SPRINT - 3

Date	11 November 2022
Team ID	PNT2022TMID21140
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 :

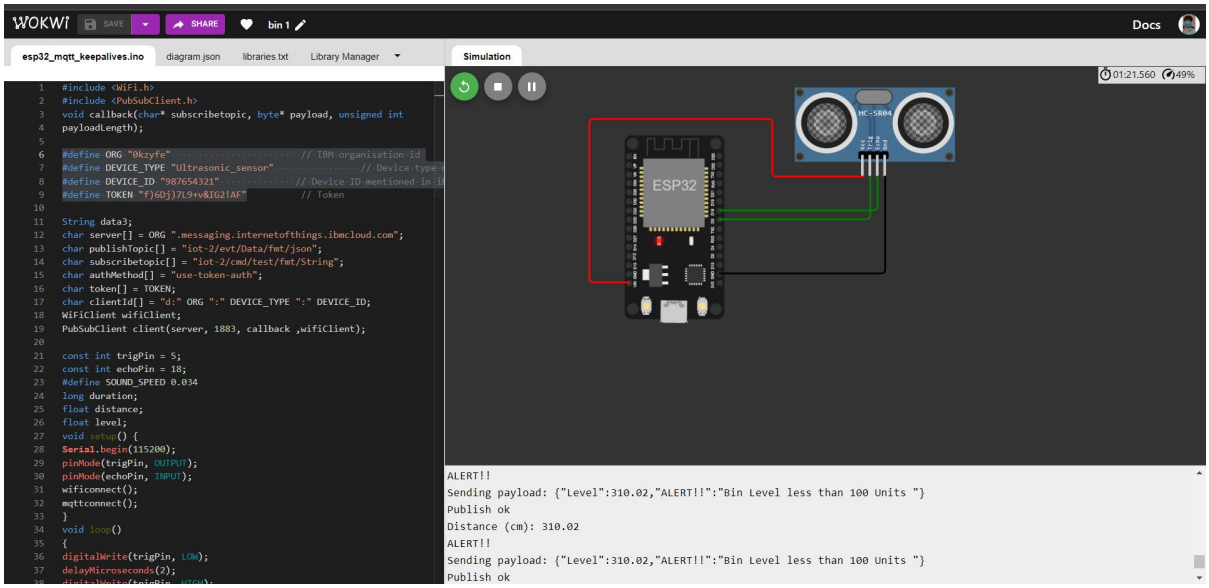
```
#include <WiFi.h>
#include <PubSubClient.h>
void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);


#define ORG "0kzyfe"                  // IBM organisation id
#define DEVICE_TYPE "final"             // Device type mentioned in ibm watson iot platform
#define DEVICE_ID "1234"            // Device ID mentioned in ibm watson iot platform
#define TOKEN "&sVA*)3VSDPzwM6!Jx"        // 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");
```

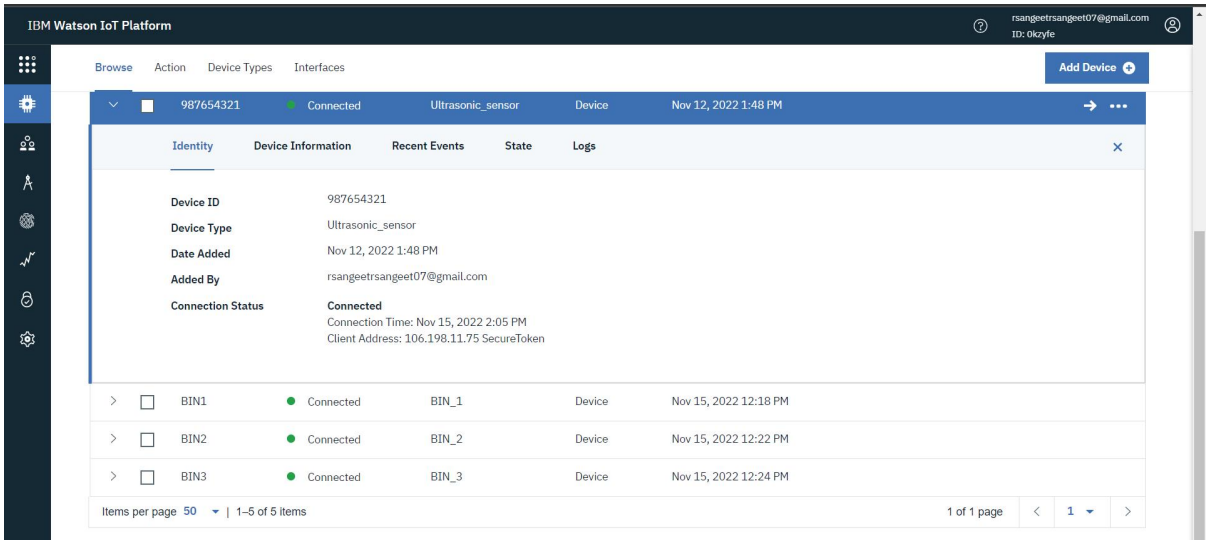
```
} else {
Serial.println("Publish failed");
}
}


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: ");
```

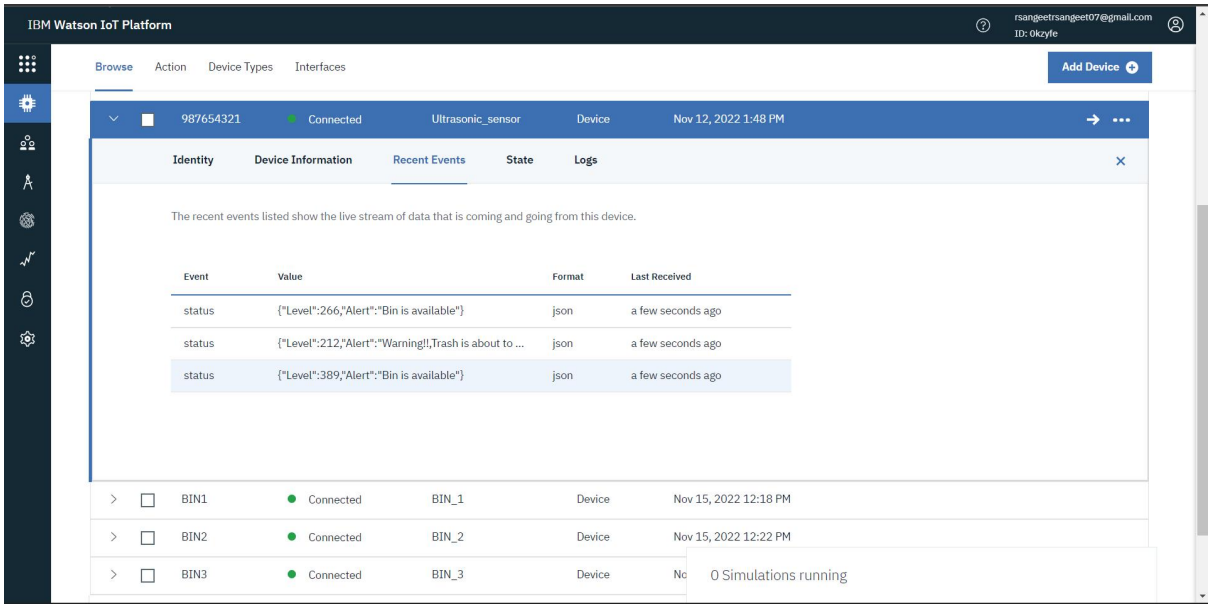
```
Serial.println(WiFi.localIP());
}


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:

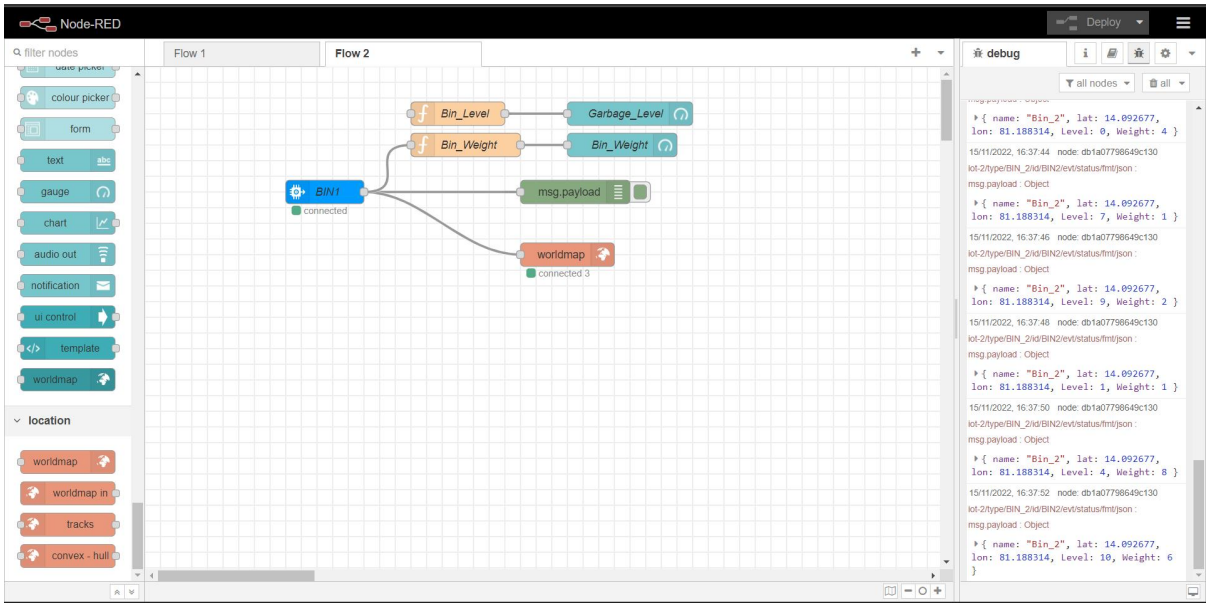


Watson IOT Platform:

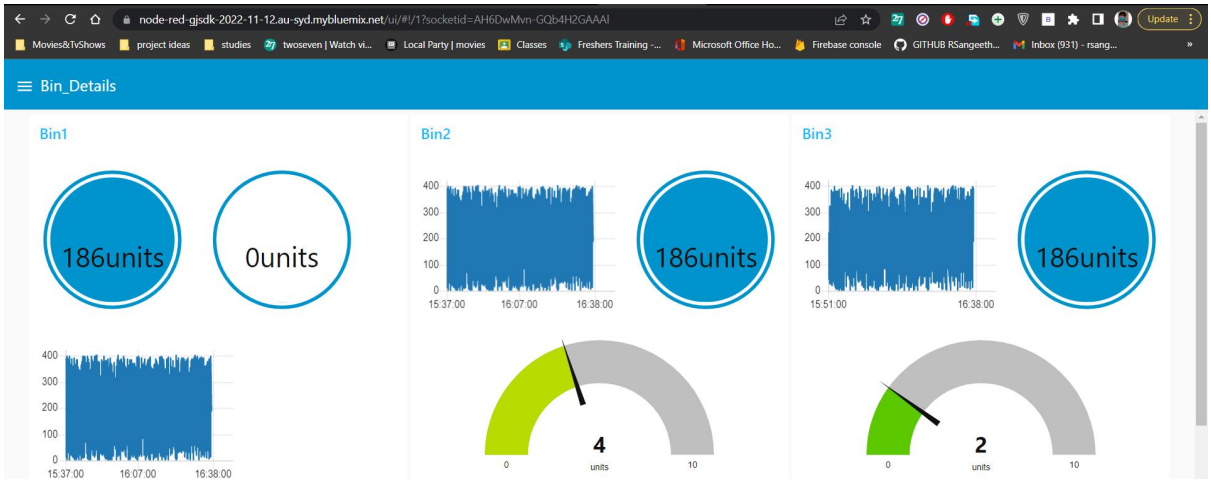




Node-RED Connections :



Web UI :



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