

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

Date	14 November 2022
PNT2022TMID00922	PNT2022TMID20032
Project Name	Project – Signs with Smart Connectivity for Better Road Safety
Maximum Marks	8 Marks

Wokwi Simulation: <https://wokwi.com/projects/348216301620036179>

The screenshot displays the Wokwi simulation interface. On the left, the 'sketch.ino' file contains the following code:

```
1 #include <WiFi.h> //library for wifi
2 #include <PubSubClient.h> //library for MQTT
3 #include "DHT.h" // Library for dht11
4 #define DHTPIN 5 // what pin we're connected to
5 #define DHTTYPE DHT22 // define type of sensor DHT 11
6
7 DHT dht (DHTPIN, DHTTYPE); // creating the instance by passing pin and typtr of dht connect
8
9 void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
10
11 //-----credentials of IBM Accounts-----
12
13 #define ORG "psh4py" //IBM ORGANITION ID
14 #define DEVICE_TYPE "alert-device" //Device type mentioned in ibm watson IOT Platform
15 #define DEVICE_ID "4571" //Device ID mentioned in ibm watson IOT Platform
16 #define TOKEN "12345678" //Token
17 String data3;
18 float h, t;
19
20
21 //----- Customise the above values -----
22 char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; // Server Name
23 char publishTopic[] = "iot-2/evt/Data/fmt/json"; // topic name and type of event perform a
24 char subscribetopic[] = "iot-2/cmd/command/fmt/String"; // cmd REPRESENT command type AND
25 char authMethod[] = "use-token-auth"; // authentication method
26 char token[] = TOKEN;
27 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID; //client id
28
29
30 //-----
31 WiFiClient wificlient; // creating the instance for wificlient
32 PubSubClient client(server, 1883, callback, wificlient); //calling the predefined client
33
34
35 void setup() // configureing the ESP32
```

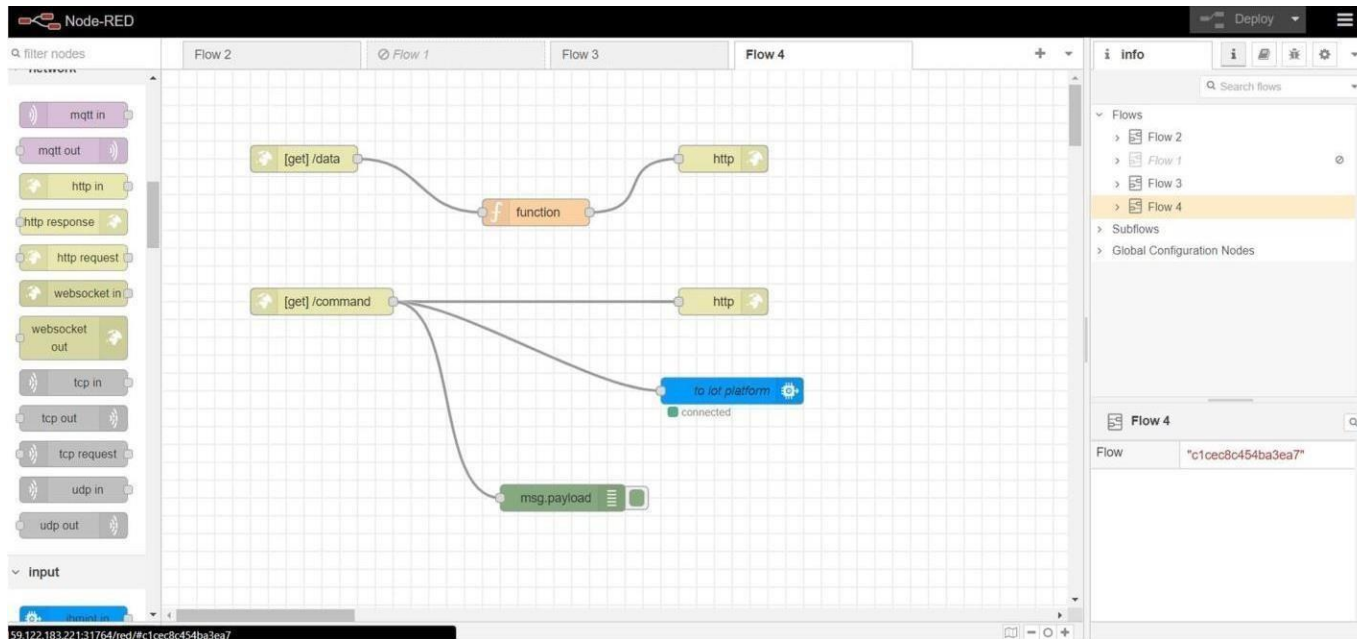
The right pane shows the simulation of the hardware. An ESP32 microcontroller is connected to a DHT22 sensor. The sensor's pins are connected to the ESP32's pins: VCC to 5V, GND to GND, and the data pin to D5. A red switch labeled 'ON' is also visible. The simulation output window shows the following log:

```
{ "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 }
```

The bottom status bar indicates the system temperature is 26°C, mostly cloudy, and the time is 18:36 on 13-11-2022.

IoT Device – IoT Platform





Edit function node

Delete

Cancel

O Properties



'g• Name

Name



O Setup

On Start

On Message

On Stop

```

      • msg. payload = {
2    "temp":global.get ("temp" ) ,
3    "humid":global.get ("humid"), p "speed":global.get ("speed"),

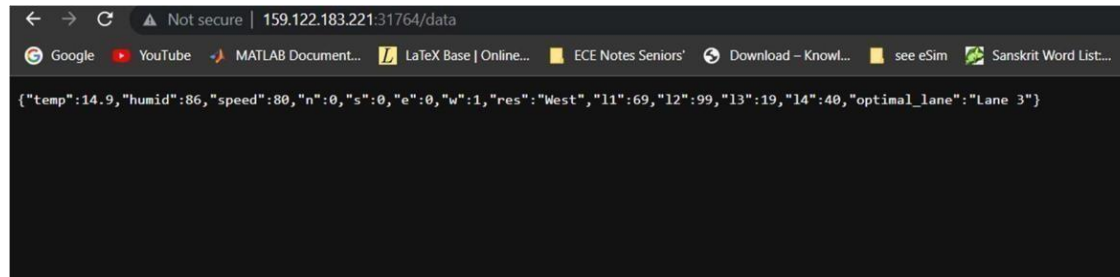
```

```

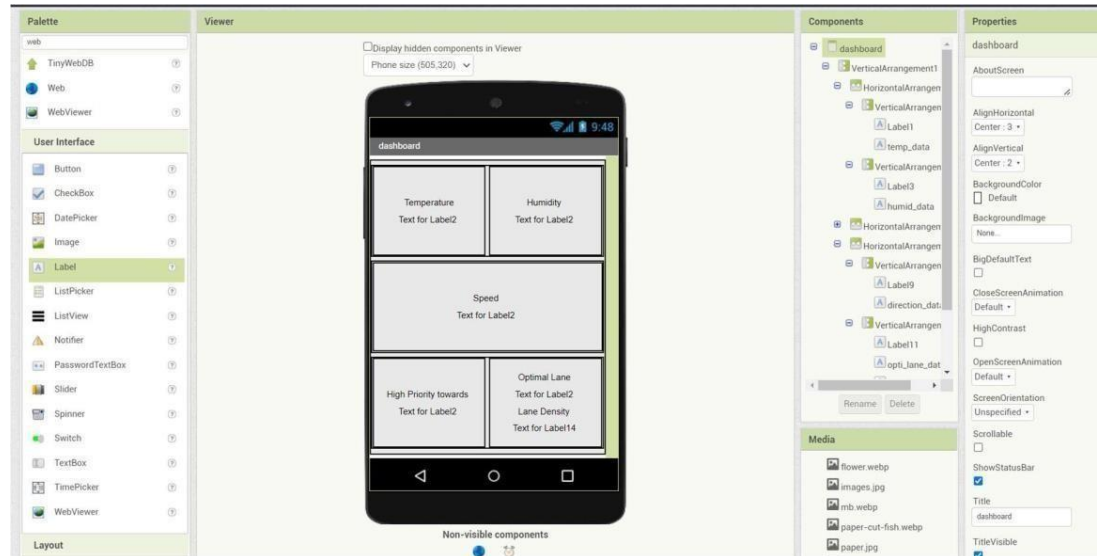
        s "n" : global . get ("n"), 6 "s "
        : global . get ("s"),
        7 "e " : global . get ( "e" ), 8 "w" :
        global . get ( "w" ), g "res " : global
        . get (" res " ), 16 "11" : globa1. get
        ("11 " ), tt "12 " : global . get( "12 " )
12     "13 " : globa1. get ( "13 " ),
13     "14" : glOba1 . get ( "14" ) , t4 "opt imal l ane" :global . get ( "opt inal Jane" )
        15
        16' };
        17 ig return
        msg;

```

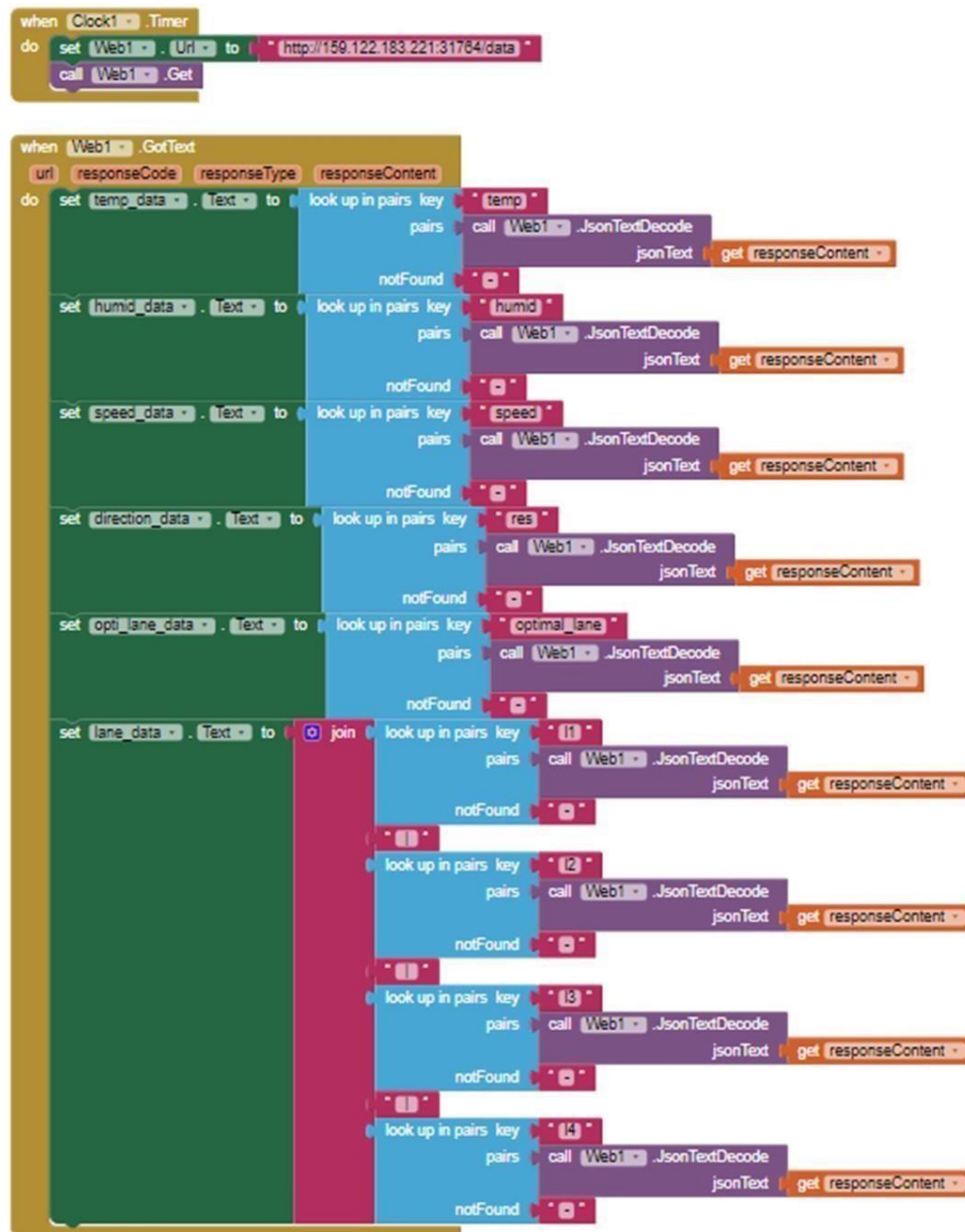
**Output from Node red:**



**MIT App Inventor UI design:**



**MIT App Inventor Backend design:**



**Sprint 3 delivery:**

**(OUTPUT) Display from MIT App:**

Temperature  
20

Humidity  
85.5

Speed  
80

High Priority towards  
East

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

