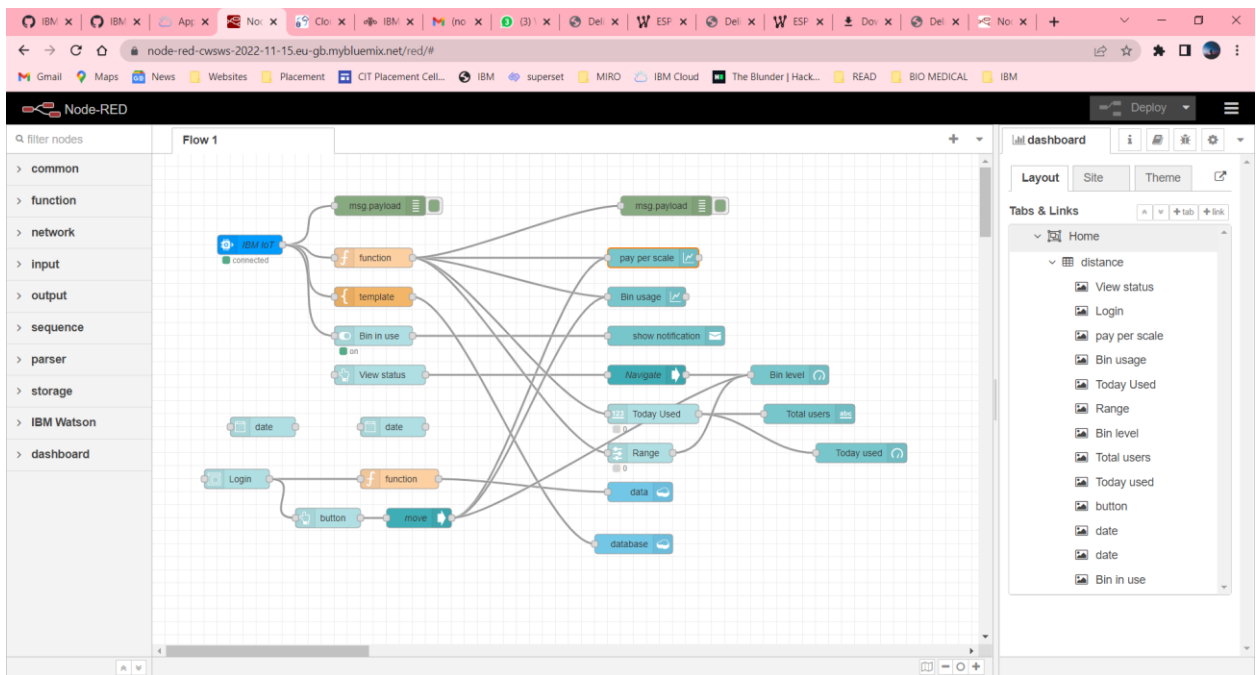


# Delivery of Sprint – 3

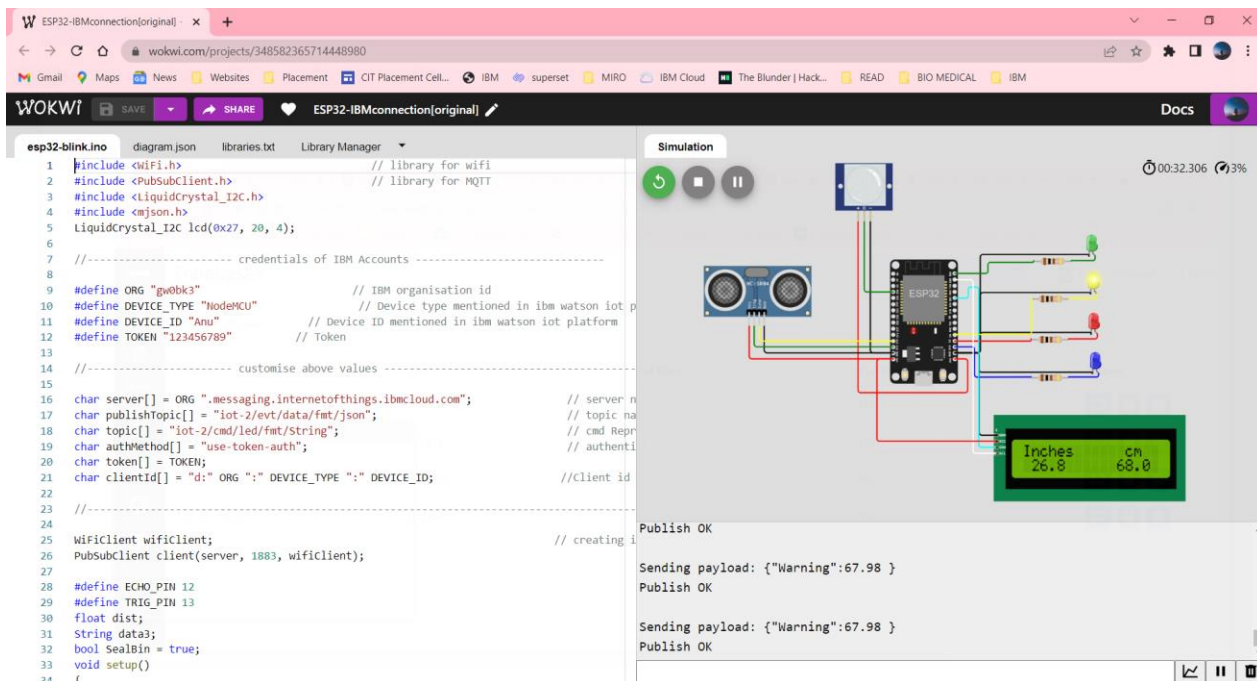
## Node Red Connection to IBM Cloudant

Date	12/11/2022
Team ID	PNT2022TMID52815
Project Name	Smart Waste Management for Metropolitan Cities - IOT

1. Node-RED Connection setup for data transmission from IBM Watson IOT platform to Node-REDdashboard.



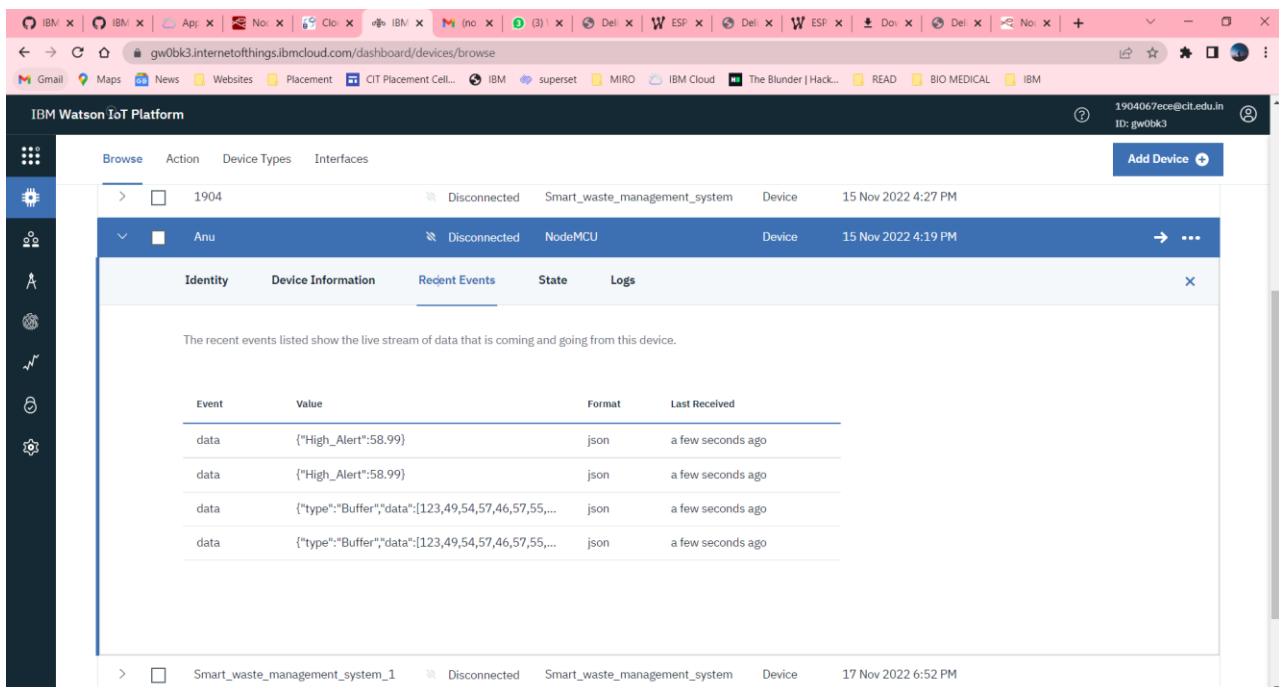
## 2. Simulate Wokwi connection to transmit data from wokwi account to IBM Watson IOT platform and then to Node Red dashboard.



The screenshot shows the Wokwi IDE interface. On the left, the code for `esp32-blink.ino` is displayed, which includes libraries for WiFi, MQTT, and a LiquidCrystal\_I2C display. The code configures an ESP32 to connect to an IBM Watson IoT platform using MQTT. The simulation on the right shows an ESP32 board connected to a buzzer, a potentiometer, and an I2C display showing "Inches 26.8 cm 68.0". The console shows successful MQTT connections and data publishing.

```
1 #include <WiFi.h> // library for wifi
2 #include <PubSubClient.h> // library for MQTT
3 #include <LiquidCrystal_I2C.h>
4 #include <json.h>
5 LiquidCrystal_I2C lcd(0x27, 20, 4);
6
7 //----- credentials of IBM Accounts -----
8
9 #define ORG "gw0bk3" // IBM organisation id
10 #define DEVICE_TYPE "NodeMCU" // Device type mentioned in ibm watson iot p
11 #define DEVICE_ID "Anu" // Device ID mentioned in ibm watson iot platform
12 #define TOKEN "123456789" // Token
13
14 //----- customise above values -----
15
16 char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; // server n
17 char publishTopic[] = "iot-2/evt/data/fmt/json"; // topic na
18 char topic[] = "iot-2/cmd/led/fmt/String"; // cmd Repr
19 char authMethod[] = "use-token-auth"; // authenti
20 char token[] = TOKEN;
21 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID; //client id
22
23 //-----
24
25 WiFiClient wificlient; // creating i
26 PubSubClient client(server, 1883, wificlient);
27
28 #define ECHO_PIN 12
29 #define TRIG_PIN 13
30 float dist;
31 String data3;
32 bool SealBin = true;
33 void setup()
34 {
```

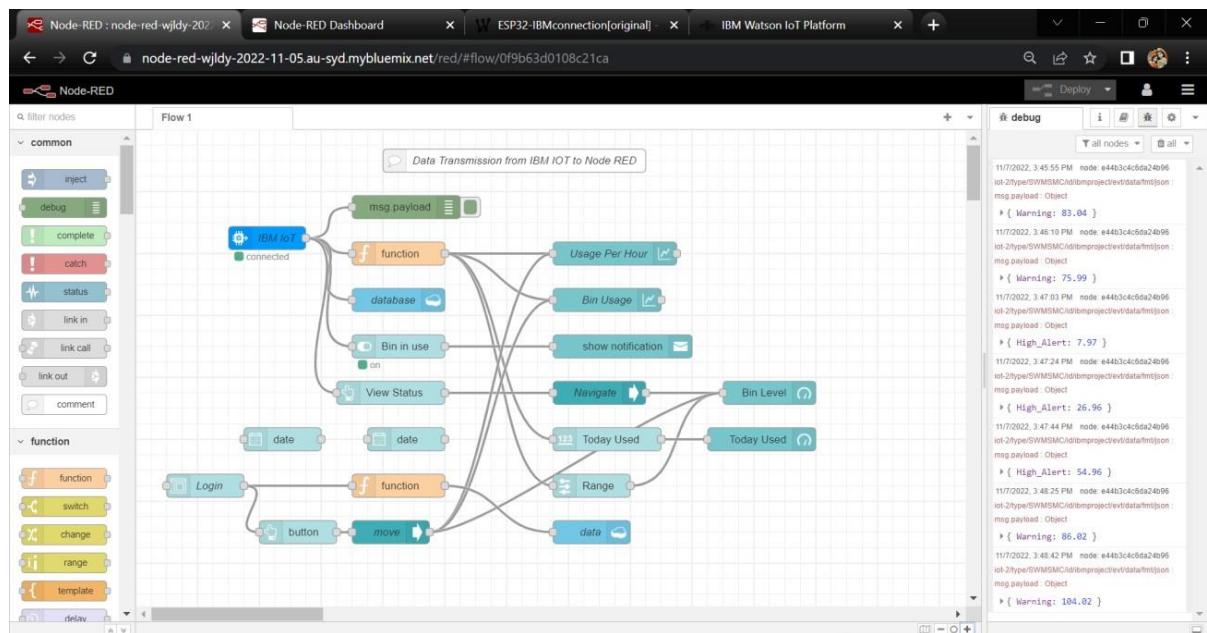
## 3. Data transfer to Watson IOT platform.



The screenshot shows the IBM Watson IoT Platform dashboard. The top navigation bar includes "Browse", "Action", "Device Types", and "Interfaces". The main content area displays a list of devices, including "1904" (Disconnected, Smart\_waste\_management\_system) and "Anu" (Disconnected, NodeMCU). The "Anu" device is selected, showing its details and a "Recent Events" tab. The events table lists data received from the device, including high alert notifications and buffer data.

Event	Value	Format	Last Received
data	{"High_Alert":58.99}	json	a few seconds ago
data	{"High_Alert":58.99}	json	a few seconds ago
data	{"type":"Buffer","data":[123,49,54,57,46,57,55,...	json	a few seconds ago
data	{"type":"Buffer","data":[123,49,54,57,46,57,55,...	json	a few seconds ago

#### 4.Data transfer from IBM Watson IOT platform and wokwi to Node red.



#### 5.Storing database in IBM cloudant DB.

The screenshot shows the IBM Cloudant Databases dashboard. The "Your Databases" section contains a table with the following data:

Name	Size	# of Docs	Partitioned	Actions
data	202 bytes	2	No	[Icons for edit, delete, etc.]
database	3.7 KB	21	No	[Icons for edit, delete, etc.]
noderedcws20221115	30.3 KB	4	No	[Icons for edit, delete, etc.]
smart_waste	0 bytes	0	Yes	[Icons for edit, delete, etc.]

At the bottom of the dashboard, it says "Showing 1-4 of 4 databases. Databases per page 20".

The screenshot shows the Cloudant Dashboard interface. The browser address bar displays the URL: `b5a20bce-bc2a-49f8-89ce-9e47e9edba7e-bluemix.cloudant.com/dashboard.html#/database/database/_all_docs`. The dashboard title is "database". On the left sidebar, there are navigation options: "All Documents", "Query", "Permissions", "Changes", and "Design Documents". The main content area shows a table of documents with columns "id", "key", and "value". The table lists 11 documents, each with a unique ID and a JSON value. A "Create Document" button is visible in the top right corner of the table area. At the bottom, it says "Showing document 1 - 11. Documents per page: 20".

id	key	value
10d69c10317178f83d7d178a4f573fde	10d69c10317178f83d7d178a4f573fde	{ "_rev": "1-f731038f905946f4e1279554b992b..." }
1ec8f131638ba727ee3f8c05bd9ee868	1ec8f131638ba727ee3f8c05bd9ee868	{ "_rev": "1-f731038f905946f4e1279554b992b..." }
5b72d602b60a1186c691608712c0ec0b	5b72d602b60a1186c691608712c0ec0b	{ "_rev": "1-f731038f905946f4e1279554b992b..." }
5c0fa8598483f0d6bd6189a625d6d41d	5c0fa8598483f0d6bd6189a625d6d41d	{ "_rev": "1-f731038f905946f4e1279554b992b..." }
653efc7317cc0d26dee8e004fc5170c6	653efc7317cc0d26dee8e004fc5170c6	{ "_rev": "1-f731038f905946f4e1279554b992b..." }
653efc7317cc0d26dee8e004fc5a7fde	653efc7317cc0d26dee8e004fc5a7fde	{ "_rev": "1-f731038f905946f4e1279554b992b..." }
8c81919ec2bdcab5780d84055a683ba5	8c81919ec2bdcab5780d84055a683ba5	{ "_rev": "1-f731038f905946f4e1279554b992b..." }
ba321918c25b88721a4e6ff1825012e6	ba321918c25b88721a4e6ff1825012e6	{ "_rev": "1-f731038f905946f4e1279554b992b..." }
d1d0bb48285ac000788eff17d22b91fa	d1d0bb48285ac000788eff17d22b91fa	{ "_rev": "1-f731038f905946f4e1279554b992b..." }
d77314922a6712855da32b3a92d7923	d77314922a6712855da32b3a92d7923	{ "_rev": "1-f731038f905946f4e1279554b992b..." }
f9ab5f71a978f09f3029bec00c1a4bcc	f9ab5f71a978f09f3029bec00c1a4bcc	{ "_rev": "1-f731038f905946f4e1279554b992b..." }

## 6.Data is stored in JSON format

The screenshot shows the Cloudant Dashboard interface with a specific document selected. The browser address bar displays the URL: `b5a20bce-bc2a-49f8-89ce-9e47e9edba7e-bluemix.cloudant.com/dashboard.html#/database/database/5c0fa8598483f0d6bd6189a625d6d41d`. The dashboard title is "database". The document ID is "5c0fa8598483f0d6bd6189a625d6d41d". The document content is displayed in a text area, showing a JSON object. The JSON object has the following structure:

```

{
  "_id": "5c0fa8598483f0d6bd6189a625d6d41d",
  "_rev": "1-f731038f905946f4e1279554b992b9f9",
  "topic": "iot-2/type/NodeMCU/id/Anu/evt/data/fmt/json",
  "payload": "This is the payload: [object Object] !",
  "deviceId": "Anu",
  "deviceType": "NodeMCU",
  "eventType": "data",
  "format": "json"
}

```

At the top of the document view, there are buttons for "Save Changes", "Cancel", "Upload Attachment", "Clone Document", and "Delete".

