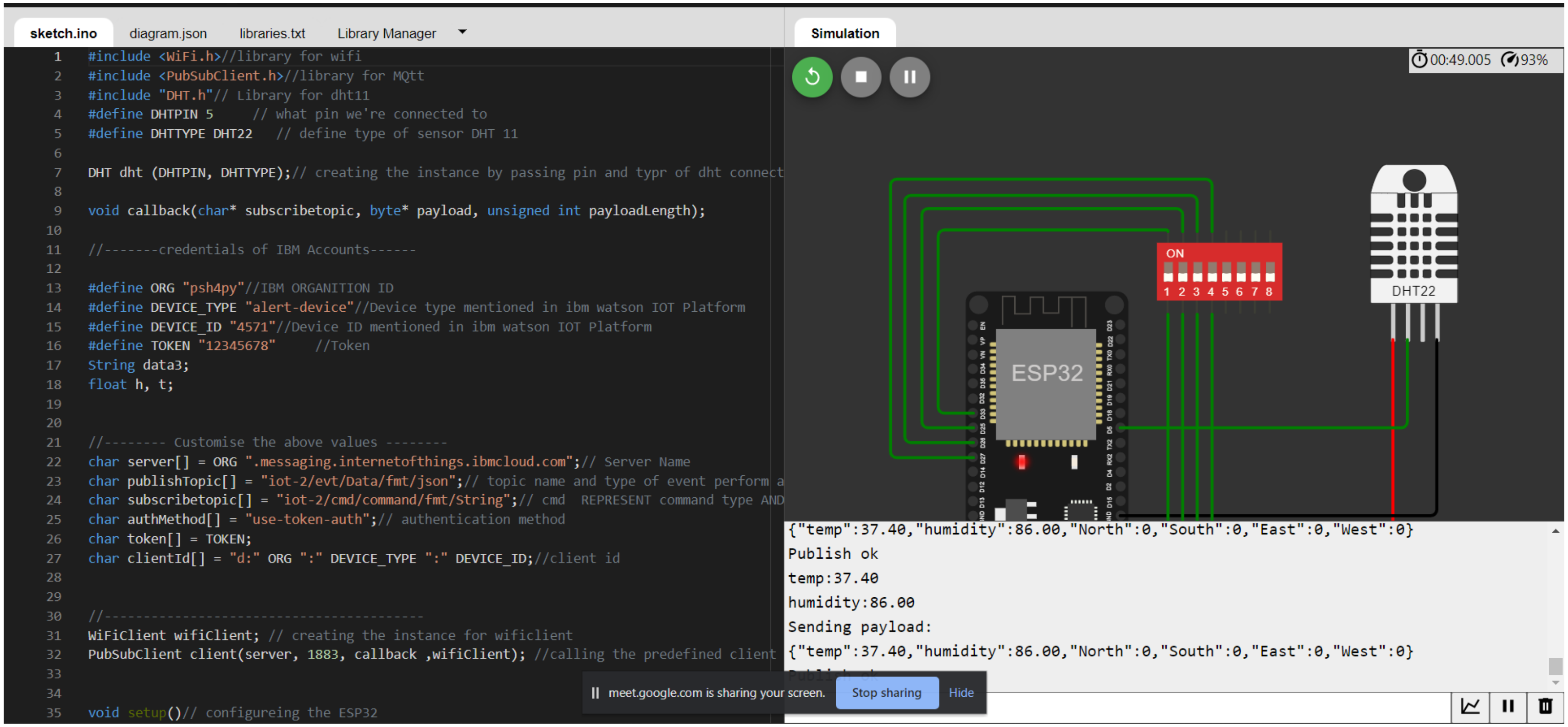
Project Development Phase
Sprint-3: MIT App Design and Testing

Date	14 November 2022
Team ID	PNT2022TMID29479
Project Name	Project – Signs with Smart Connectivity for Better Road Safety
Batch	B2-2M4E

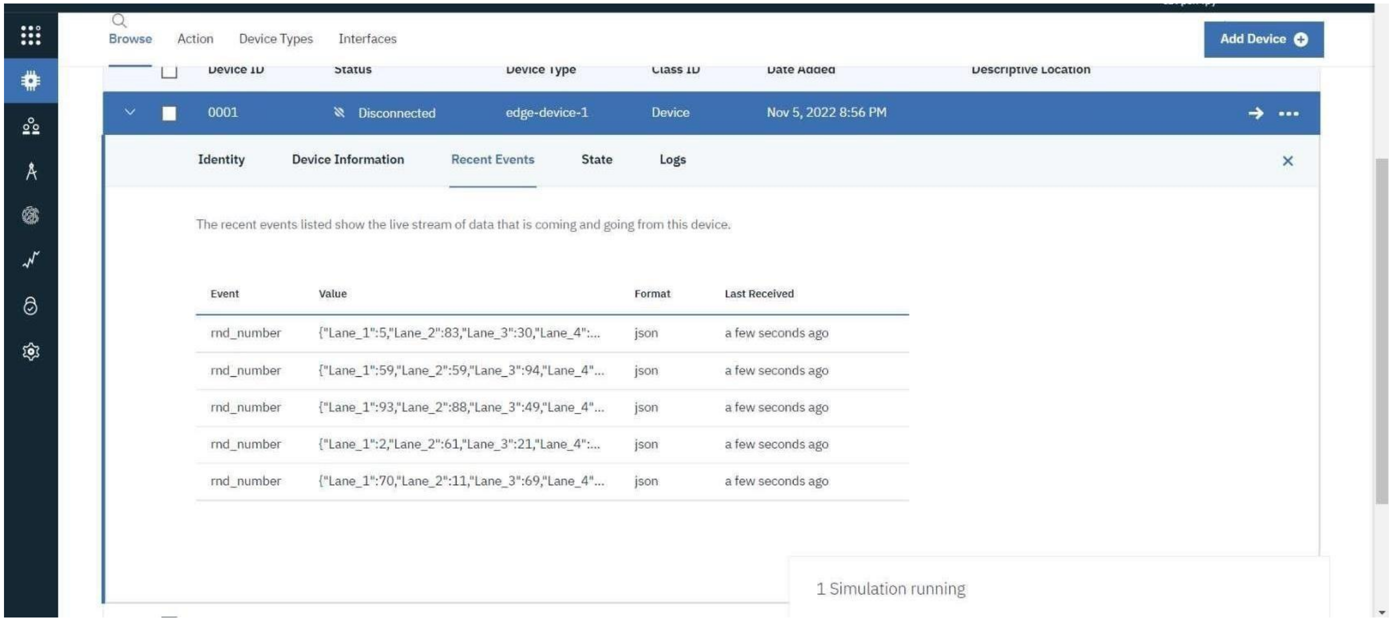
Wokwi Simulation:



```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt
#include "DHT.h"// Library for dht11
#define DHTPIN 5     // what pin we're connected to
#define DHTTYPE DHT22   // define type of sensor DHT 11

DHT dht (DHTPIN, DHTTYPE);// creating the instance by passing pin and typr of dht connect

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);

//-------credentials of IBM Accounts------

#define ORG "psh4py"//IBM ORGANITION ID
#define DEVICE_TYPE "alert-device"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "4571"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "12345678"     //Token
String data3;
float h, t;


//-------- Customise the above values --------
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name
char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of event perform a
char subscribetopic[] = "iot-2/cmd/command/fmt/String";// cmd  REPRESENT command type AND
char authMethod[] = "use-token-auth";// authentication method
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id


//-----------------------------------------
WiFiClient wifiClient; // creating the instance for wificlient
PubSubClient client(server, 1883, callback ,wifiClient); //calling the predefined client


void setup()// configureing the ESP32
```

```
{"temp":37.40,"humidity":86.00,"North":0,"South":0,"East":0,"West":0}
Publish ok
temp:37.40
humidity:86.00
Sending payload:
{"temp":37.40,"humidity":86.00,"North":0,"South":0,"East":0,"West":0}
```

IoT Device – IoT Platform



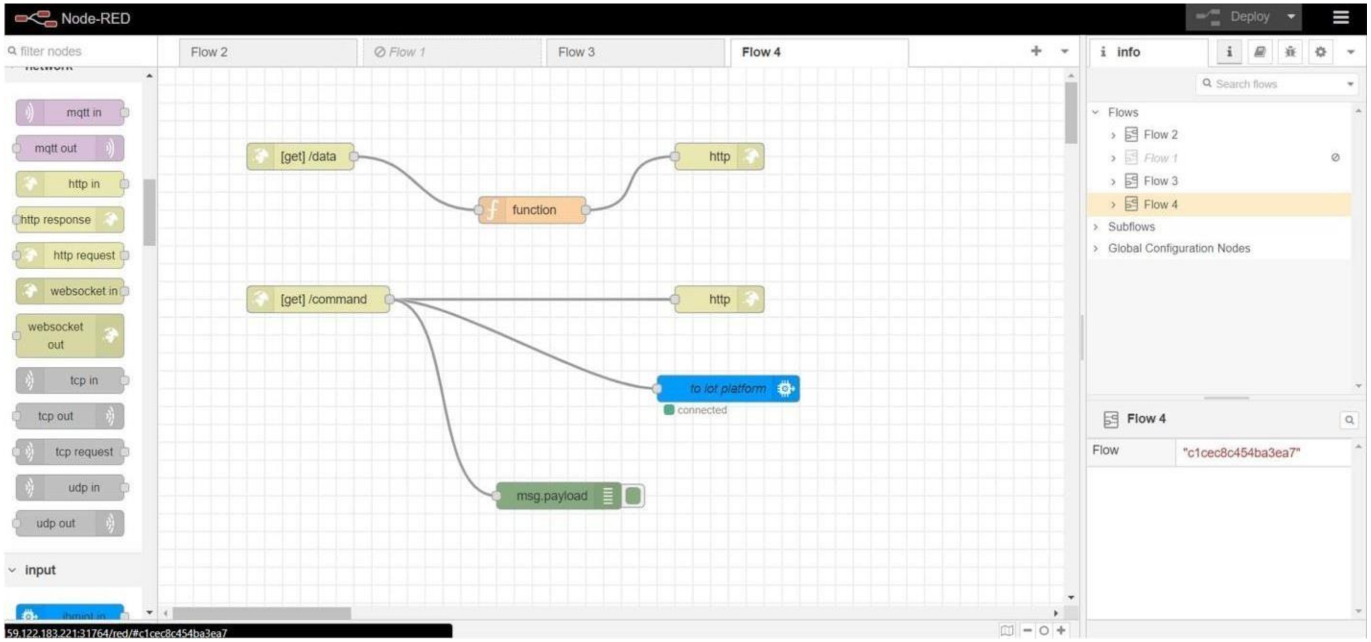
Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
0001	Disconnected	edge-device-1	Device	Nov 5, 2022 8:56 PM	

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
rnd_number	{"Lane_1":5,"Lane_2":83,"Lane_3":30,"Lane_4":...	json	a few seconds ago
rnd_number	{"Lane_1":59,"Lane_2":59,"Lane_3":94,"Lane_4"...	json	a few seconds ago
rnd_number	{"Lane_1":93,"Lane_2":88,"Lane_3":49,"Lane_4"...	json	a few seconds ago
rnd_number	{"Lane_1":2,"Lane_2":61,"Lane_3":21,"Lane_4":...	json	a few seconds ago
rnd_number	{"Lane_1":70,"Lane_2":11,"Lane_3":69,"Lane_4"...	json	a few seconds ago

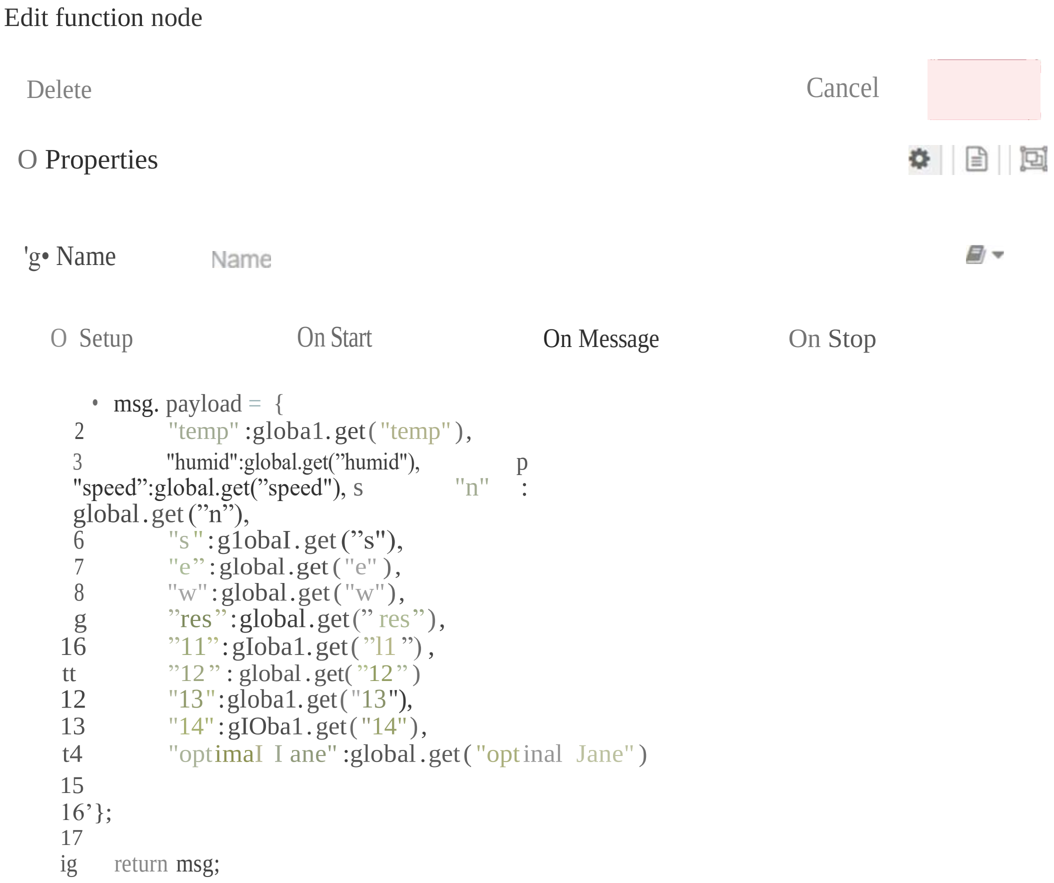
1 Simulation running

Node Red – Connect with MIT AppInventor



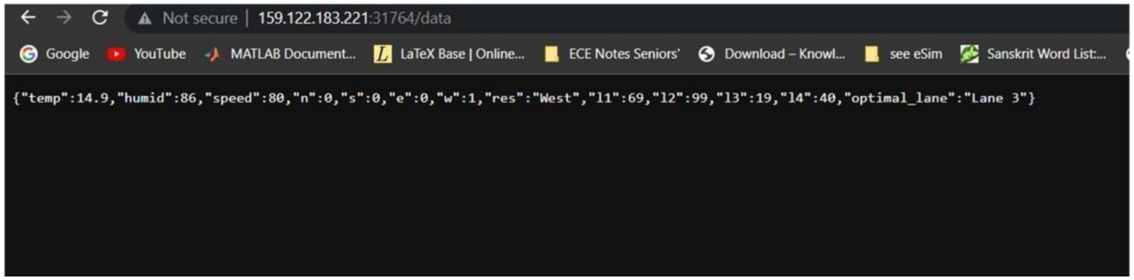
Flow "c1cec8c454ba3ea7"

59.122.183.221:31764/red/#c1cec8c454ba3ea7



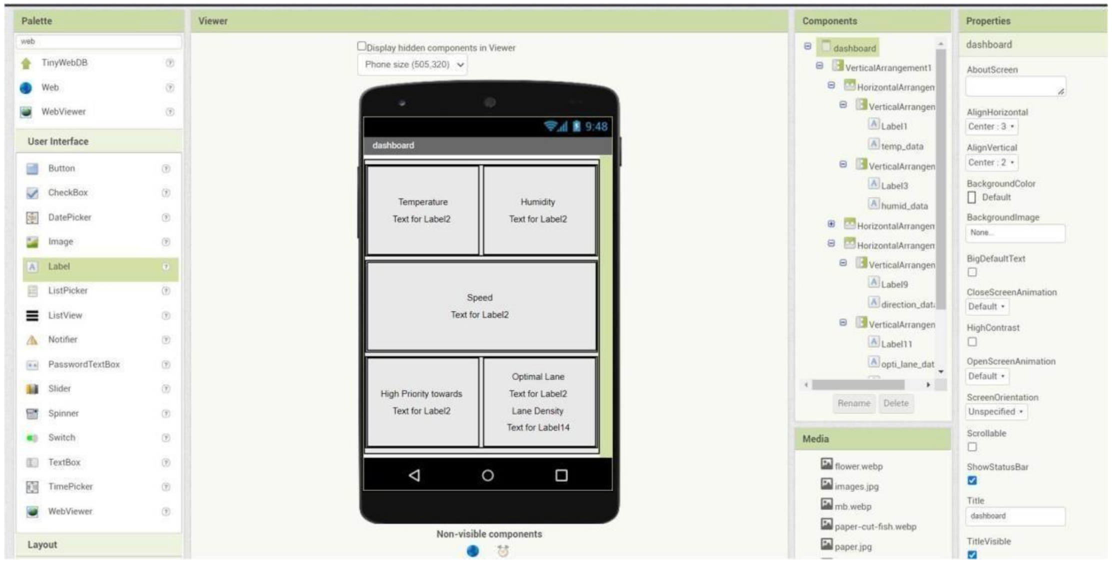
```
msg. payload = {
        "temp" :globa1. get ( "temp" ),
        "humid":global.get(”humid"),              p
"speed”:global.get(”speed"), s           "n"     :
global . get (”n”),
        "s " : g1obaI . get (”s"),
        "e” : global . get ( "e" ) ,
        "w" : global . get ( "w" ),
        ”res ” : global . get (” res ”) ,
        ”11” : gIoba1 . get ( ”l1 ”) ,
        ”12 ” : global . get( ”12 ” )
        "13" : globa1. get ( "13"),
        "14" : gIOba1 . get ( "14" ) ,
        "optimaI I ane" :global . get ( "optinal Jane" )

’};

    return msg;
```

Output from Node red:

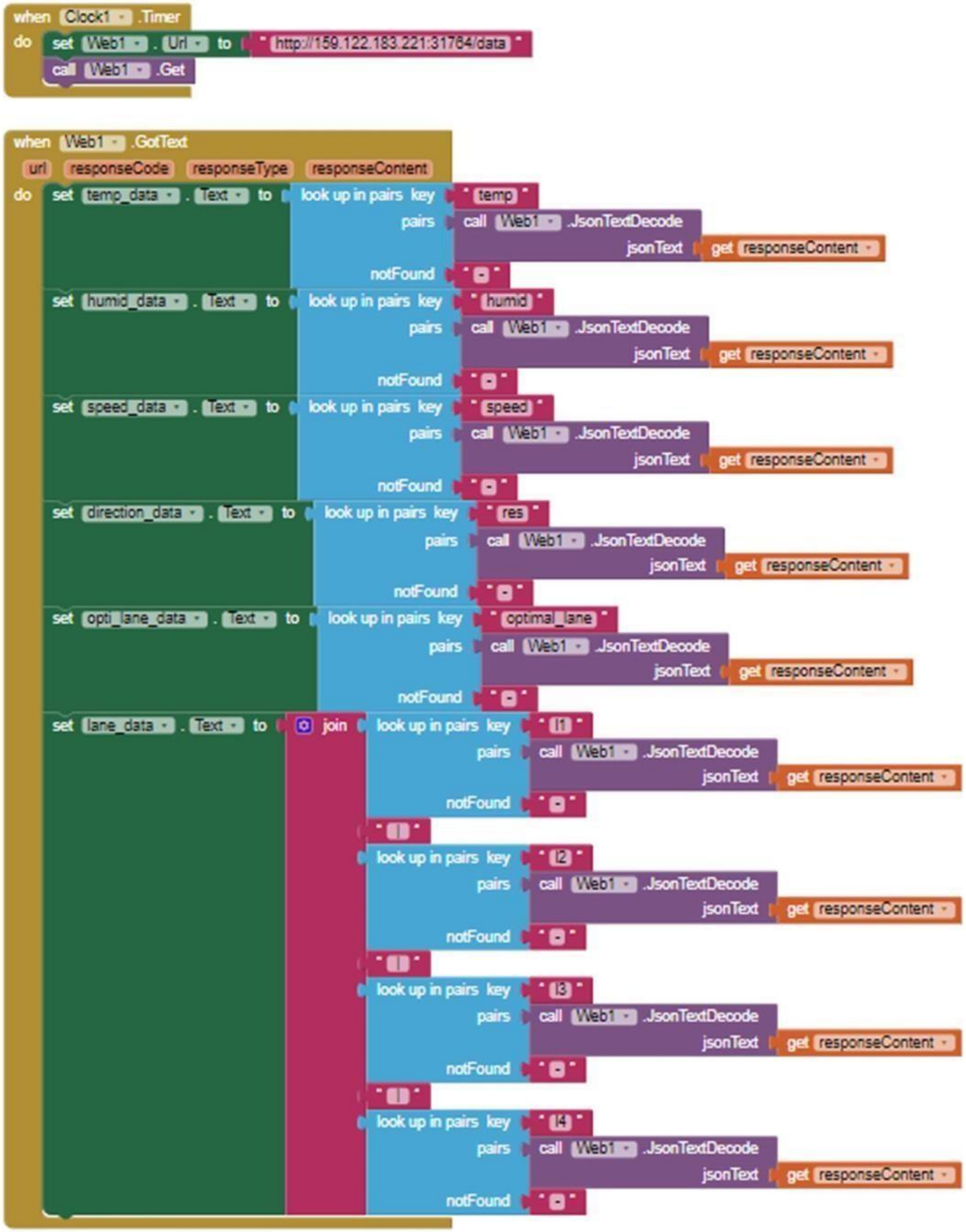


```
{"temp":14.9,"humid":86,"speed":80,"n":0,"s":0,"e":0,"w":1,"res":"West","l1":69,"l2":99,"l3":19,"l4":40,"optimal_lane":"Lane 3"}
```

MIT App Inventor UI design:



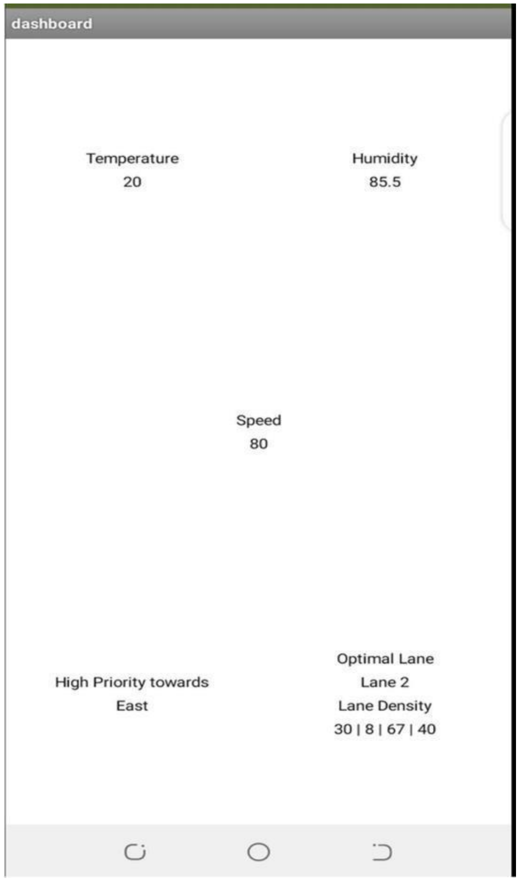
MIT App Inventor Backend design:



```
when Clock1 .Timer
do  set Web1 . Url to " http://159.122.183.221:31764/data "
    call Web1 .Get

when Web1 .GotText
 url  responseCode  responseType  responseContent
do  set temp_data . Text to  look up in pairs  key " temp "
                                              pairs  call Web1 .JsonTextDecode
                                                                      jsonText  get responseContent
                                           notFound " - "
    set humid_data . Text to  look up in pairs  key " humid "
                                               pairs  call Web1 .JsonTextDecode
                                                                       jsonText  get responseContent
                                            notFound " - "
    set speed_data . Text to  look up in pairs  key " speed "
                                               pairs  call Web1 .JsonTextDecode
                                                                       jsonText  get responseContent
                                            notFound " - "
    set direction_data . Text to  look up in pairs  key " res "
                                                   pairs  call Web1 .JsonTextDecode
                                                                           jsonText  get responseContent
                                                notFound " - "
    set opti_lane_data . Text to  look up in pairs  key " optimal_lane "
                                                   pairs  call Web1 .JsonTextDecode
                                                                           jsonText  get responseContent
                                                notFound " - "
    set lane_data . Text to  join  look up in pairs  key " l1 "
                                                   pairs  call Web1 .JsonTextDecode
                                                                           jsonText  get responseContent
                                                notFound " - "
                                   " | "
                                   look up in pairs  key " l2 "
                                                   pairs  call Web1 .JsonTextDecode
                                                                           jsonText  get responseContent
                                                notFound " - "
                                   " | "
                                   look up in pairs  key " l3 "
                                                   pairs  call Web1 .JsonTextDecode
                                                                           jsonText  get responseContent
                                                notFound " - "
                                   " | "
                                   look up in pairs  key " l4 "
                                                   pairs  call Web1 .JsonTextDecode
                                                                           jsonText  get responseContent
                                                notFound " - "
```

Sprint 3 delivery:

(OUTPUT) Display from MIT App:



dashboard

Temperature
20

Humidity
85.5

Speed
80

High Priority towards
East

Optimal Lane
Lane 2
Lane Density
30 | 8 | 67 | 40