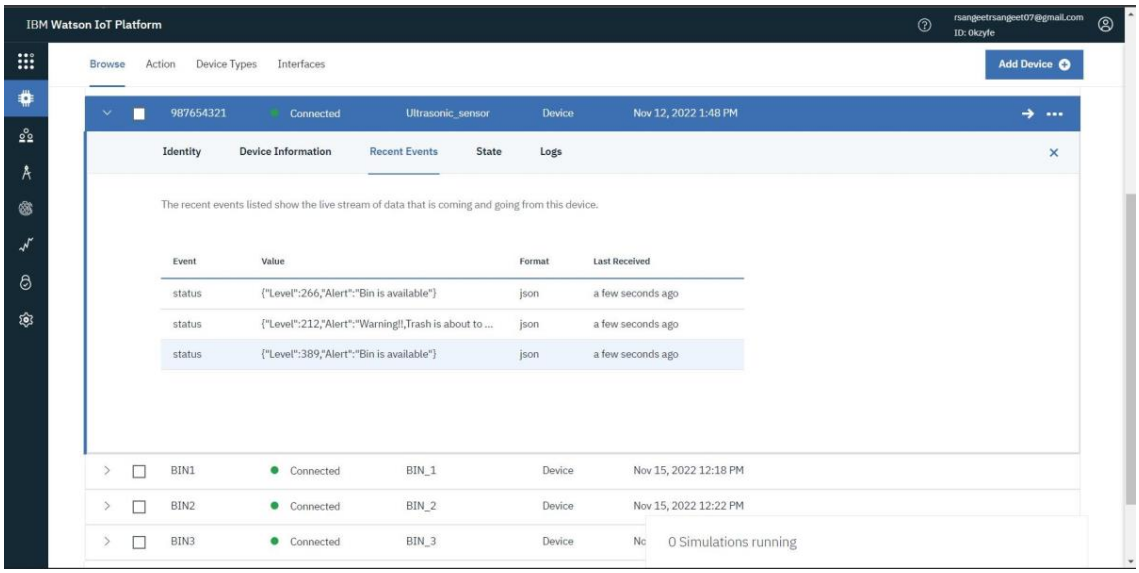
```
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
{
Serial.print("callback invoked for topic: ");
Serial.println(subscribetopic); for (int i =
0; i < payloadLength; i++) {
//Serial.print((char)payload[i]);
data3 += (char)payload[i];
}
Serial.println("data: "+ data3);
data3="";
}
```

Sensor circuit:

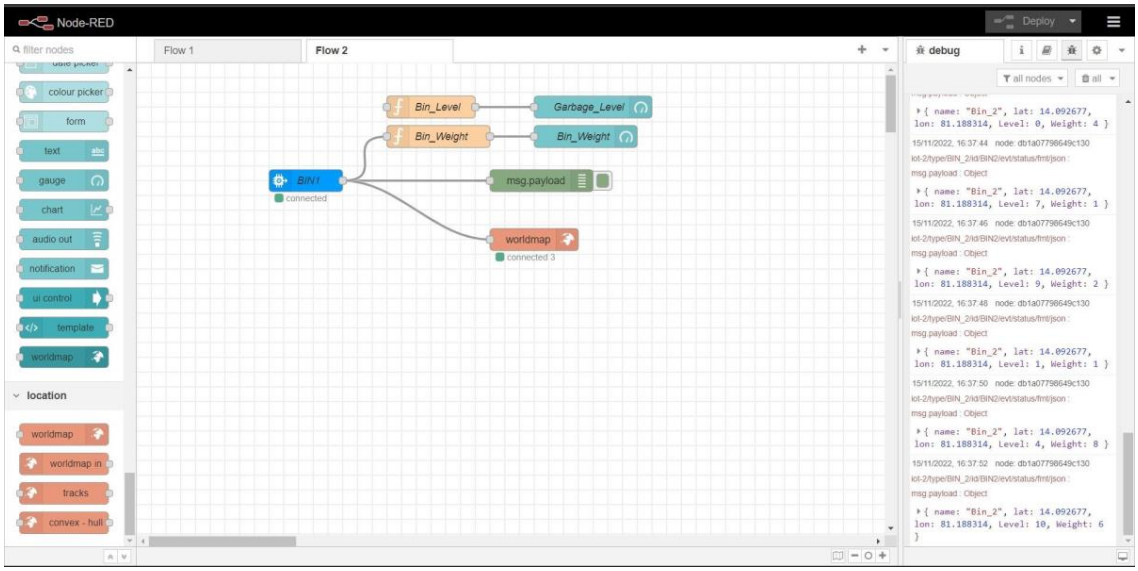


Watson IOT Platform:

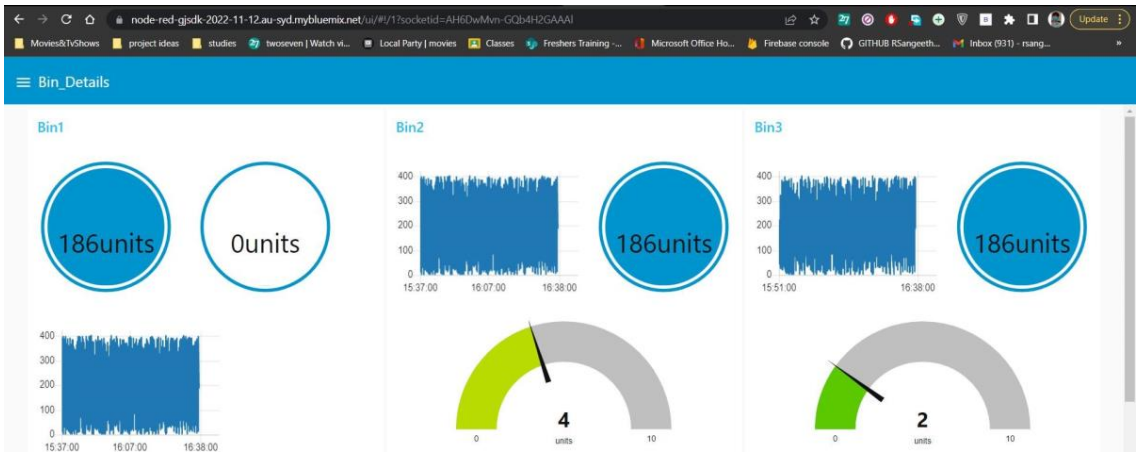




Node-RED Connections :



Web UI :



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