

Project Development phase

SPRINT 3

Date	12 November 2022
Team ID	PNT2022TMID03704
Project Name	Project – Smart Waste Management for Metropolitan cities
Maximum Marks	2 Marks

In this Phase, I will explain about the flow of our project.

- As we mentioned in the Data flow graph, we are first using online simulation tool to send the level of the dustbin with the help of ultrasonic sensor using WOKWI platform and we also send the required data such as location, bin name etc...
- This data is being sent to the IBM Watson IOT platform and with the help of IBM Watson IOT node we can get the data in node red.
- We designed few flows to make the data to be in a required format like maps, tables, gauge.
- Here we store the Admin, Co admin, Truck driver details in the database (Cloudant DB)
- We also store the Timings of the BIN which is being filled for future calculations.
- We have also created a python script to generate random BIN values which can also be used instead of WOKWI to send data to the IBM Watson IOT platform.
- I've also added few Screenshots of the things we have done.
- And In Bin database, we also delete the data from the database when the number of elements is above 11 for making use of the space effectively.
- We used world map node for displaying the latitude and longitude in the Map.

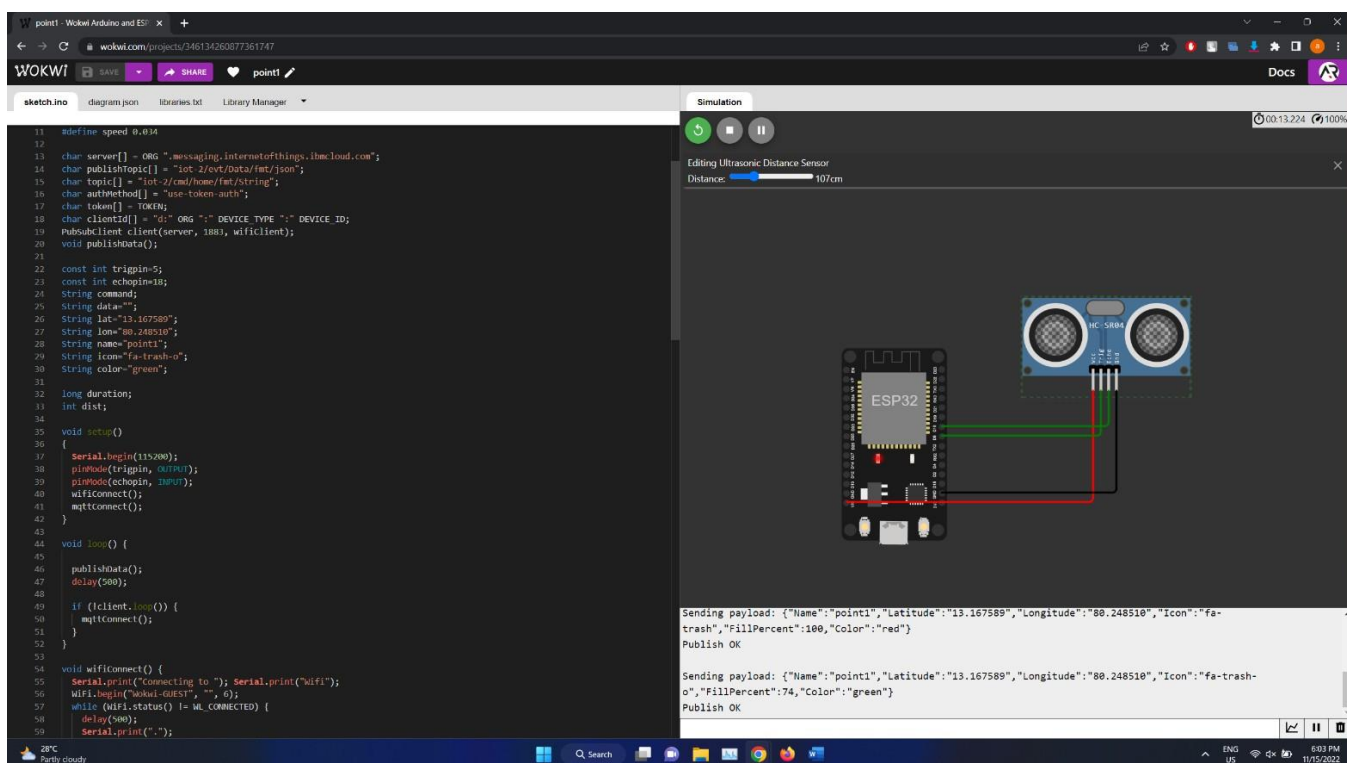
These are the things we have done in our project in Sprint Phase 3

SCREENSHOTS:

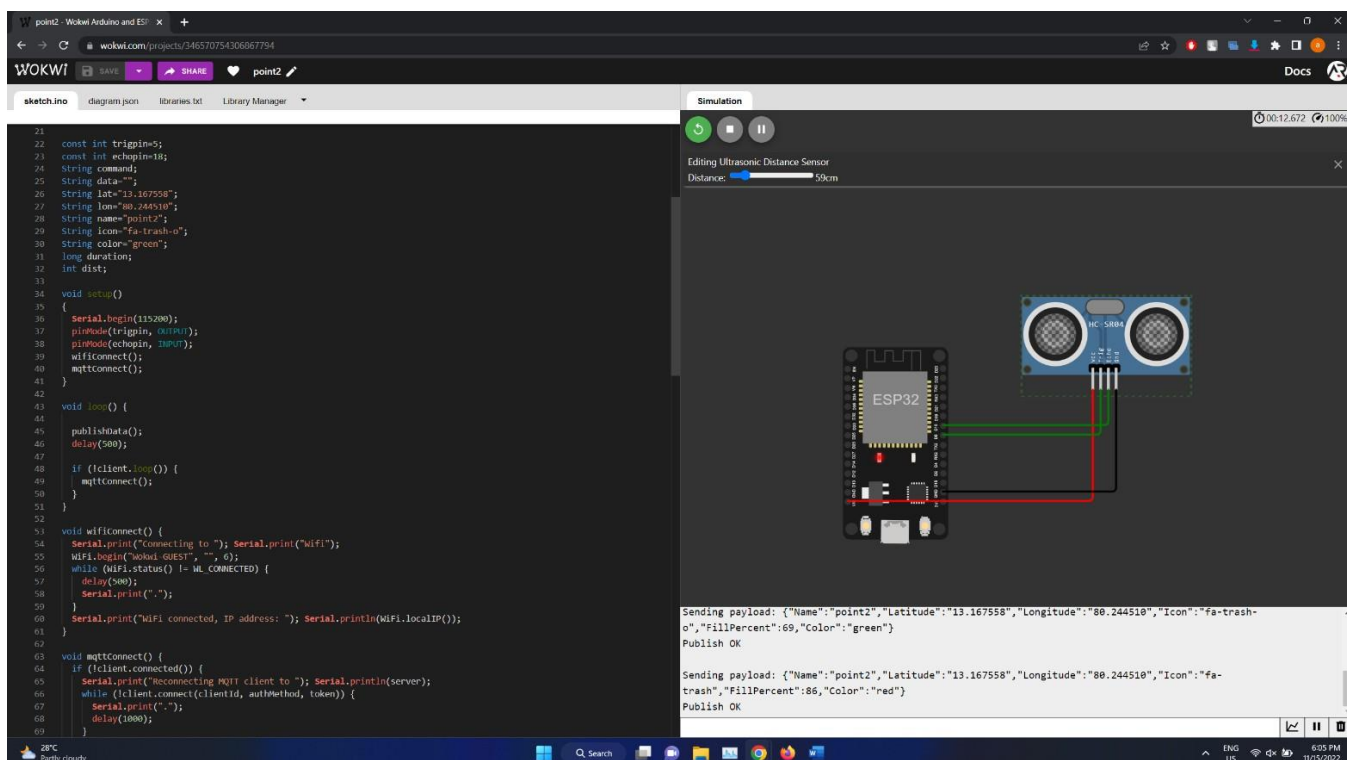
1) WOKWI Platform:

As we move the slider of the ultrasonic sensor. The value of the bin get changed

For **BIN 1**:



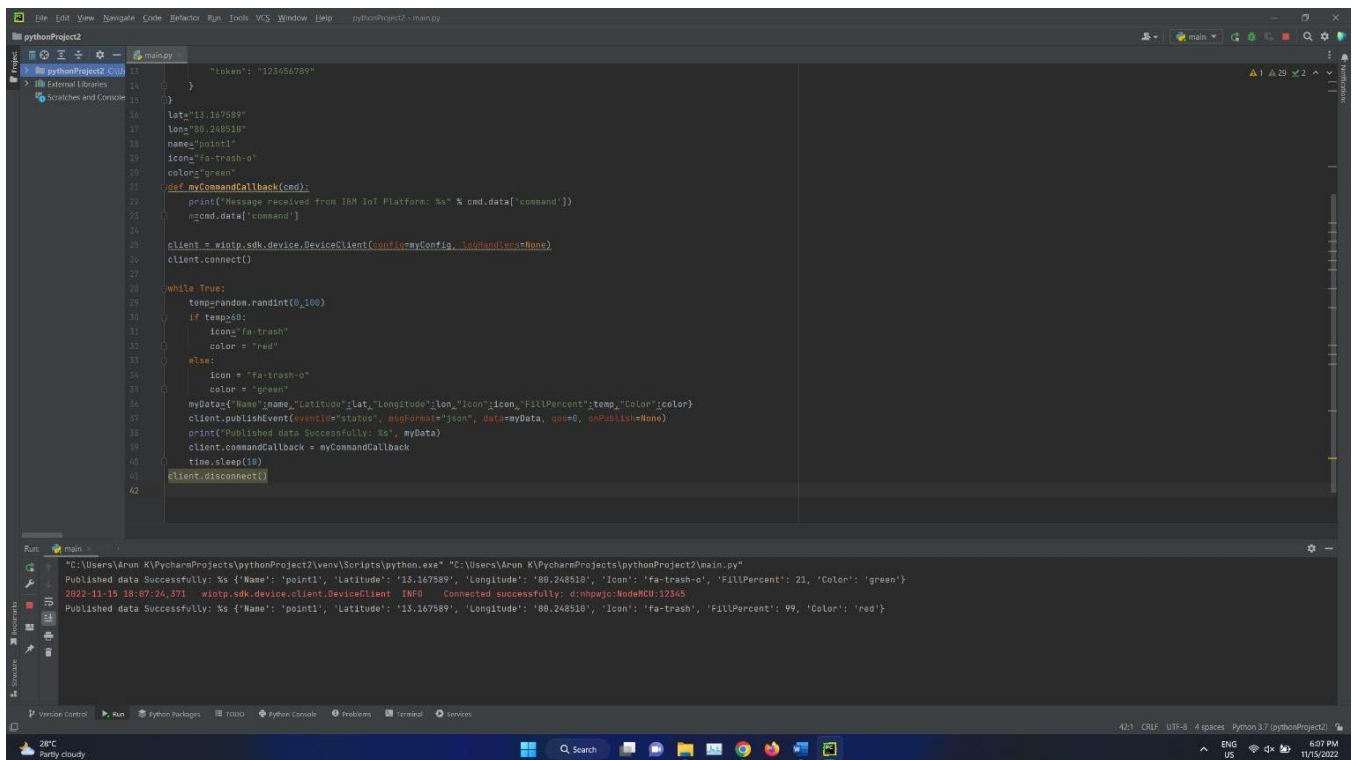
For **BIN 2:**



2) Python Code:

Here we can see the Python Code which is used to connect with IBM Watson IOT platform.

For BIN 1:



```
11 token: "123456789"
12 }
13 }
14
15 lat="13.167589"
16 lon="88.248510"
17 name="point1"
18 icon="fa-trash-o"
19 color="green"
20
21 def myCommandCallback(cmd):
22     print("Message received from IBM IoT Platform: %s" % cmd.data['command'])
23     m=cmd.data['command']
24
25 client = wiotp.sdk.device.DeviceClient(config=myConfig, loghandlers=None)
26 client.connect()
27
28 while True:
29     temp=random.randint(0,100)
30     if temp<50:
31         icon="fa-trash"
32         color = "red"
33     else:
34         icon = "fa-trash-o"
35         color = "green"
36     myData={ "Name":name,"Latitude":lat,"Longitude":lon,"Icon":icon,"FillPercent":temp,"Color":color}
37     client.publishEvent(eventid="status", msgformat="json", data=myData, qos=0, onPublish=None)
38     print("Published data Successfully: %s" % myData)
39     client.commandCallback = myCommandCallback
40     time.sleep(10)
41
42 client.disconnect()
```

Run: main

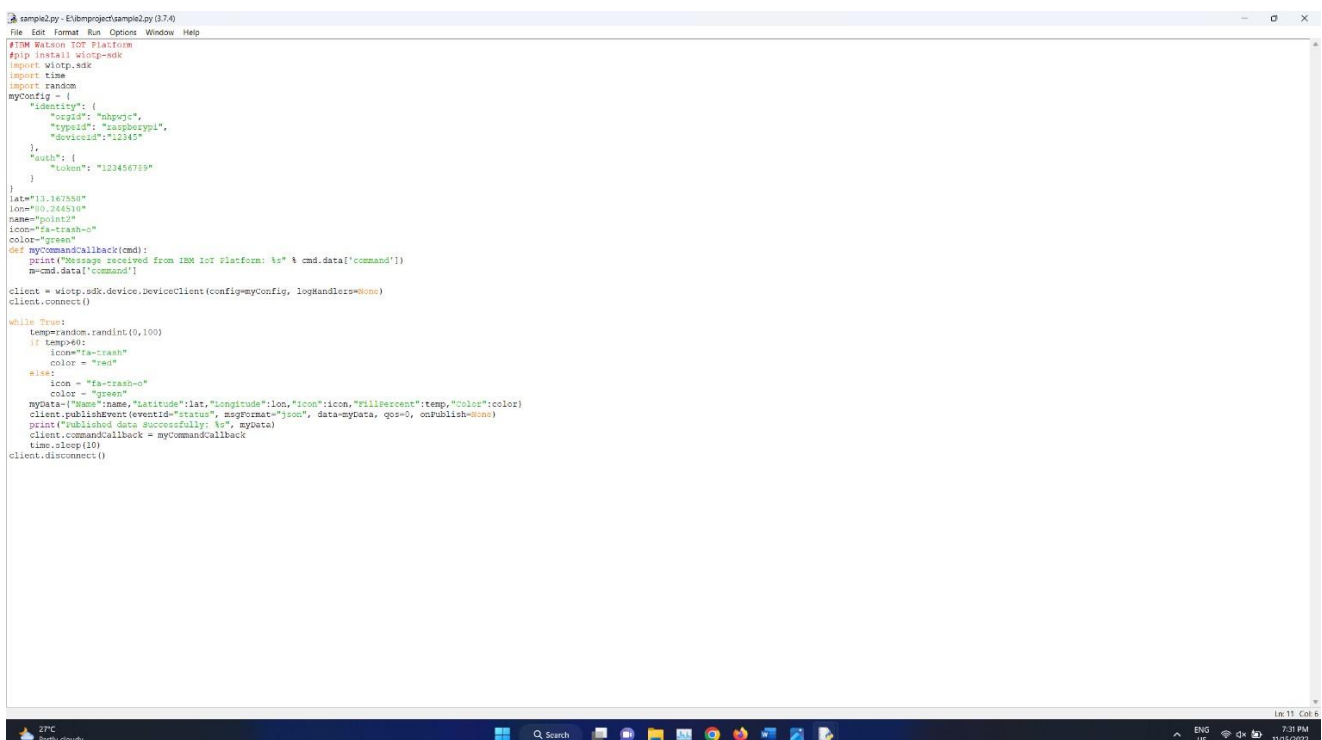
C:\Users\Arun K\PycharmProjects\pythonProject2\venv\Scripts\python.exe "C:\Users\Arun K\PycharmProjects\pythonProject2\main.py"

Published data Successfully: %s {'Name': 'point1', 'Latitude': '13.167589', 'Longitude': '88.248510', 'Icon': 'fa-trash-o', 'FillPercent': 21, 'Color': 'green'}

2022-11-15 18:07:24,371 wiotp.sdk.device.client.DeviceClient INFO Connected successfully: d:\hp\jio\NodeMCU-12345

Published data Successfully: %s {'Name': 'point1', 'Latitude': '13.167589', 'Longitude': '88.248510', 'Icon': 'fa-trash', 'FillPercent': 99, 'Color': 'red'}

For BIN 2:



```
1 #IBM Watson IoT Platform
2 #pip install wiotp-sdk
3 import wiotp.sdk
4 import time
5 import random
6
7 myConfig = {
8     "identity": {
9         "orgid": "mhpujio",
10        "typeid": "raspberrypi",
11        "deviceid": "12345"
12    },
13    "auth": {
14        "token": "123456789"
15    }
16 }
17
18 lat="13.167589"
19 lon="88.248510"
20 name="point2"
21 icon="fa-trash-o"
22 color="green"
23
24 def myCommandCallback(cmd):
25     print("Message received from IBM IoT Platform: %s" % cmd.data['command'])
26     m=cmd.data['command']
27
28 client = wiotp.sdk.device.DeviceClient(config=myConfig, loghandlers=None)
29 client.connect()
30
31 while True:
32     temp=random.randint(0,100)
33     if temp<50:
34         icon="fa-trash"
35         color = "red"
36     else:
37         icon = "fa-trash-o"
38         color = "green"
39     myData={ "Name":name,"Latitude":lat,"Longitude":lon,"Icon":icon,"FillPercent":temp,"Color":color}
40     client.publishEvent(eventid="status", msgformat="json", data=myData, qos=0, onPublish=None)
41     print("Published data Successfully: %s" % myData)
42     client.commandCallback = myCommandCallback
43     time.sleep(10)
44 client.disconnect()
```

3) IBM Watson IOT platform:

Here we can see the output which has been passed from WOKWI Platform or Python Script to IBM Watson IOT platform.

The screenshot shows the IBM Watson IoT Platform interface. At the top, there's a navigation bar with 'Browse', 'Action', 'Device Types', and 'Interfaces'. Below this, a table lists devices. The first device, ID 12345, is 'Connected' and of type 'NodeMCU'. The 'Recent Events' tab is active, showing a live stream of data. The events are status updates with JSON payloads containing location information.

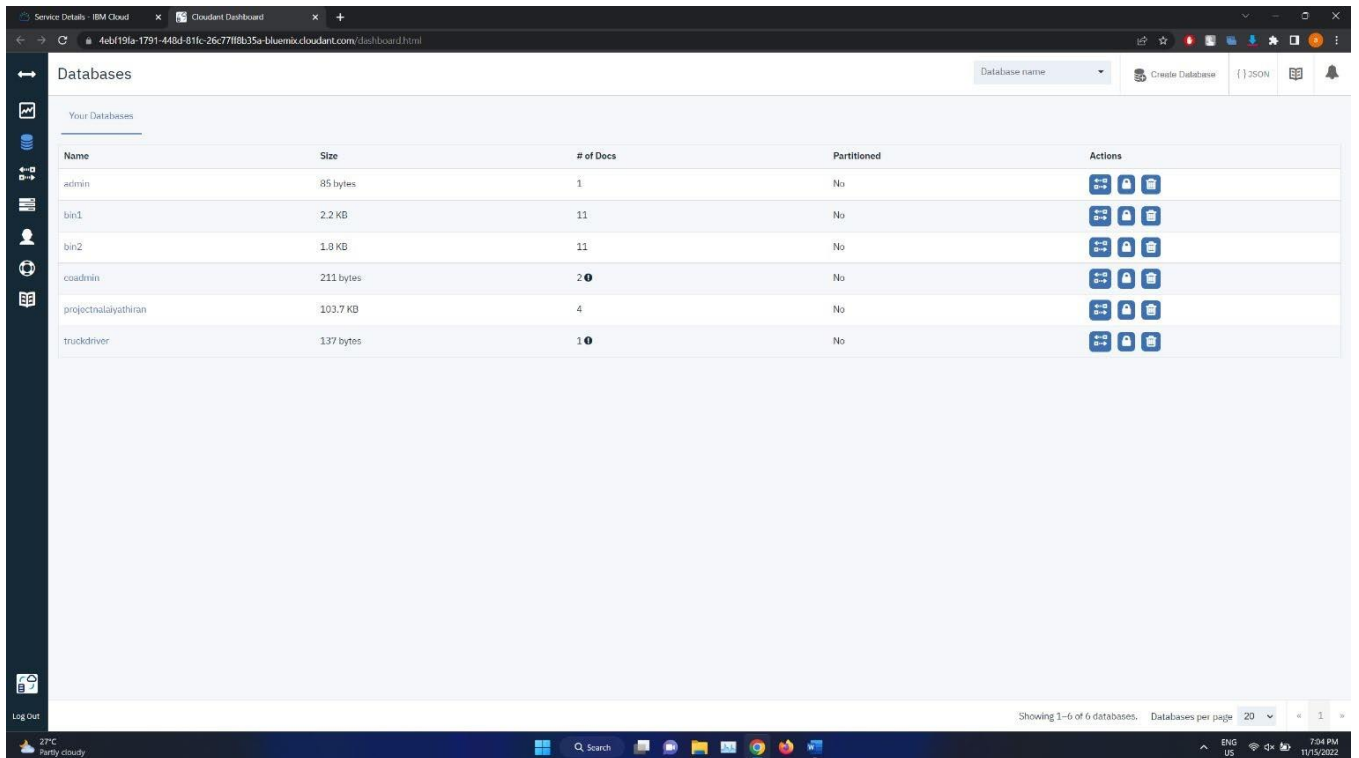
Event	Value	Format	Last Received
status	{\"Name\":\"point1\",\"Latitude\":\"13.167589\",\"Longi...	json	a few seconds ago
status	{\"Name\":\"point1\",\"Latitude\":\"13.167589\",\"Longi...	json	a few seconds ago
status	{\"Name\":\"point1\",\"Latitude\":\"13.167589\",\"Longi...	json	a few seconds ago
status	{\"Name\":\"point1\",\"Latitude\":\"13.167589\",\"Longi...	json	a few seconds ago
status	{\"Name\":\"point1\",\"Latitude\":\"13.167589\",\"Longi...	json	a few seconds ago

The Value which is passed is shown here.

This screenshot shows the same IBM Watson IoT Platform interface, but with an 'Event Payload' modal window open. The modal displays the raw JSON data received from the device. The background device list shows three devices: 12345 (NodeMCU, Disconnected), 12345 (dummy1, Disconnected), and 12345 (raspberrypi, Connected). The modal shows the event name 'status' and the time received 'Nov 15, 2022 7:54 PM'.

```
1 {
2   "Name": "point2",
3   "Latitude": "13.167589",
4   "Longitude": "80.344838",
5   "Icon": "ras-trash-0",
6   "FillPercent": 56,
7   "color": "green"
8 }
```

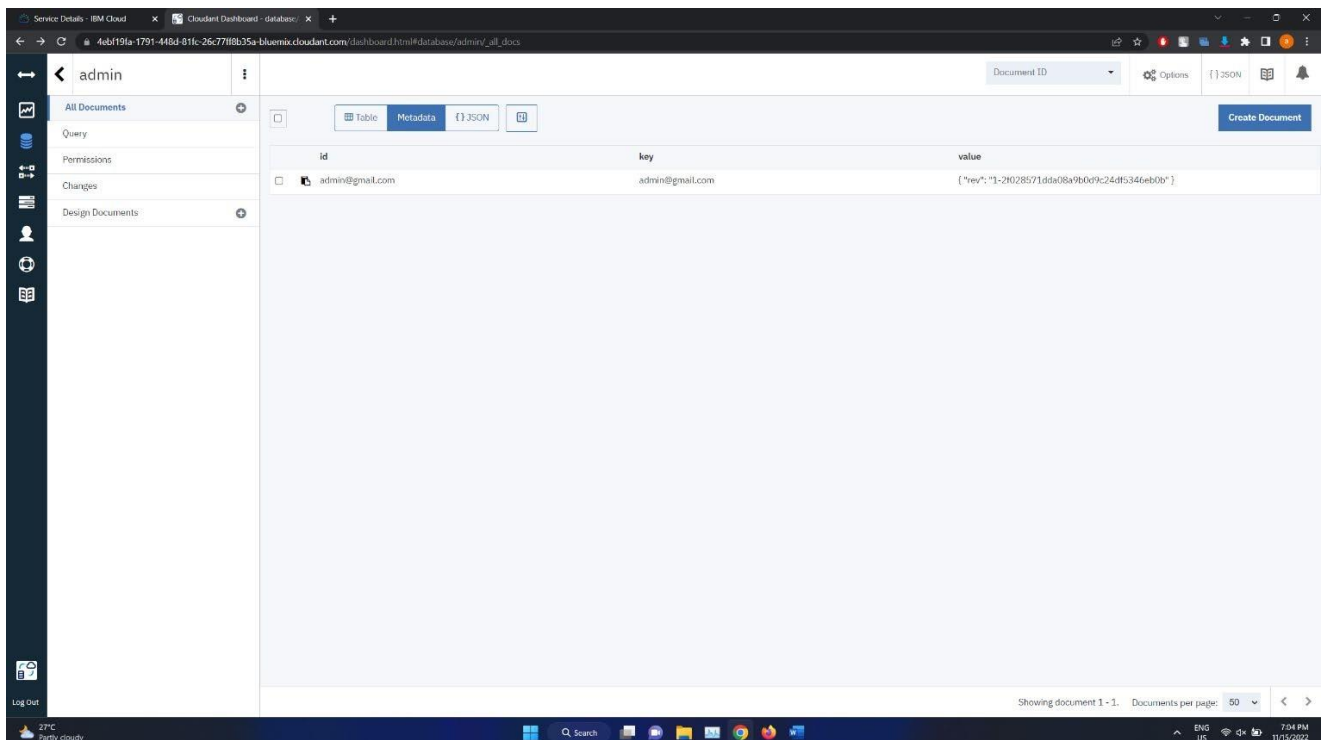
4) Cloudant DB:



The screenshot shows the Cloudant Dashboard interface. At the top, there's a navigation bar with a 'Databases' tab selected. Below this, a table lists the databases. The table has columns for Name, Size, # of Docs, Partitioned, and Actions. The databases listed are admin, bin1, bin2, coadmin, projectnalayathiran, and truckdriver. Each database has a size, a number of documents, and a 'Partitioned' status. The 'Actions' column contains icons for adding, deleting, and refreshing documents.

Name	Size	# of Docs	Partitioned	Actions
admin	85 bytes	1	No	[Add] [Delete] [Refresh]
bin1	2.2 KB	11	No	[Add] [Delete] [Refresh]
bin2	1.8 KB	11	No	[Add] [Delete] [Refresh]
coadmin	211 bytes	2	No	[Add] [Delete] [Refresh]
projectnalayathiran	103.7 KB	4	No	[Add] [Delete] [Refresh]
truckdriver	137 bytes	1	No	[Add] [Delete] [Refresh]

Admin Database:



The screenshot shows the Cloudant Dashboard interface for the 'admin' database. The left sidebar has a 'Documents' tab selected. The main area displays a table of documents. The table has columns for id, key, and value. The document shown has an id of 'admin@gmail.com', a key of 'admin@gmail.com', and a value of '{"rev": "1-26028571d6a08a9b0c9c24df5346eb0b"}'.

id	key	value
admin@gmail.com	admin@gmail.com	{"rev": "1-26028571d6a08a9b0c9c24df5346eb0b"}

Co-admin Database:

The screenshot shows the IBM Cloud dashboard for the 'coadmin' database. The interface includes a sidebar with navigation options like 'All Documents', 'Query', 'Permissions', 'Changes', and 'Design Documents'. The main area displays a table with columns 'id', 'key', and 'value'. The table contains two documents. The first document has an ID of '111719106009@smartinertnz.com', a key of '111719106009@smartinertnz.com', and a value of '{"rev": "3-7951ba80d9bdf73386e7d5d325fa98"}'. The second document has an ID of 'aswinkumar@gmail.com', a key of 'aswinkumar@gmail.com', and a value of '{"rev": "1-2016876a97af01e9d986c0f1fed28080"}'. The bottom status bar indicates 'Showing document 1 - 2' and 'Documents per page: 50'.

id	key	value
111719106009@smartinertnz.com	111719106009@smartinertnz.com	{"rev": "3-7951ba80d9bdf73386e7d5d325fa98"}
aswinkumar@gmail.com	aswinkumar@gmail.com	{"rev": "1-2016876a97af01e9d986c0f1fed28080"}

Truck Driver Database:

The screenshot shows the IBM Cloud dashboard for the 'truckdriver' database. The interface is similar to the Co-admin Database, with a sidebar and a main table view. The table contains one document with an ID of '111719106030@smartinertnz.com', a key of '111719106030@smartinertnz.com', and a value of '{"rev": "1-3c62ab799d3ac4830690412414b02213"}'. The bottom status bar indicates 'Showing document 1 - 1' and 'Documents per page: 50'.

id	key	value
111719106030@smartinertnz.com	111719106030@smartinertnz.com	{"rev": "1-3c62ab799d3ac4830690412414b02213"}

BIN 1 Database

The screenshot shows the Cloudant Dashboard interface for the 'bin1' database. The document ID is '13ccc149aae52ab418e026cf32a379be'. The document content is a JSON object with the following fields:

```
{
  "_id": "13ccc149aae52ab418e026cf32a379be",
  "_rev": "1-03aef82043d4eeab38a523896c7405",
  "Name": "point1",
  "Time": "11/15/2022, 4:15:27 AM",
  "Time": "09:45",
  "Date": "2022-11-15",
  "Locality": "Rathur",
  "Address": "PLOT NO 3013, 1ST CROSS STREET, THB, RWBA, THB Layout, Rathur, Tamil Nadu 686608, India"
}
```

The interface includes a 'Save Changes' button, an 'Upload Attachment' button, a 'Clone Document' button, and a 'Delete' button. The status bar at the bottom shows '27°C Partly cloudy' and the time '7:04 PM 11/15/2022'.

BIN 2 Database

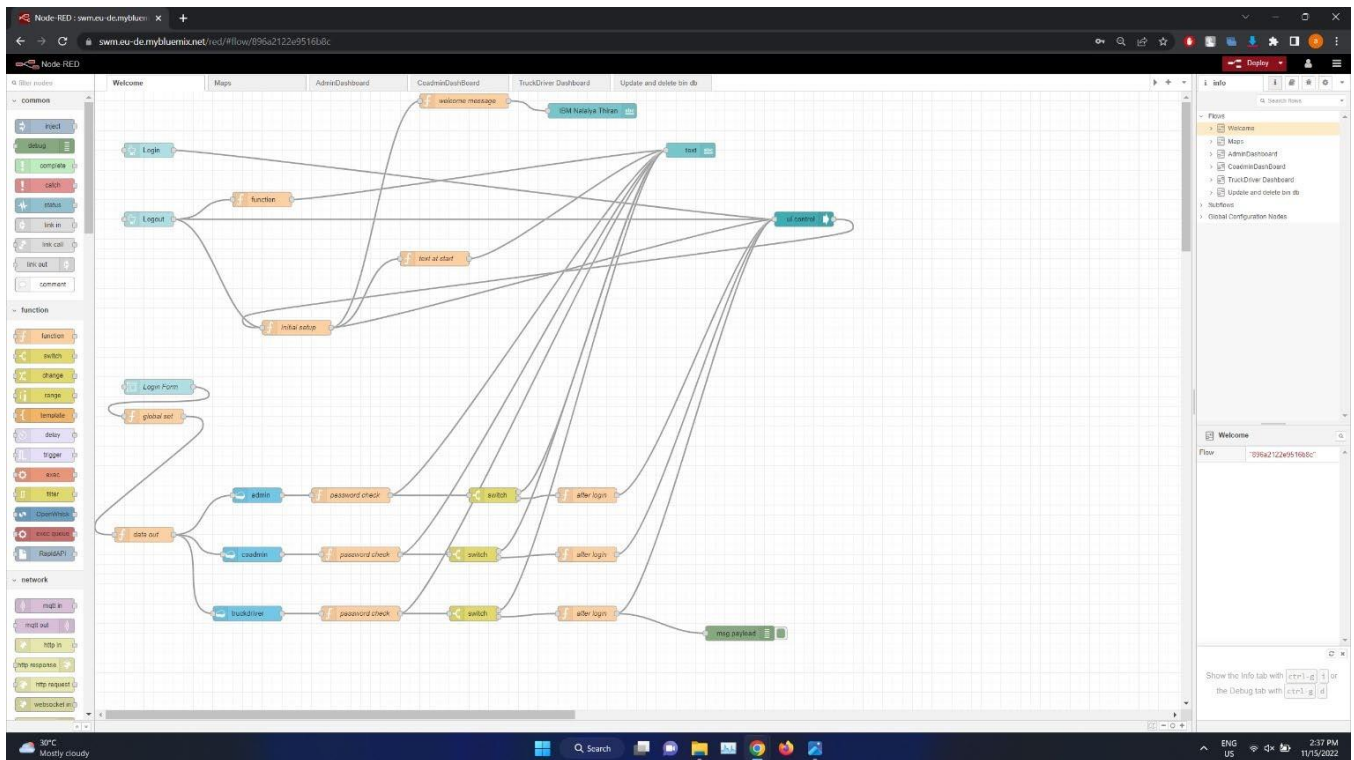
The screenshot shows the Cloudant Dashboard interface for the 'bin2' database. The document ID is '172fc4773b835fb65196b2899c5c4097'. The document content is a JSON object with the following fields:

```
{
  "_id": "172fc4773b835fb65196b2899c5c4097",
  "_rev": "1-a061969cd5f97383513d3f3439df8",
  "Name": "point2",
  "Time": "11/14/2022, 3:29:32 PM",
  "Time": "21:00",
  "Date": "2022-11-14",
  "Locality": "Rathur",
  "Address": "4094, THB Layout, Rathur, Tamil Nadu 686051, India"
}
```

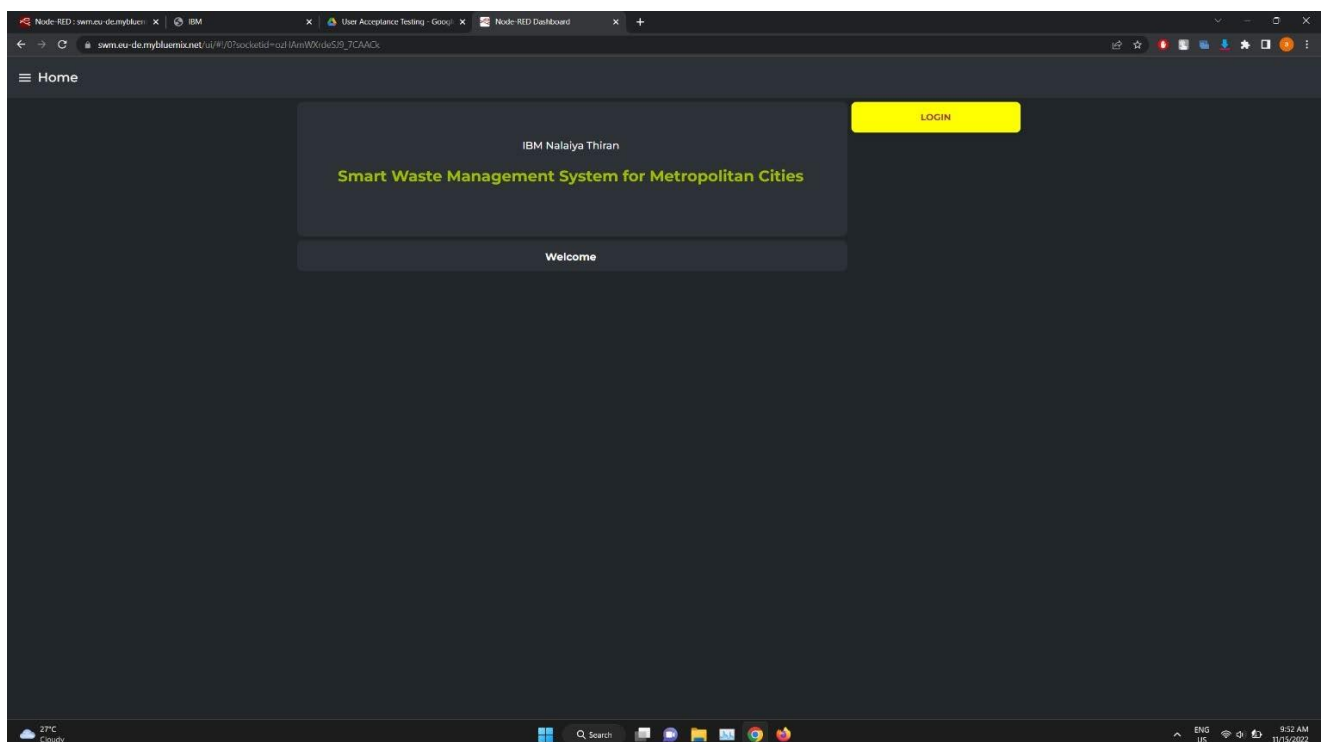
The interface includes a 'Save Changes' button, an 'Upload Attachment' button, a 'Clone Document' button, and a 'Delete' button. The status bar at the bottom shows '27°C Partly cloudy' and the time '7:04 PM 11/15/2022'.

5) Node RED flow

Login/Logout (Home Page) Flow:

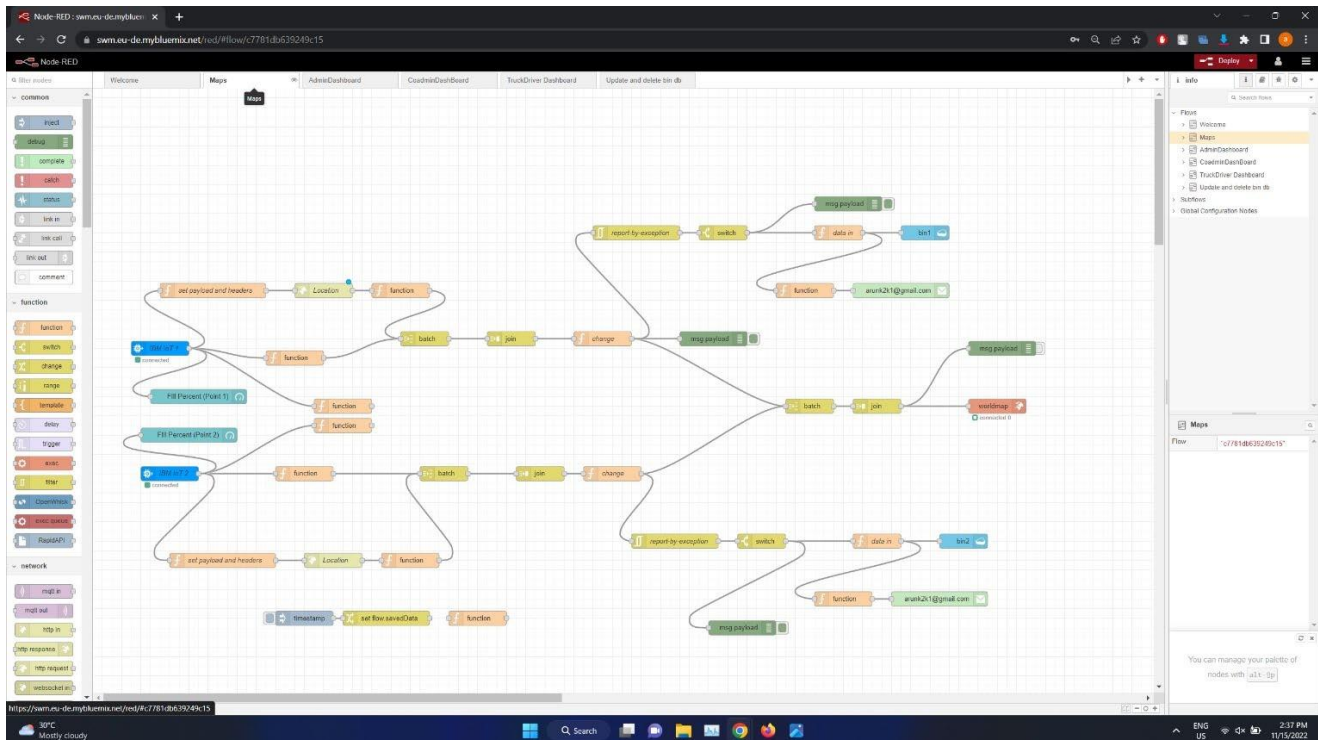


Home Page:

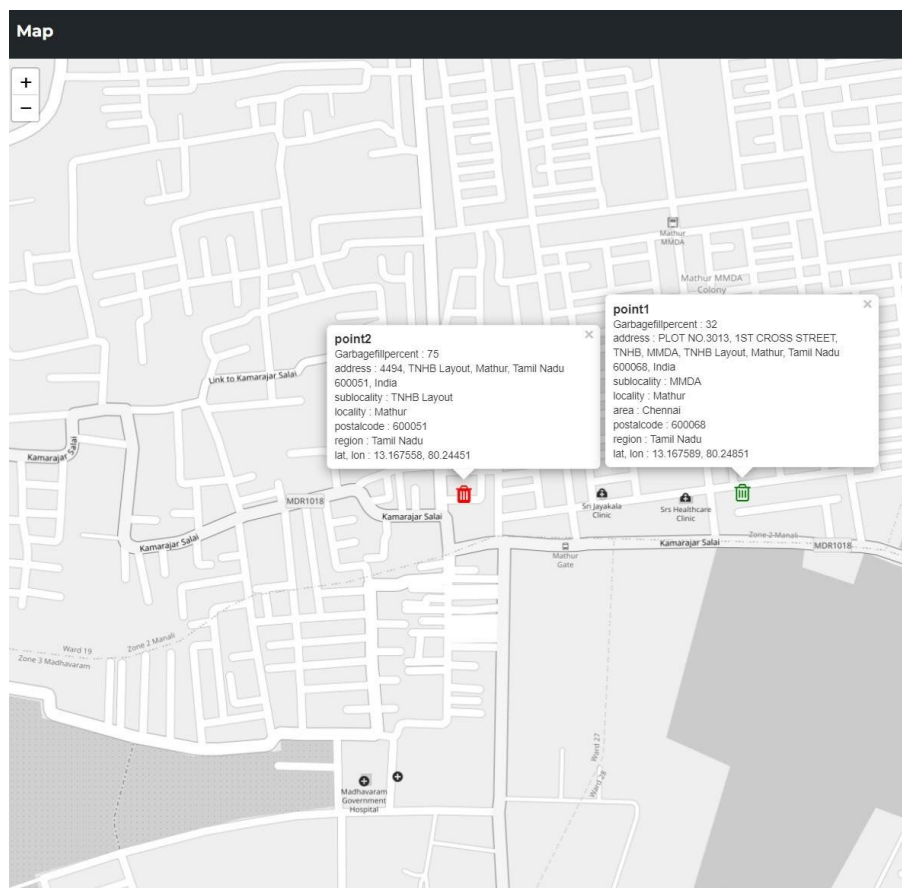


Map Flow:

It is used to push bin values got from the IBM Watson IOT platform and push them into Database

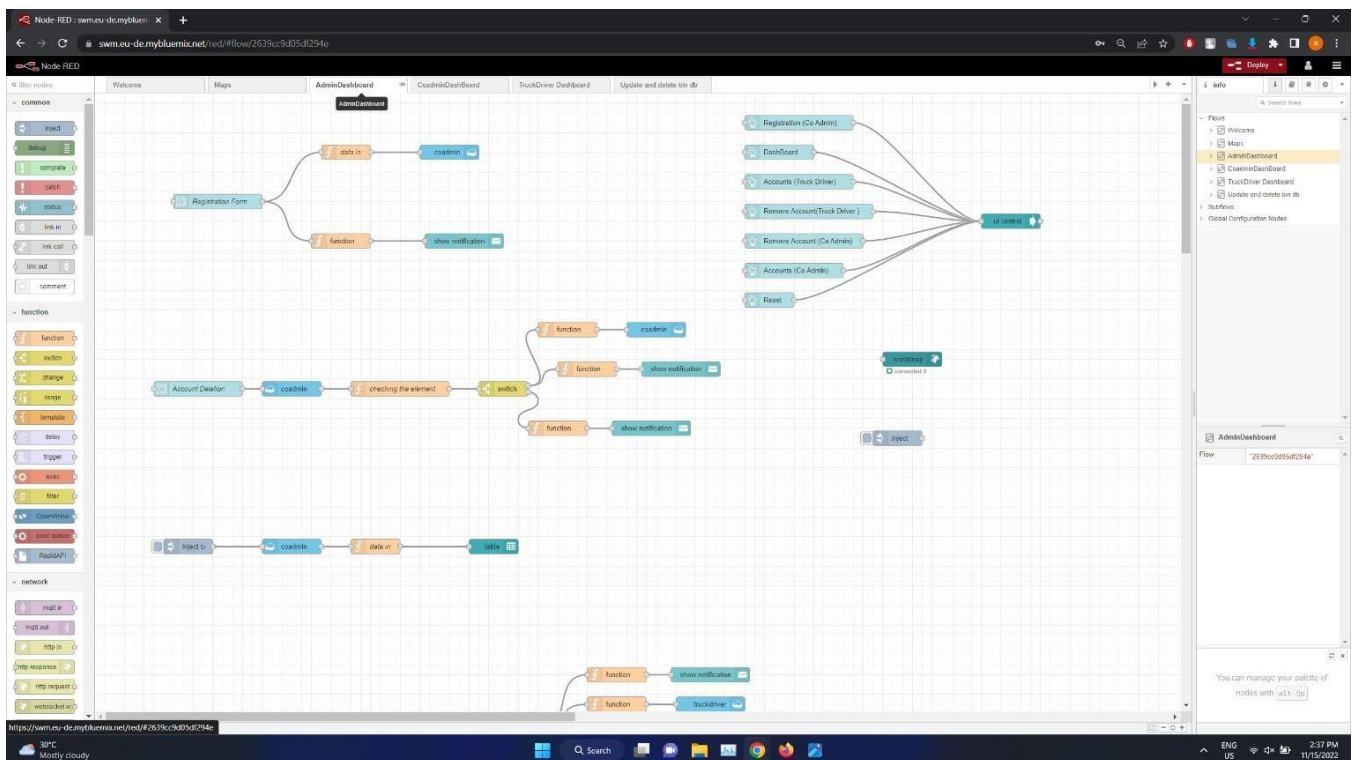


Map Output page:

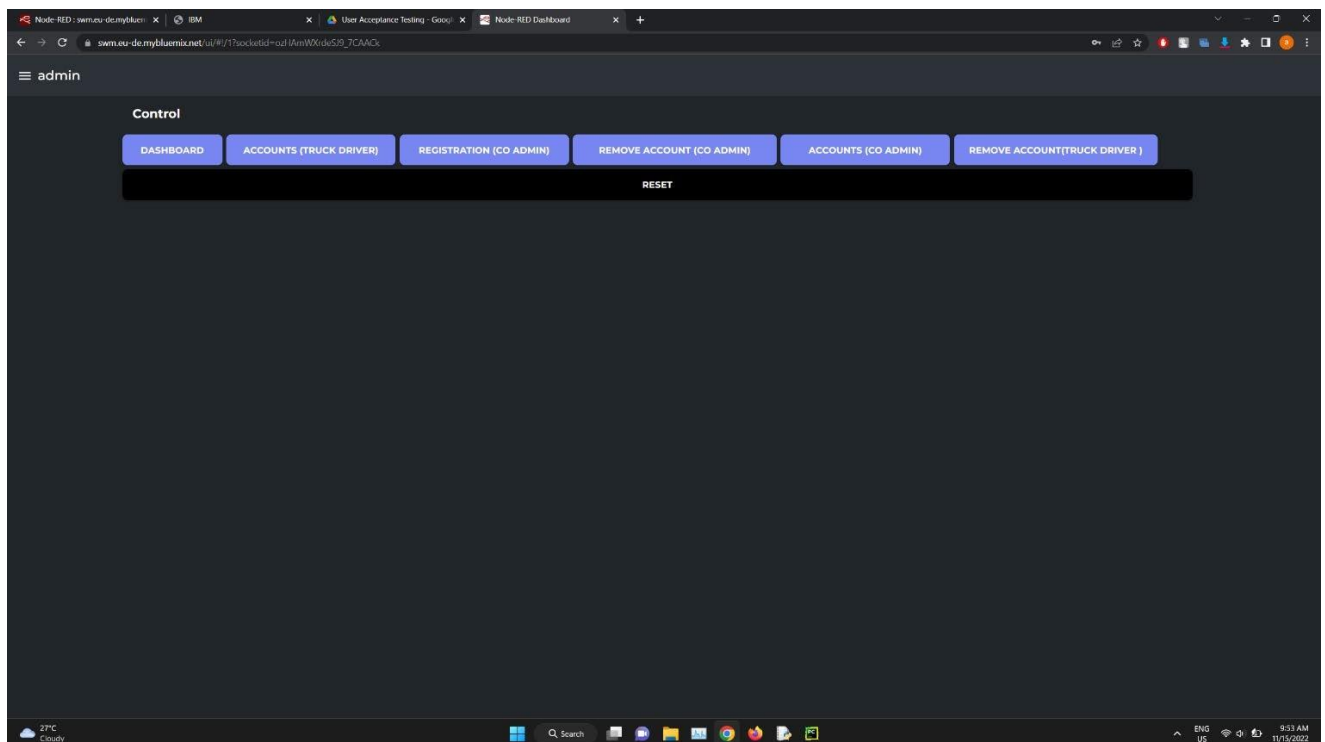


Admin Flow:

This flow helps to create all the buttons and UI for Admin page

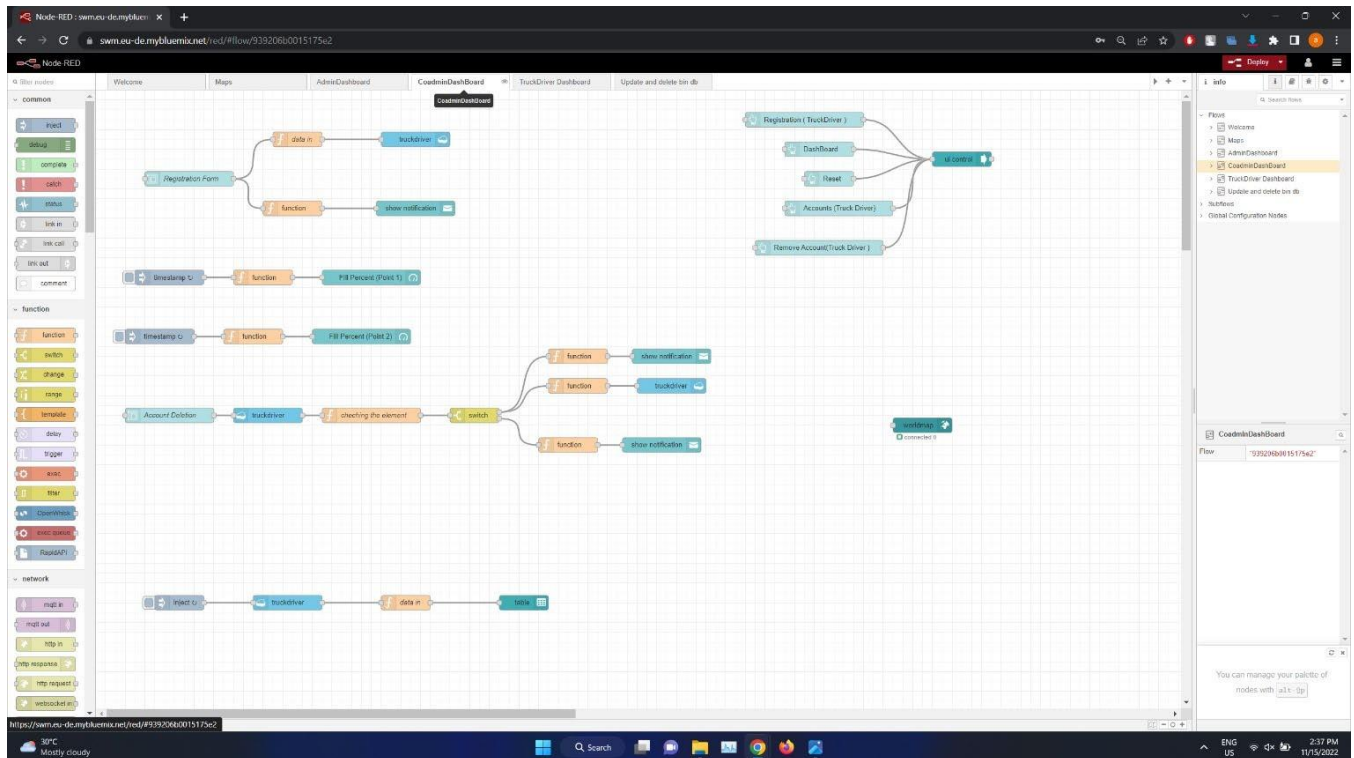


Admin Page:

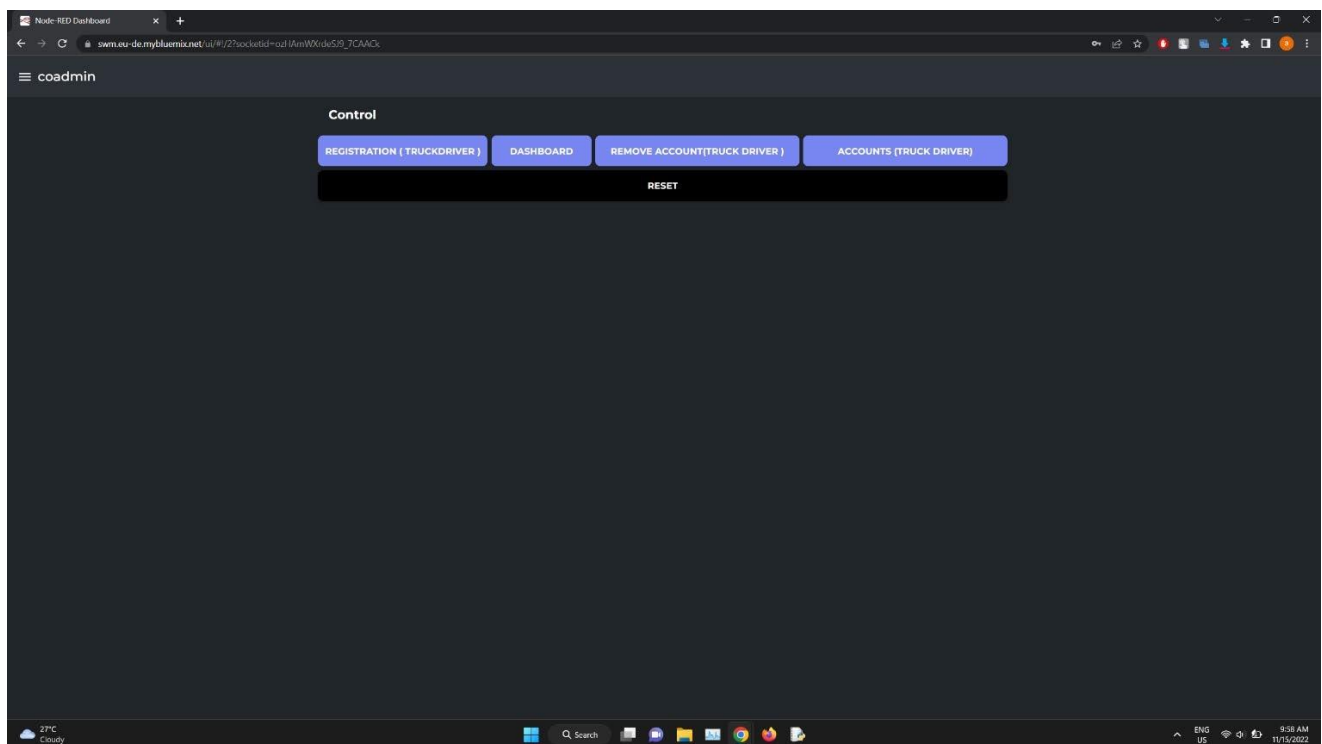


Co-Admin Flow:

Here we can see all the UI based functions used for Co-admin page.

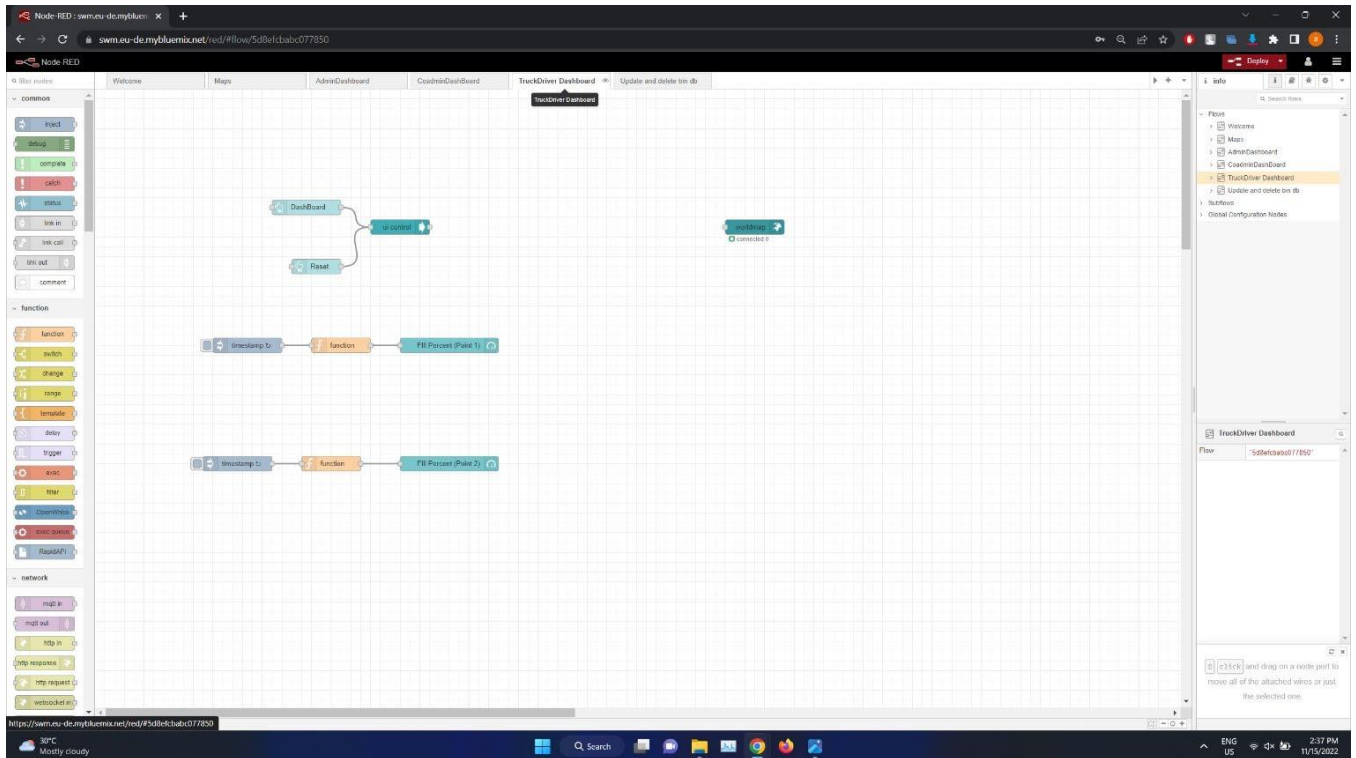


Co-Admin Output page:

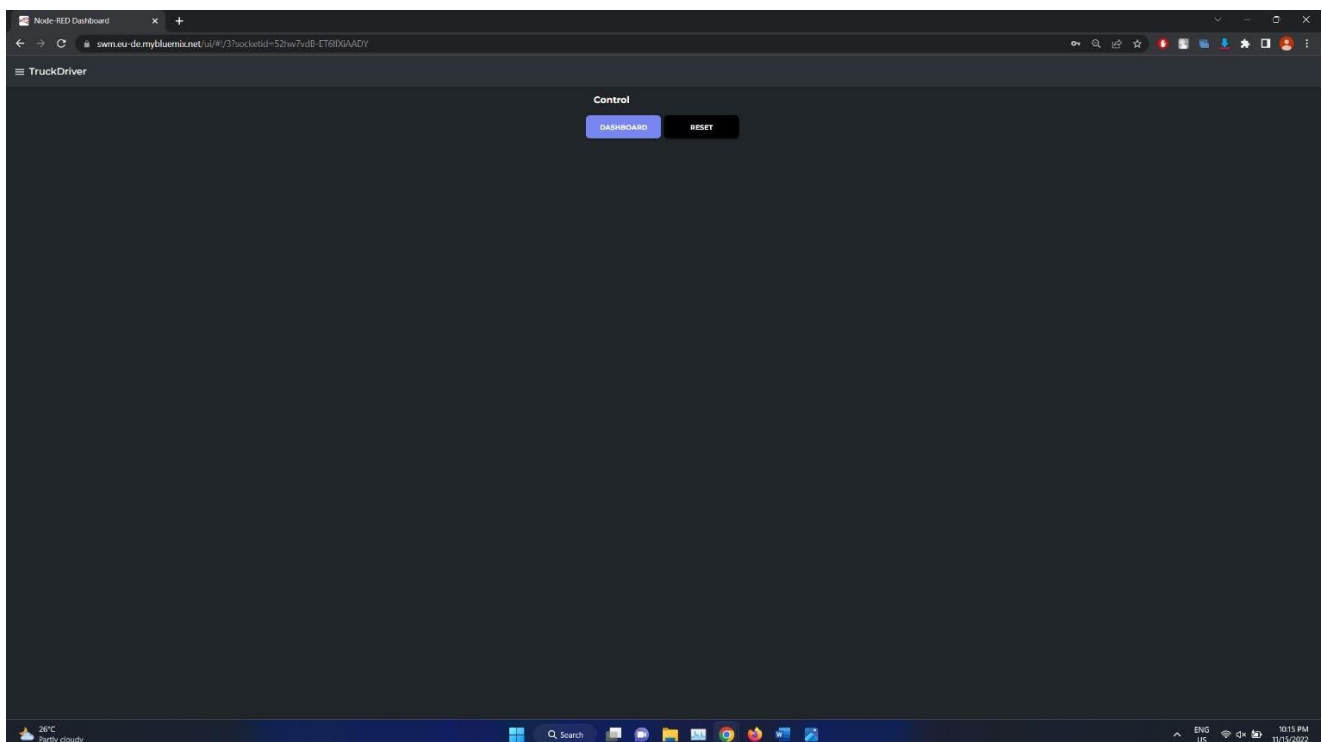


Truck Driver Flow:

Here we can see all the UI based functions used for Truck Driver page.

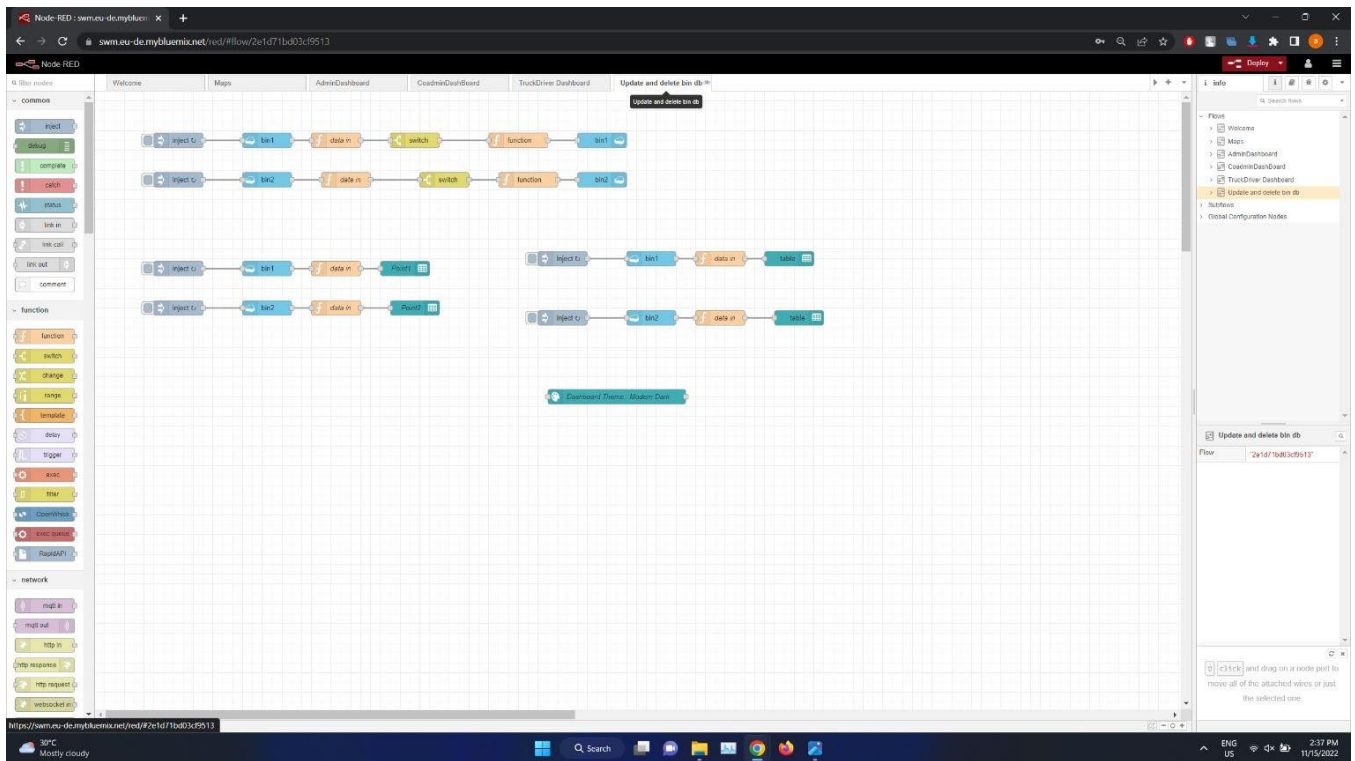


Truck Driver Output page:



Bin table Flow:

This flow used retrieve the data from the Database and push them into the Table.



Output:

Table

Name	Time	Date	Locality	Address
point1	09:45	2022-11-15	Mathur	PLOT NO.3013, 1ST CROSS STREET, TNHB, MMDA, TNHB Layout, Mathur, Tamil Nadu 600068, India
point1	09:34	2022-11-15	Mathur	PLOT NO.3013, 1ST CROSS STREET, TNHB, MMDA, TNHB Layout, Mathur, Tamil Nadu 600068, India
point1	09:33	2022-11-15	Mathur	PLOT NO.3013, 1ST CROSS STREET, TNHB, MMDA, TNHB Layout, Mathur, Tamil Nadu 600068, India
point1	21:33	2022-11-14	Mathur	PLOT NO.3013, 1ST CROSS STREET, TNHB, MMDA, TNHB Layout, Mathur, Tamil Nadu 600068, India
point1	21:30	2022-11-14	Mathur	PLOT NO.3013, 1ST CROSS STREET, TNHB, MMDA, TNHB Layout, Mathur, Tamil Nadu 600068, India
point1	21:00	2022-11-14	Mathur	PLOT NO.3013, 1ST CROSS STREET, TNHB, MMDA, TNHB Layout, Mathur, Tamil Nadu 600068, India
point1	20:59	2022-11-14	Mathur	PLOT NO.3013, 1ST CROSS STREET, TNHB, MMDA, TNHB Layout, Mathur, Tamil Nadu 600068, India
point1	20:58	2022-11-14	Mathur	PLOT NO.3013, 1ST CROSS STREET, TNHB, MMDA, TNHB Layout, Mathur, Tamil Nadu 600068, India
point1	20:58	2022-11-14	Mathur	PLOT NO.3013, 1ST CROSS STREET, TNHB, MMDA, TNHB Layout, Mathur, Tamil Nadu 600068, India
point1	20:58	2022-11-14	Mathur	PLOT NO.3013, 1ST CROSS STREET, TNHB, MMDA, TNHB Layout, Mathur, Tamil Nadu 600068, India
point2	10:24	2022-11-15	Mathur	4494, TNHB Layout, Mathur, Tamil Nadu 600051, India
point2	21:02	2022-11-14	Mathur	4494, TNHB Layout, Mathur, Tamil Nadu 600051, India
point2	21:00	2022-11-14	Mathur	4494, TNHB Layout, Mathur, Tamil Nadu 600051, India
point2	20:59	2022-11-14	Mathur	4494, TNHB Layout, Mathur, Tamil Nadu 600051, India
point2	20:59	2022-11-14	Mathur	4494, TNHB Layout, Mathur, Tamil Nadu 600051, India
point2	20:59	2022-11-14	Mathur	4494, TNHB Layout, Mathur, Tamil Nadu 600051, India
point2	20:58	2022-11-14	Mathur	4494, TNHB Layout, Mathur, Tamil Nadu 600051, India
point2	20:58	2022-11-14	Mathur	4494, TNHB Layout, Mathur, Tamil Nadu 600051, India
point2	20:57	2022-11-14	Mathur	4494, TNHB Layout, Mathur, Tamil Nadu 600051, India
point2	20:57	2022-11-14	Mathur	4494, TNHB Layout, Mathur, Tamil Nadu 600051, India