

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

Date	7 November 2022
Team ID	PNT2022TMID41539
Project Name	Project – Signs with Smart Connectivity for Better Road Safety
Maximum Marks	8 Marks

Wokwi Simulation: <https://wokwi.com/projects/348178332935782994>

The screenshot displays the Wokwi web-based IDE interface. The top navigation bar includes the Wokwi logo, a 'SAVE' button, a 'SHARE' button, the project name 'final_iot.ino copy', and a 'Docs' link. The main workspace is divided into three sections: 'sketch.ino' (code editor), 'diagram.json' (circuit diagram), and 'libraries.txt' (library list). The 'sketch.ino' section 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 typr 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
```

The 'diagram.json' section shows a circuit diagram of an ESP32 microcontroller connected to a DHT22 temperature and humidity sensor. The 'Simulation' section displays the execution progress, including a play button, a stop button, and a pause button. The simulation time is 01:47.514, and the battery level is 98%.

The output window shows the following log messages:

```
temp:37.40
humidity:86.00
Sending payload:
{"temp":37.40,"humidity":86.00,"North":0,"South":0,"East":0,"West":0}
Publish ok
Reconnecting client to psh4py.messaging.internetofthings.ibmcloud.com
.....
```

The bottom status bar shows the system clock as 08:23 on 13-11-2022, the temperature as 23°C, and the weather as Cloudy.

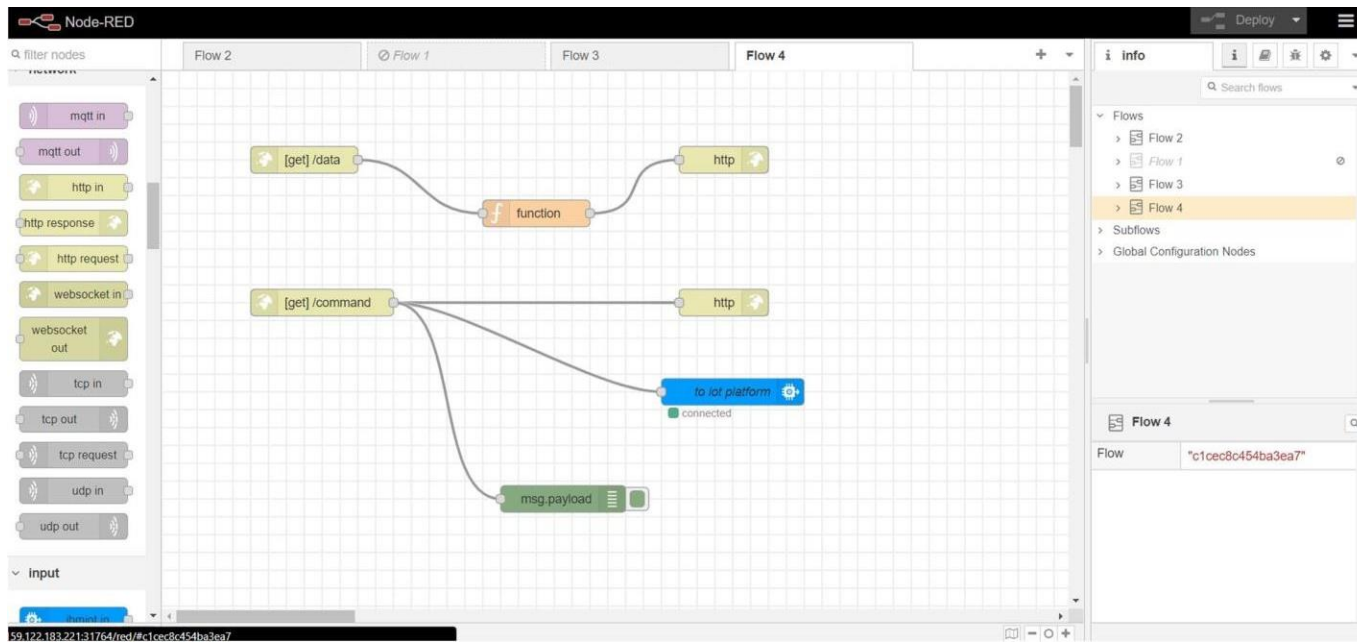
IoT Device – IoT Platform

The screenshot displays the 'Recent Events' tab for a device with ID 0001. The interface includes a top navigation bar with 'Browse', 'Action', 'Device Types', and 'Interfaces'. A sidebar on the left contains various icons for navigation. The main content area shows a table of recent events, each represented as a JSON object with lane data. A status bar at the bottom right indicates '1 Simulation running'.

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



Edit function node

Delete

Cancel

Done

Properties

Name

Name

Setup

On Start

On Message

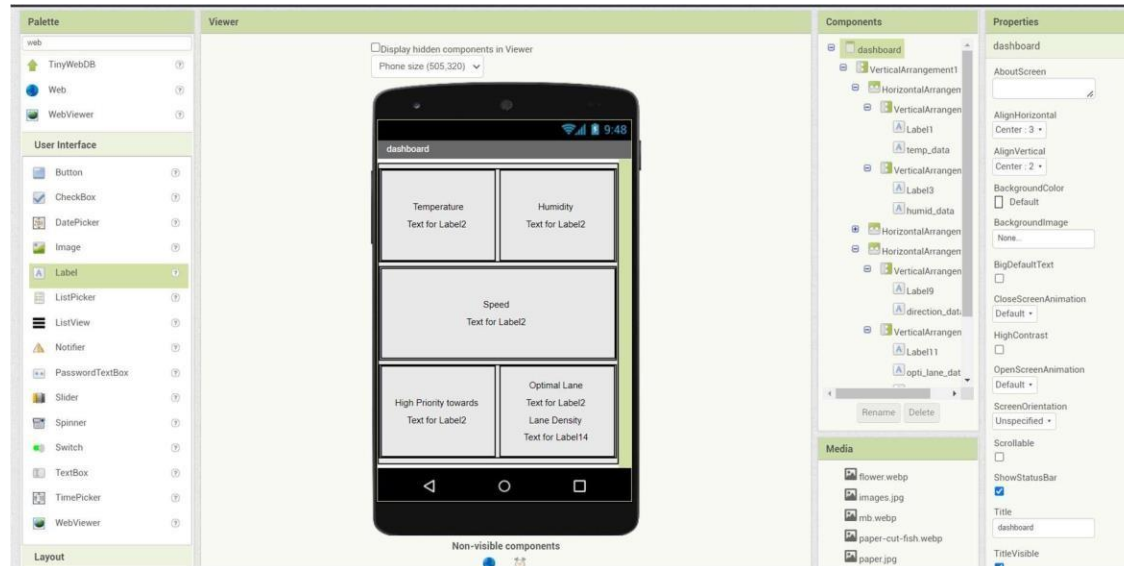
On Stop

```
1 msg.payload = {  
2   "temp":global.get("temp"),  
3   "humid":global.get("humid"),  
4   "speed":global.get("speed"),  
5   "n":global.get("n"),  
6   "s":global.get("s"),  
7   "e":global.get("e"),  
8   "w":global.get("w"),  
9   "res":global.get("res"),  
10  "l1":global.get("l1"),  
11  "l2":global.get("l2"),  
12  "l3":global.get("l3"),  
13  "l4":global.get("l4"),  
14  "optimal_lane":global.get("optimal_lane")  
15 };  
16 ^};  
17  
18 return msg;
```

Output from Node red:

```
← → ↻ Not secure | 159.122.183.221:31764/data
Google YouTube MATLAB Document... LaTeX Base | Online... ECE Notes Seniors' Download - Knowl... see eSim Sanskrit Word List...
{"temp":14.9,"humid":86,"speed":80,"n":0,"s":0,"e":0,"w":1,"res":"West","11":69,"12":99,"13":19,"14":40,"optimal_lane":"Lane 3"}
```

MIT App Inventor UI design:



```

when Clock1 -> Timer
do
  set Web1 -> Uri to http://159.122.183.221:31784/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

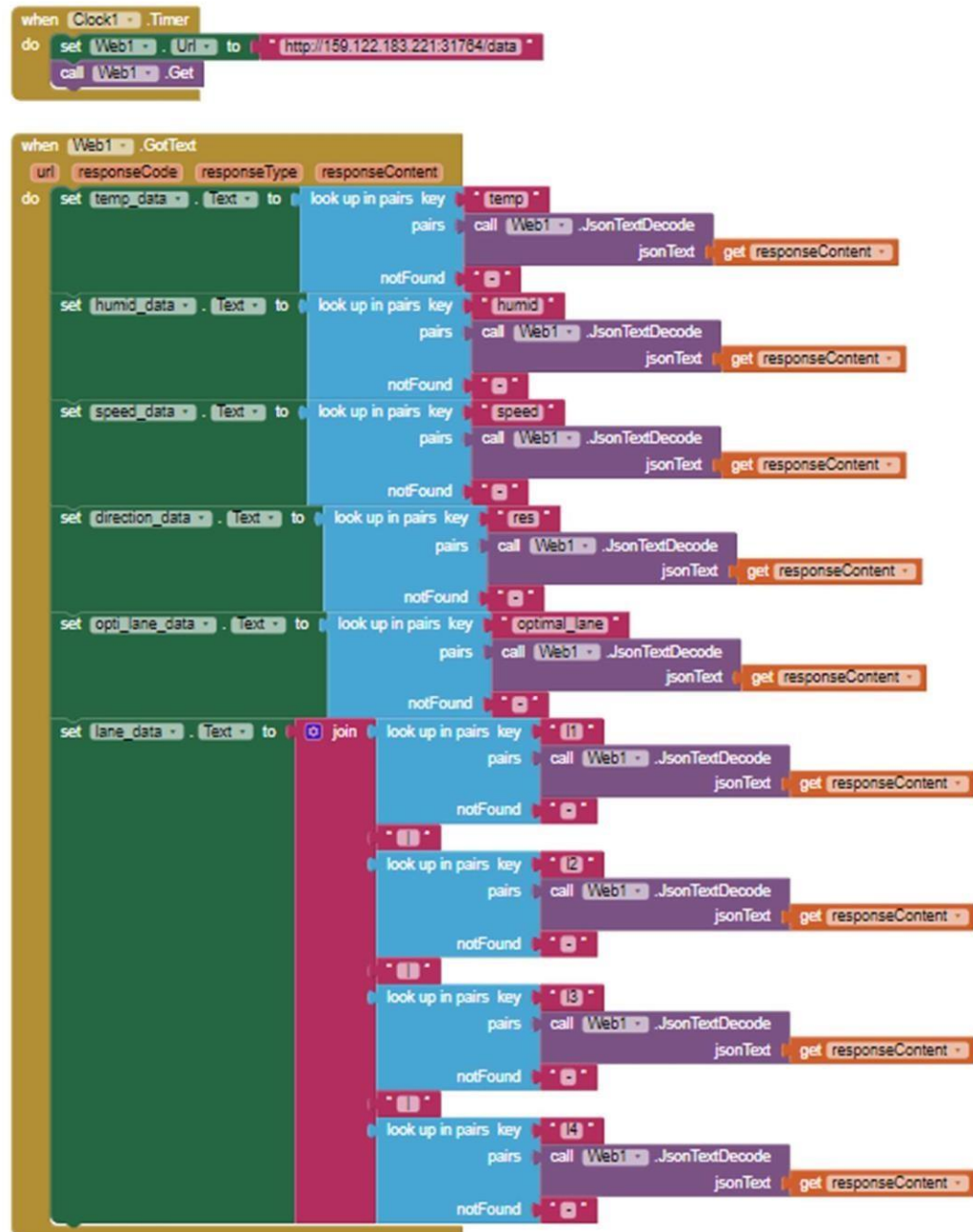
  set opt_lane_data -> Text to look up in pairs key optimal_lane
  pairs call Web1 -> JsonTextDecode
  jsonText get responseContent
  notFound

  set lane_data -> Text to join
  look up in pairs key 1
  pairs call Web1 -> JsonTextDecode
  jsonText get responseContent
  notFound

  look up in pairs key 2
  pairs call Web1 -> JsonTextDecode
  jsonText get responseContent
  notFound

  look up in pairs key 3
  pairs call Web1 -> JsonTextDecode
  jsonText get responseContent
  notFound

  look up in pairs key 4
  pairs call Web1 -> JsonTextDecode
  jsonText get responseContent
  notFound
  
```



Sprint 3 delivery:

(OUTPUT) Display from MIT App:

