

Develop a Web Application Using Node-Red Service

Date	17 November 2022
Team ID	PNT2022TMID47485
Project Name	Signs With Smart Connectivity For better Road Safety
Maximum marks	20 Marks

The screenshot shows the IBM Cloud dashboard interface. At the top, there's a navigation bar with 'IBM Cloud' and a search bar. Below the navigation bar is a sidebar with various icons. The main area is titled 'Dashboard'. On the left, there's a 'Build' section with a blue gradient background and text about exploring IBM Cloud services. To the right, there are four cards: 'Set up your IBM Cloud account', 'Build a web app with Watson Speech to Text', 'Explore tutorials', and another card partially visible. A user profile menu is open on the right side, showing options like 'Profile', 'Log in to CLI and API', 'Privacy', 'Change theme', and 'Logout'. At the bottom, there are tabs for 'User access', 'Manage users', 'News' (which is selected), 'View all', 'Planned maintenance', and 'View'.

IBM Watson IoT Platform x +

internetofthings.ibmcloud.com

IBM Watson IoT Platform

③ 910019106040@student... ?

ID: (select org)

The diagram illustrates the data flow process. On the left, a cloud icon is connected to a series of lines that lead to a central box labeled "Equipment". Below this box, there are two main paths: one leading to a file folder icon and another leading to a smartphone icon. The path to the smartphone is labeled "and make value from it". The bottom of the diagram features a "Learn More" button with a downward arrow.

Collect data from

Equipment

and make value from it

Learn More

Cookie Preferences

Type here to search

20:55 07-11-2022 ENG

Service Details - IBM Cloud X IBM Watson IoT Platform X +

bmwoyw.internetofthings.ibmcloud.com/dashboard/devices/browse

IBM Watson IoT Platform

910019106040@student.autmdu.in
ID: bmwoyw

Browse Action Device Types Interfaces Add Device +

Browse Devices

All Devices Diagnose

This table shows a summary of all devices that have been added. It can be filtered, organized, and searched on using different criteria. To get started, you can add devices by using the Add Device button, or by using API.

<input type="checkbox"/>	Device ID	Status	Device Type	Class ID	Date Added
> <input type="checkbox"/>	PNT2022TMID47485	Disconnected	PNT2022TMID47485	Device	Nov 2, 2022 12:06 AM
> <input type="checkbox"/>	PNT2022TMID47485-1	Disconnected	PNT2022TMID47485-1	Device	Nov 2, 2022 12:37 AM

Items per page 50 | 1–2 of 2 items

1 Simulation running

Search by Device ID Device Simulator  

Type here to search       16:42 07-11-2022 ENG

Resource list - IBM Cloud IBM Watson IoT Platform Node-RED

bmwoyw.internetofthings.ibmcloud.com/dashboard/apps/browse/add

IBM Watson IoT Platform 910019106040@student.autmdu.in
ID: bmwoyw

Browse IBM Cloud Apps

The API key has been added.

Authentication tokens are non-recoverable. If you misplace this token, you will need to re-register the API key to generate a new authentication token.

Generated Details		API Key Information	
API Key	a-bmwoyw-zmz8axzche	Description	-
Authentication Token	h4JInR*Hb*RHehQmLh	Role	Standard Application
		Expires	Never

⚠ Make a note of the generated authentication token.
Lost authentication tokens cannot be recovered. If you lose the token, you must reregister the API to generate a new token.

[View API Key](#) [Add Another](#) [Close](#)

1 Simulation running

Type here to search

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bmwoyy.internetofthings.ibmcloud.com/dashboard/devices/drilldown/PNT2022TMID47485:PNT2022TMID47485?returnTo=/devices/browse

IBM Watson IoT Platform

Device Drilldown - PNT2022TMID47485

Recent Events

The recent events listed show the live stream of data

Event	Value
event_1	{"temperature":18,"humidity":5}
event_1	{"temperature":18,"humidity":2}
event_1	{"temperature":100,"humidity":7}
event_1	{"temperature":53,"humidity":7}
event_1	{"temperature":60,"humidity":5}

Simulations

1/50 Simulations Running

+ New Simulation

Device Type: PNT2022TMID47485

1 Device

PNT2022TMID47485

1 x Create Simulated Device Use Registered Device

Type here to search

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bmwoyw.internetofthings.ibmcloud.com/dashboard/devices/drilldown/PNT2022TMID47485:PNT2022TMID47485?returnTo=/devices/browse

Device Drilldown - PNT2022TMID47485

Recent Events

The recent events listed show the live stream of data

Event	Value
event_1	{"temperature":8,"humidity":92}
event_1	{"temperature":20,"humidity":55}
event_1	{"temperature":66,"humidity":45}
event_1	{"temperature":47,"humidity":55}
event_1	{"temperature":45,"humidity":25}

Device Type: PNT2022TMID47485

Events 1

New event type +

Event type name: event_1

Schedule: 20 Every Minute

Payload:

```
0 {
1   "temperature": random(0, 100),
2   "humidity": random(0, 100),
3   "rain": random(0,100)
4 }
5
```

Upload a CSV file

Cancel Save

Type here to search

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bmwoyw.internetofthings.ibmcloud.com/dashboard/devices/drilldown/PNT2022TMID47485:PNT2022TMID47485?returnTo=/devices/browse

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910019106040@student.autmdu.in
ID: bmwoyw

Device Drilldown - PNT2022TMID47485

Connection Information

- Recent Events
- State
- Device Information
- Metadata
- Diagnostics
- Connection Logs
- Device Actions

Recent Events

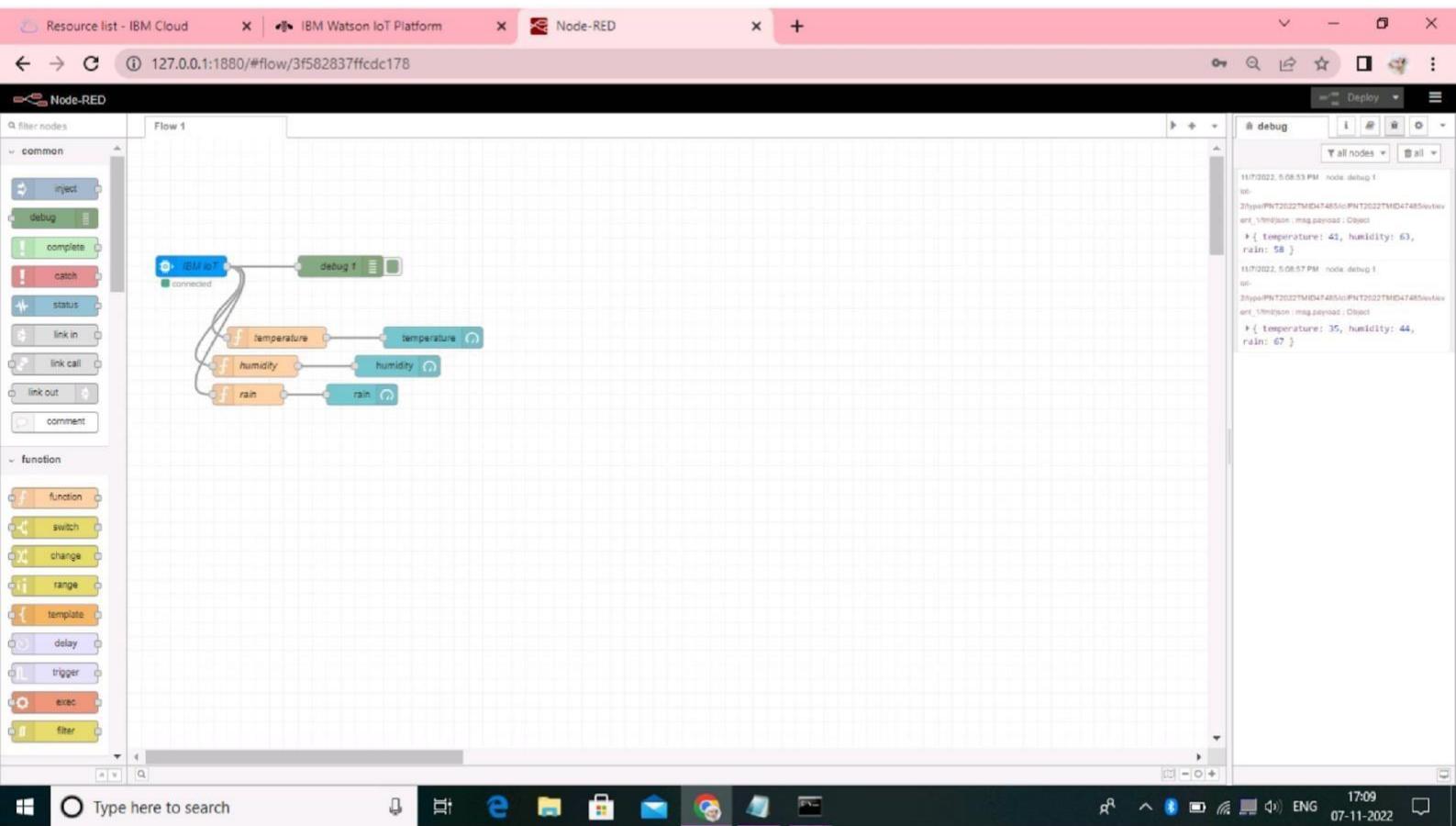
The recent events listed show the live stream of data that is coming and going from this device.

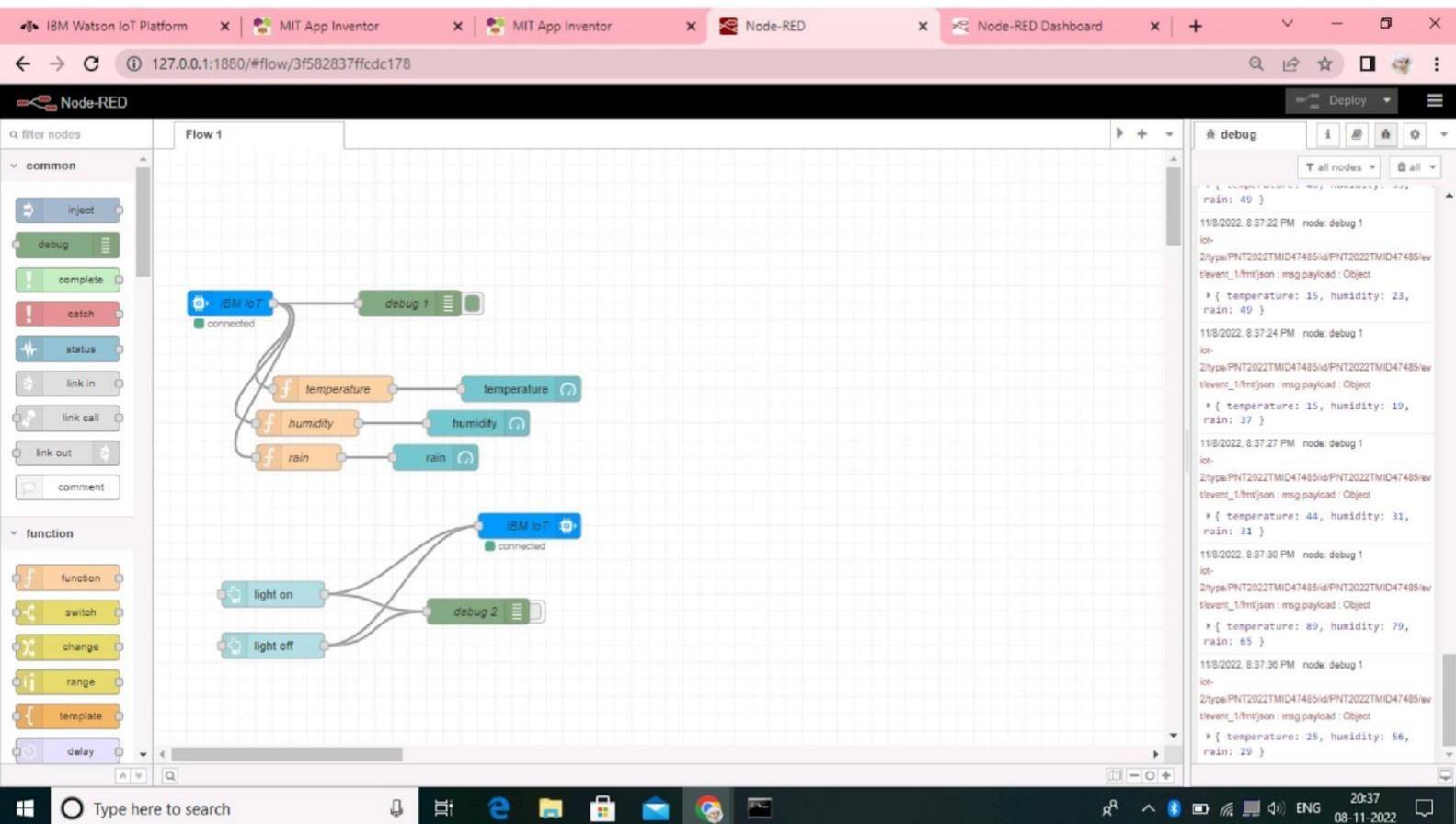
Event	Value	Format	Last Received
event_1	{"temperature":12,"humidity":63,"rain":69}	json	a few seconds ago
event_1	{"temperature":68,"humidity":30,"rain":44}	json	a few seconds ago
event_1	{"temperature":97,"humidity":28,"rain":0}	json	a few seconds ago
event_1	{"temperature":47,"humidity":12,"rain":70}	json	a few seconds ago
event_1	{"temperature":16,"humidity":3,"rain":4}	json	a few seconds ago

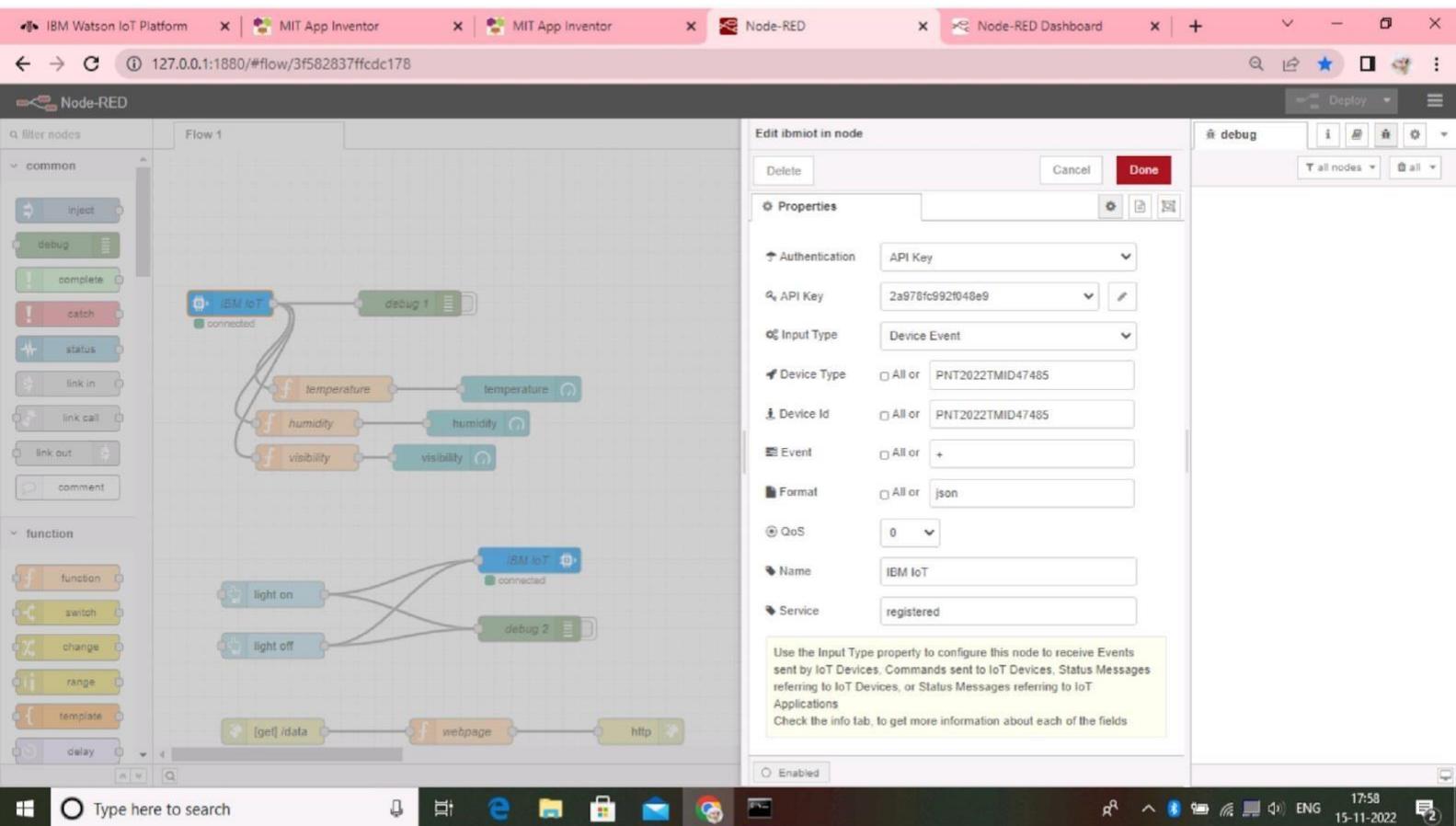
1 Simulation running

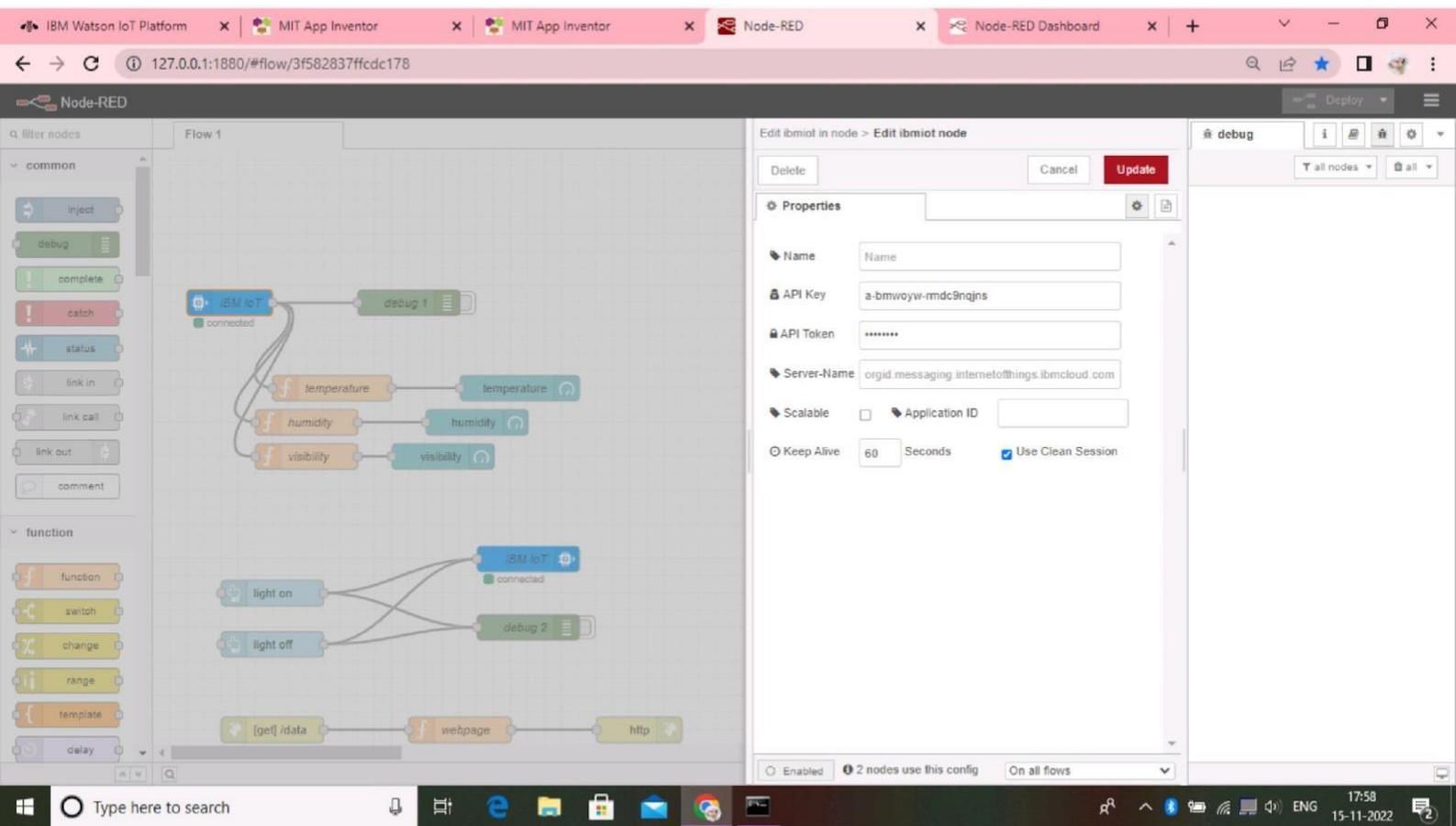
Type here to search

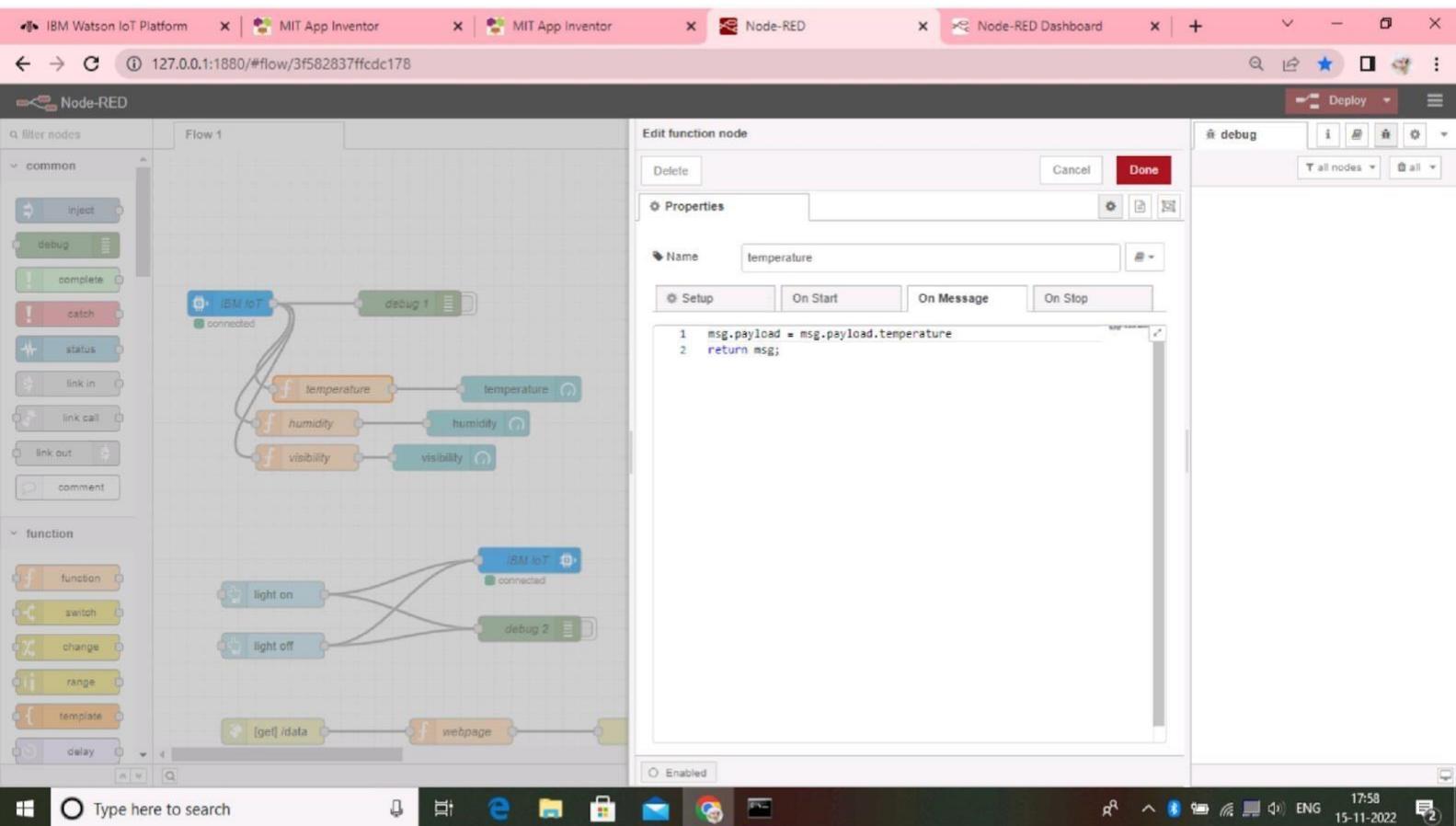
21:07 07-11-2022

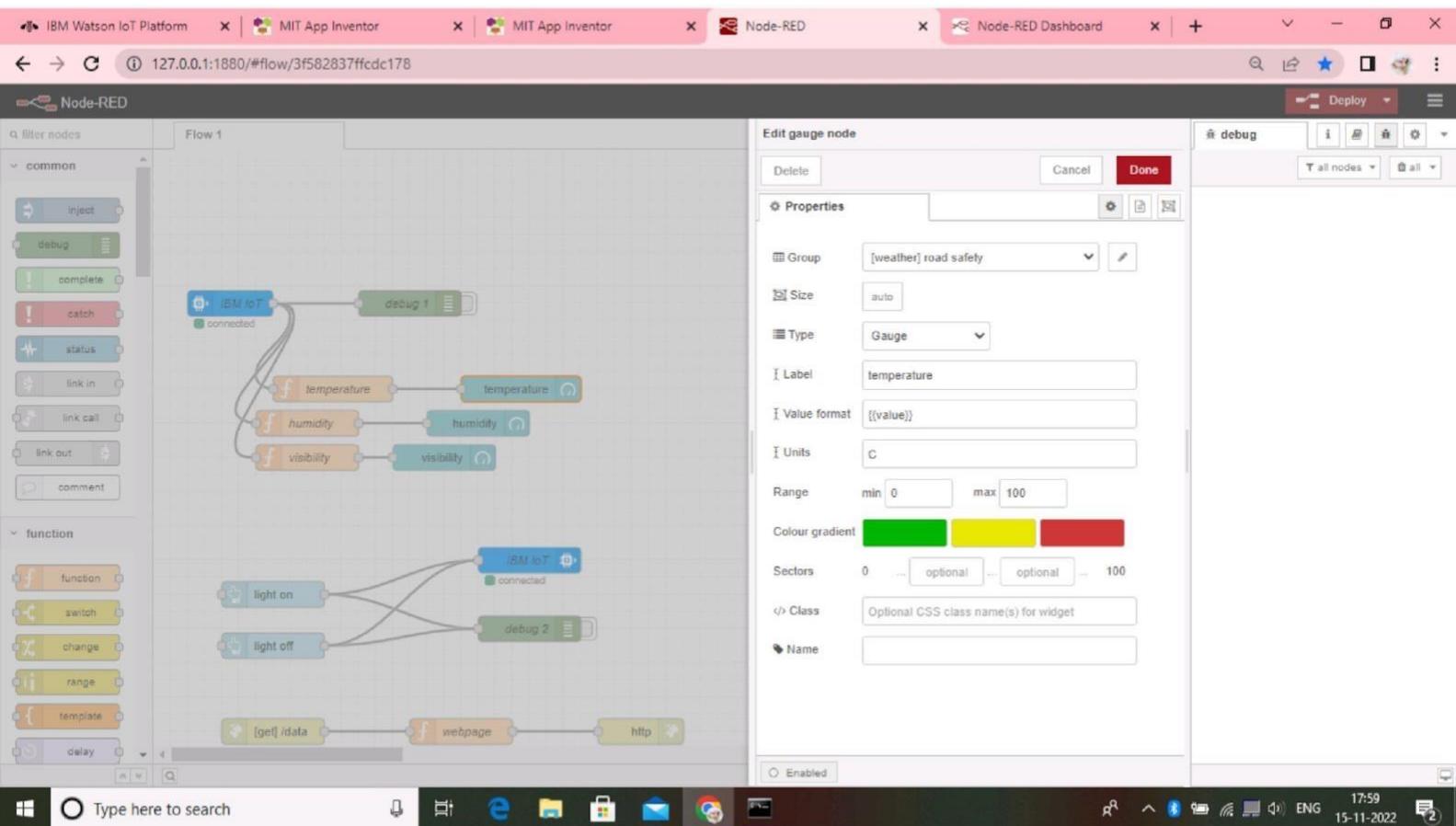


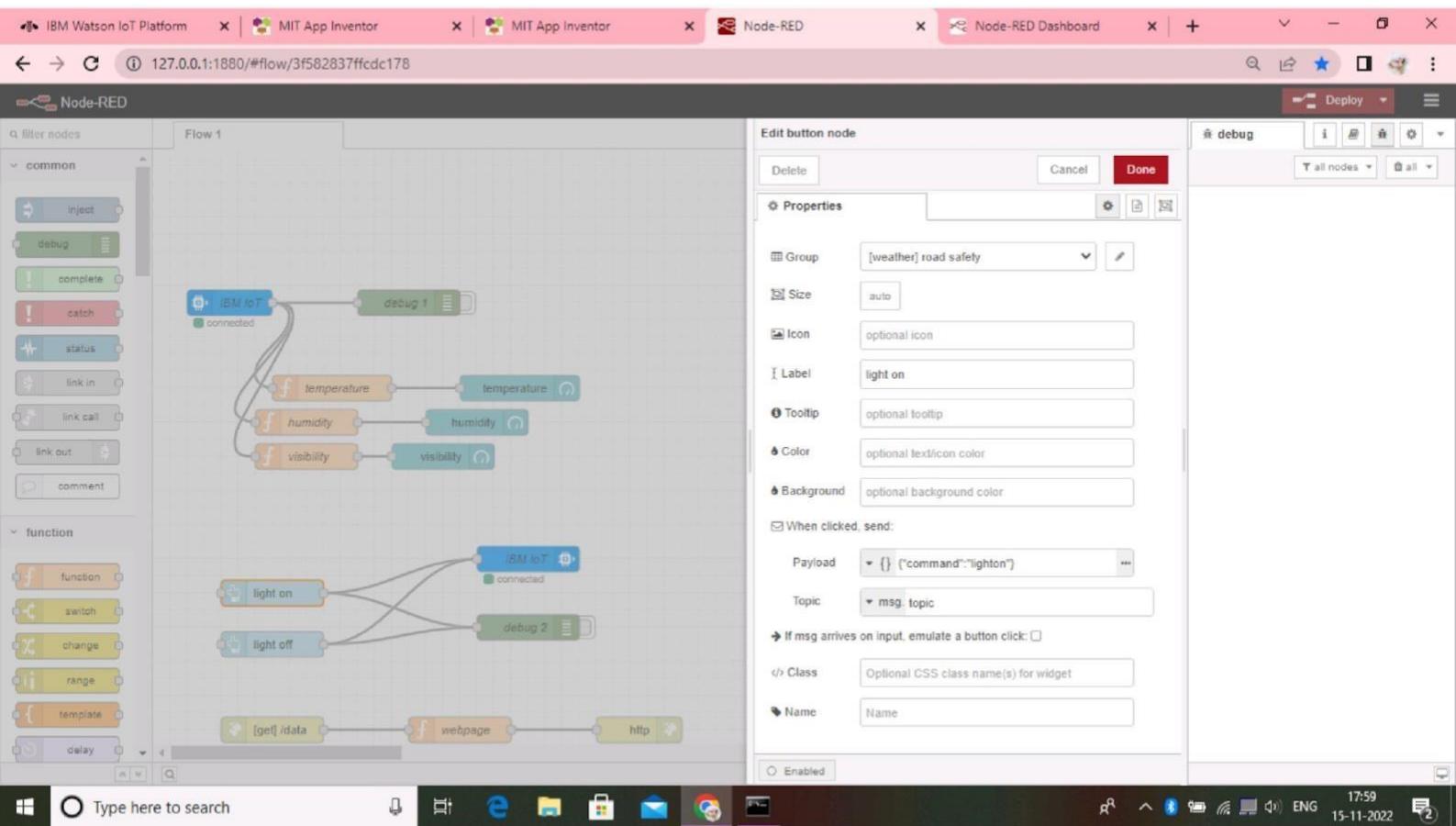


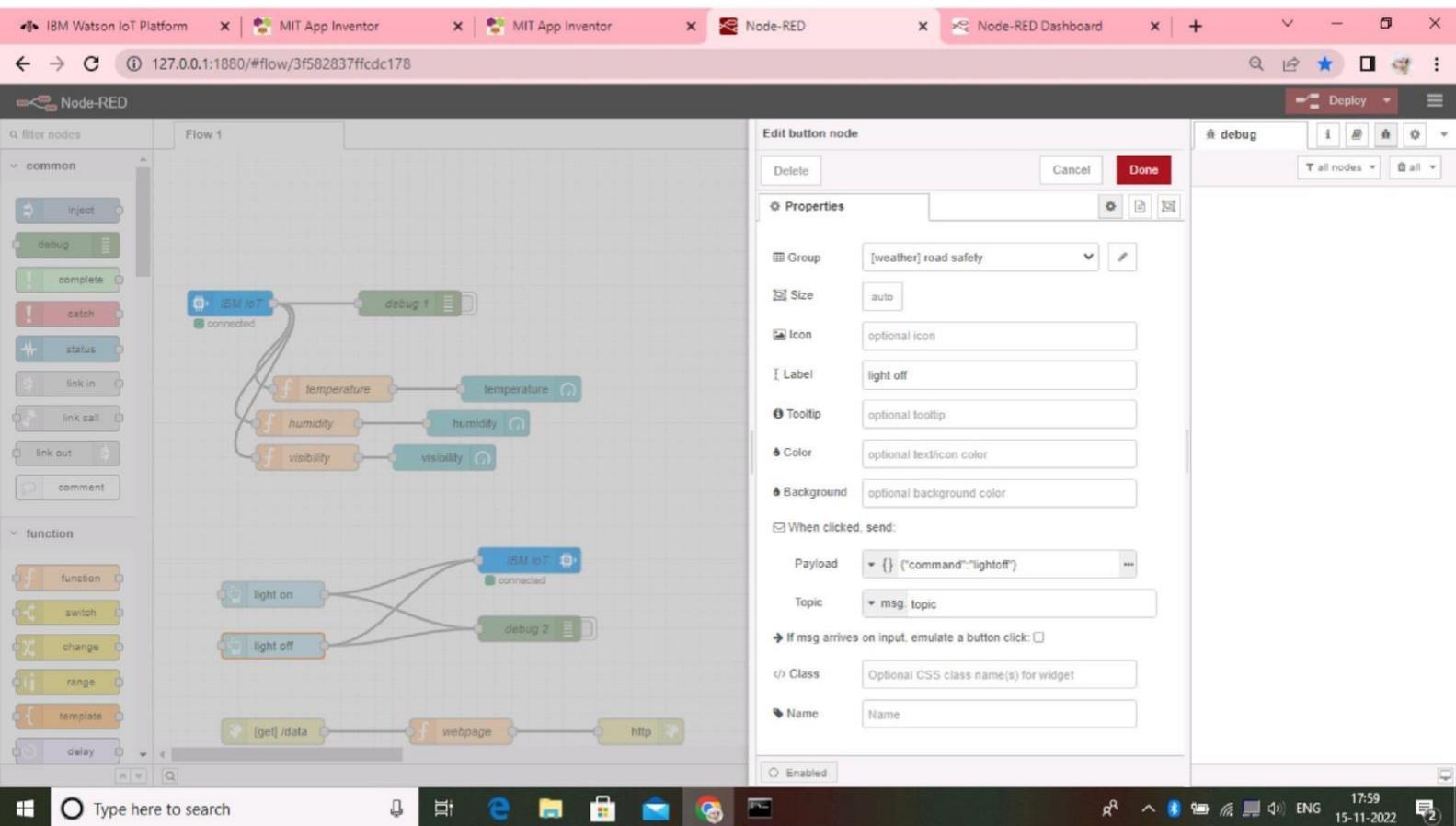












New Tab | Node-RED | ibmcloud login | IBM Watson IoT | MIT App Inventor | MIT App Inventor | Node-RED Dash | + | - | X

localhost:1880/ui/#/0?socketid=VHpljVTle_3hyqvNAAAB

weather

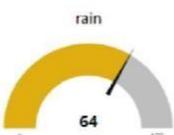
road safety

humidity



53

rain



64

LIGHT ON

LIGHT OFF

temperature



6

Type here to search

20:25 07-11-2022

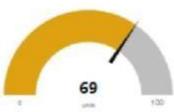
New Tab | Node-RED | ibmcloud login | IBM Watson IoT | MIT App Inventor | MIT App Inventor | Node-RED Dash | + | - | X

localhost:1880/ui/#/0?socketid=VHpljVTle_3hyqvNAAAB

weather

road safety

humidity



69

0 100

rain



36

0 100

LIGHT ON
LIGHT OFF

temperature



34

0 100

Type here to search

20:25 07-11-2022

IBM Watson IoT Platform | Node-RED | mit app inventor - Google Search | +

google.com/search?q=mit+app+inventor&rlz=1C1FKPE_enIN950IN950&oq=&aqs=chrome.0.35i39i362i8.3318448558j0j15&sourceid=chrome&ie=UTF-8

Google mit app inventor

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<https://appinventor.mit.edu>

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MIT APP INVENTOR

App Inventor for Android

Computer program

MIT App Inventor is a web application integrated development environment originally provided by Google, and now maintained by the Massachusetts Institute of Technology. [Wikipedia](#)

Initial release date: 15 December 2010

Operating system: Android

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SIGNS_WITH_SMART_CONNECTIVITY_FOR_BETTER_ROAD_SAFETY Screen1 Add Screen... Remove Screen Publish to Gallery

Designer Blocks

Palette Search Components...

User Interface

- Button
- CheckBox
- DatePicker
- Image
- Label
- ListView
- Notifier
- PasswordTextBox
- Slider
- Spinner
- Switch
- TextBox
- TimePicker
- WebView

Layout Media Drawing and Animation Maps Charts

Screen1

Display hidden components in Viewer Phone size (505,320)

Screen1

Screen1

Properties

AppName SIGNS_WITH_SMART_CO

AccentColor Default

AlignHorizontal Left : 1

AlignVertical Top : 1

BackgroundColor Default

BackgroundImage None...

BigDefaultText

BlocksToolkit All

CloseScreenAnimation Default

DefaultFileScope App

HighContrast

Icon None...

OpenScreenAnimation Default

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SIGNS_WITH_SMART_CONNECTIVITY_FOR_BETTER_ROAD_SAFETY Screen1 Add Screen... Remove Screen Publish to Gallery

Palette

User Interface

Layout

Media

Drawing and Animation

Maps

Charts

Sensors

AccelerometerSensor

BarcodeScanner

Barometer

Clock

GyroscopeSensor

Hygrometer

LightSensor

LocationSensor

MagneticFieldSensor

NearField

OrientationSensor

Pedometer

ProximitySensor

Thermometer

Viewer

Display hidden components in Viewer
Phone size (505,320)

Screen

9:48

Non-visible components

Web1 Web2 Clock1

Components

Screen1

Web1

Web2

Clock1

Properties

TimerAlwaysFires

TimerEnabled

TimerInterval

1000

Design Blocks

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SIGNS_WITH_SMART_CONNECTIVITY_FOR_BETTER_ROAD_SAFETY Screen1 Add Screen... Remove Screen Publish to Gallery Design Blocks

Palette Search Components...

User Interface

- Button
- CheckBox
- DatePicker
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- PasswordTextBox
- Slider
- Spinner
- Switch
- TextBox
- TimePicker
- WebViewer

Layout

Media

Drawing and Animation

Maps

Charts

Viewer

Display hidden components in Viewer
Phone size (505,320)

Screen

9:48

Non-visible components

Web1 Web2 Clock1

Components

- Screen
- HorizontalArrangement1
- HorizontalArrangement2
- HorizontalArrangement3
- HorizontalArrangement4
- Web1
- Web2
- Clock1

Properties

TextBox1

BackgroundColor Default

Enabled

FontBold

FontItalic

FontSize 14.0

FontTypeface default

Height Automatic

Width Automatic

Hint Hint for TextBox1

MultiLine

NumbersOnly

ReadOnly

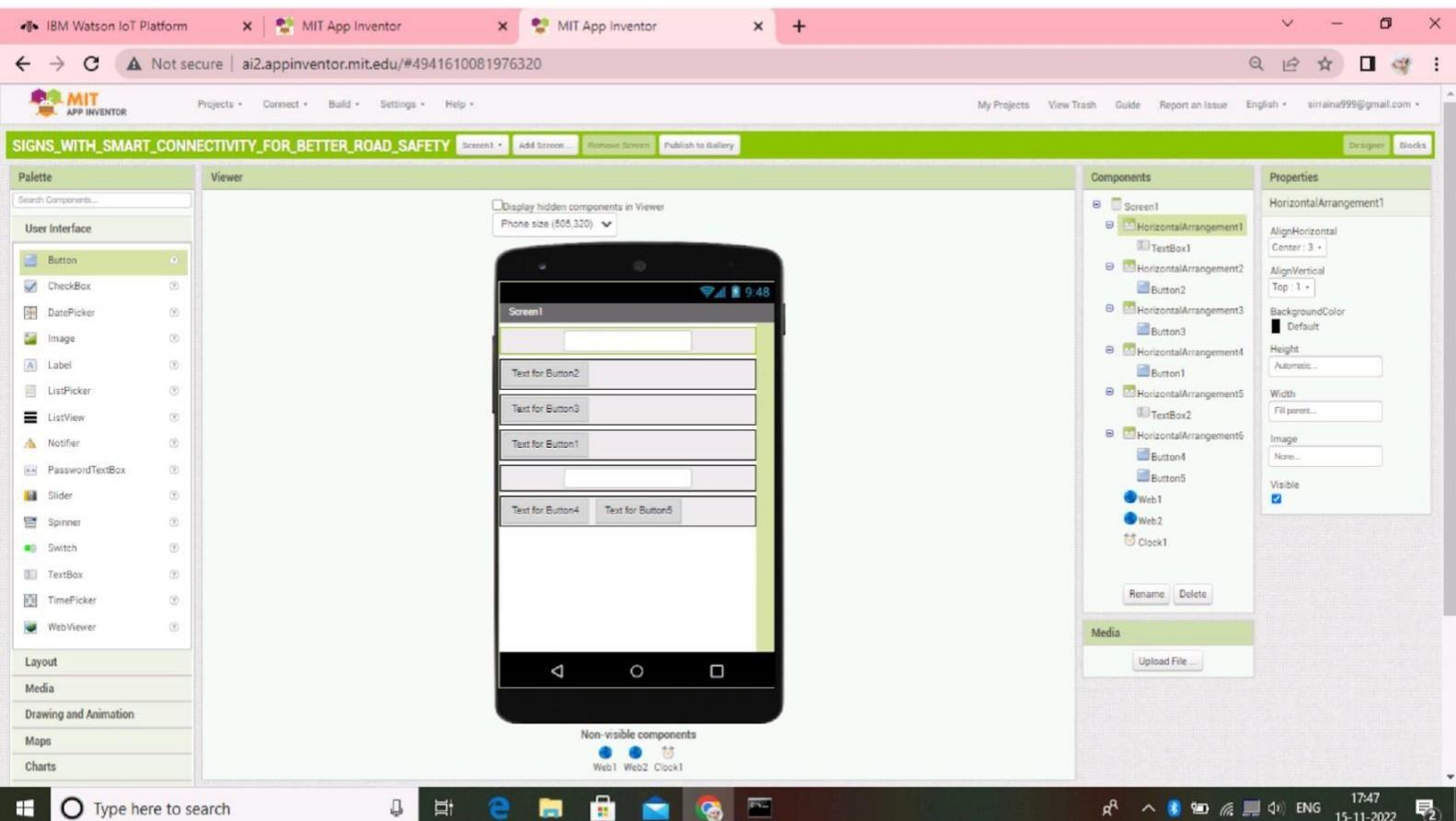
Text

TextAlignment left: 0 *

Type here to search

17:44 ENG 15-11-2022

The screenshot shows the MIT App Inventor Designer interface. A mobile screen is displayed in the center, showing a grid of components. The first row has two buttons: a large green one and a smaller pink one. The subsequent three rows each have a single large pink button. To the right of the screen, the Properties panel is open for a 'TextBox1' component. It includes fields for BackgroundColor (set to 'Default'), Enabled (checked), FontBold (unchecked), FontItalic (unchecked), FontSize (set to 14.0), FontTypeface (set to 'default'), Height (set to 'Automatic'), Width (set to 'Automatic'), Hint (set to 'Hint for TextBox1'), MultiLine (unchecked), NumbersOnly (unchecked), ReadOnly (unchecked), Text (empty), and TextAlignment (set to 'left: 0 *').



IBM Watson IoT Platform | MIT App Inventor | MIT App Inventor

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The screenshot shows the MIT App Inventor interface with a project titled "ai2.appinventor.mit.edu/#4941610081976320". The central area displays a smartphone screen with a user interface for "SMART ROAD SAFETY". The screen has a title bar "SMART ROAD SAFETY", a "TEMPERATURE" button, a "HUMIDITY" button (which is highlighted in green), and a "Text for Button1" label. Below these are several empty text input fields. The right side of the interface shows the component tree and properties for the "HUMIDITY" button. The component tree includes "HorizontalArrangement3", "Button3", "HorizontalArrangement4", "Button1", "HorizontalArrangement5", "TextBox2", "HorizontalArrangement6", "TextBox3", "TextBox4", "Web1", "Web2", and "Clock1". The properties panel shows "Text" set to "HUMIDITY" and "Visible" checked. The left sidebar lists various components like DatePicker, Image, Label, etc., with "TextBox" selected. A bottom navigation bar includes links for Privacy Policy and Terms of Use.

IBM Watson IoT Platform | MIT App Inventor | MIT App Inventor

Not secure | ai2.appinventor.mit.edu/#4941610081976320

The screenshot shows the MIT App Inventor interface with a project titled "SMART ROAD SAFETY". The main workspace displays a smartphone screen with four cards: "TEMPERATURE", "HUMIDITY", "RAIN", and "CONTROL". The "CONTROL" card contains two buttons: "LIGHT ON" and "LIGHT OFF". The properties panel on the right is set for the "CONTROL" card, showing the following configuration:

- Text: CONTROL
- TextAlignment: left: 0
- TextColor: Pink
- Visible: checked

The left sidebar lists various components: DatePicker, Image, Label, ListView, Notifier, PasswordTextBox, Slider, Spinner, Switch, TextBox (selected), TimePicker, and WebViewer.

Non-visible components listed in the workspace:

- Web1
- Web2
- Clock1

Bottom navigation bar: Privacy Policy and Terms of Use, Windows logo, search bar, taskbar icons (File Explorer, Edge, Mail, Google Chrome, File Manager), system tray (Speaker, Network, Battery, Volume, Language, Date/Time).

IoT-B1-1M3E (Evening) | IBM Watson IoT Platform | Node-RED : 169.51.206.102:30859 | IBM Cloud | Node-RED Dashboard | MIT App Inventor | MIT App Inventor | Update

Not Secure | ai2.appinventor.mit.edu/#4753699575300096

MIT APP INVENTOR

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Designer Blocks

Signs_with_Smart_Connectivity_for_Better_Road_Safety [Screen1]

Blocks Viewer

Built-in

- Control
- Logic
- Math
- Text**
- Lists
- Dictionaries
- Colors
- Variables
- Procedures

Screen1

- HorizontalArrangement1
- Label1
- HorizontalArrangement2
- Label2
- TextBox1
- HorizontalArrangement3
- Label3

Rename Delete

Media

Upload File ...

Show Warnings

when Clock1 .Timer
do set Web1 . Url to

Privacy Policy and Terms of Use

IoT-B1-1M3E (Evening) | IBM Watson IoT Platform | Node-RED : 169.51.206.102:30859 | IBM Cloud | Node-RED Dashboard | MIT App Inventor | MIT App Inventor | Update

Not Secure | 169.51.206.102:30859/red/#flow/f9f308d8a3dd88b1

Node-RED

Flow 1

```

graph LR
    IoT((IBM IoT)) -- "msg.payload connected" --> Temp[Temperature node]
    IoT -- "msg.payload connected" --> Hum[Humidity node]
    IoT -- "msg.payload connected" --> Vis[Visibility node]
    Temp --> Http[http]
    Hum --> Http
    Vis --> Http
    Http --> LightON[Light ON]
    LightON --> LightOFF[Light OFF]
    LightOFF --> LightON

```

Edit http in node

Properties

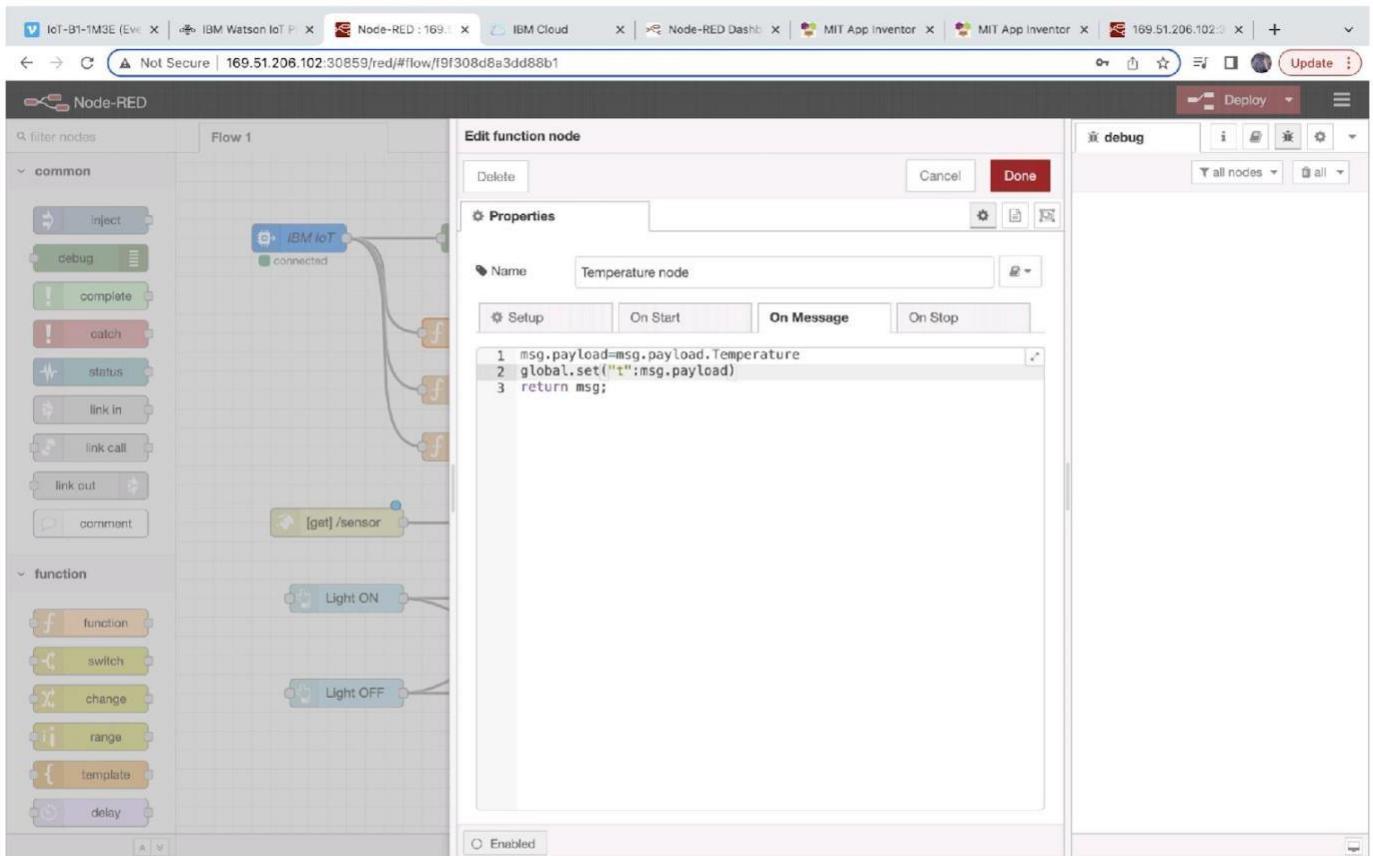
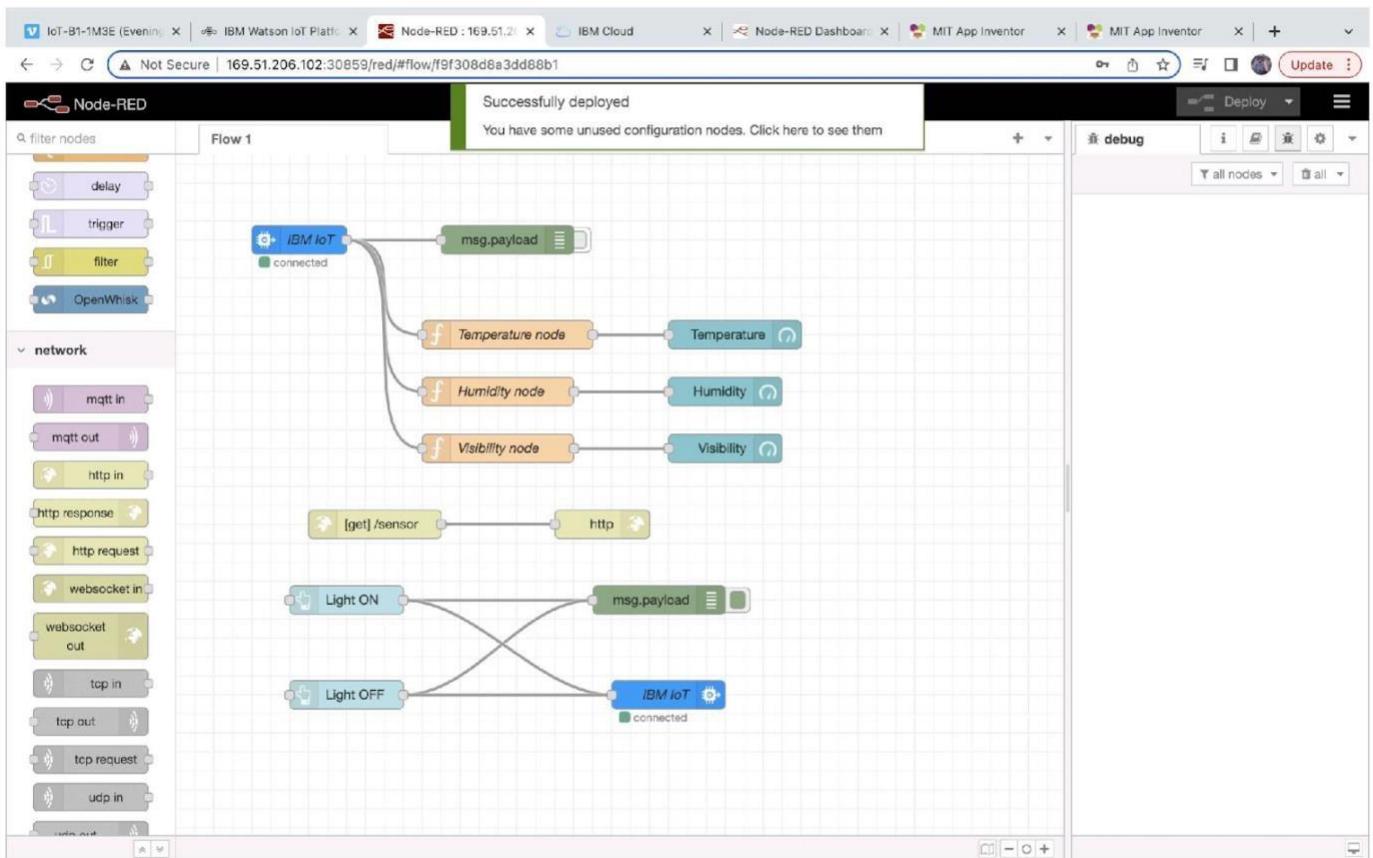
Method: GET

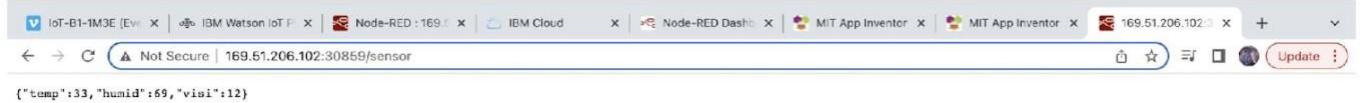
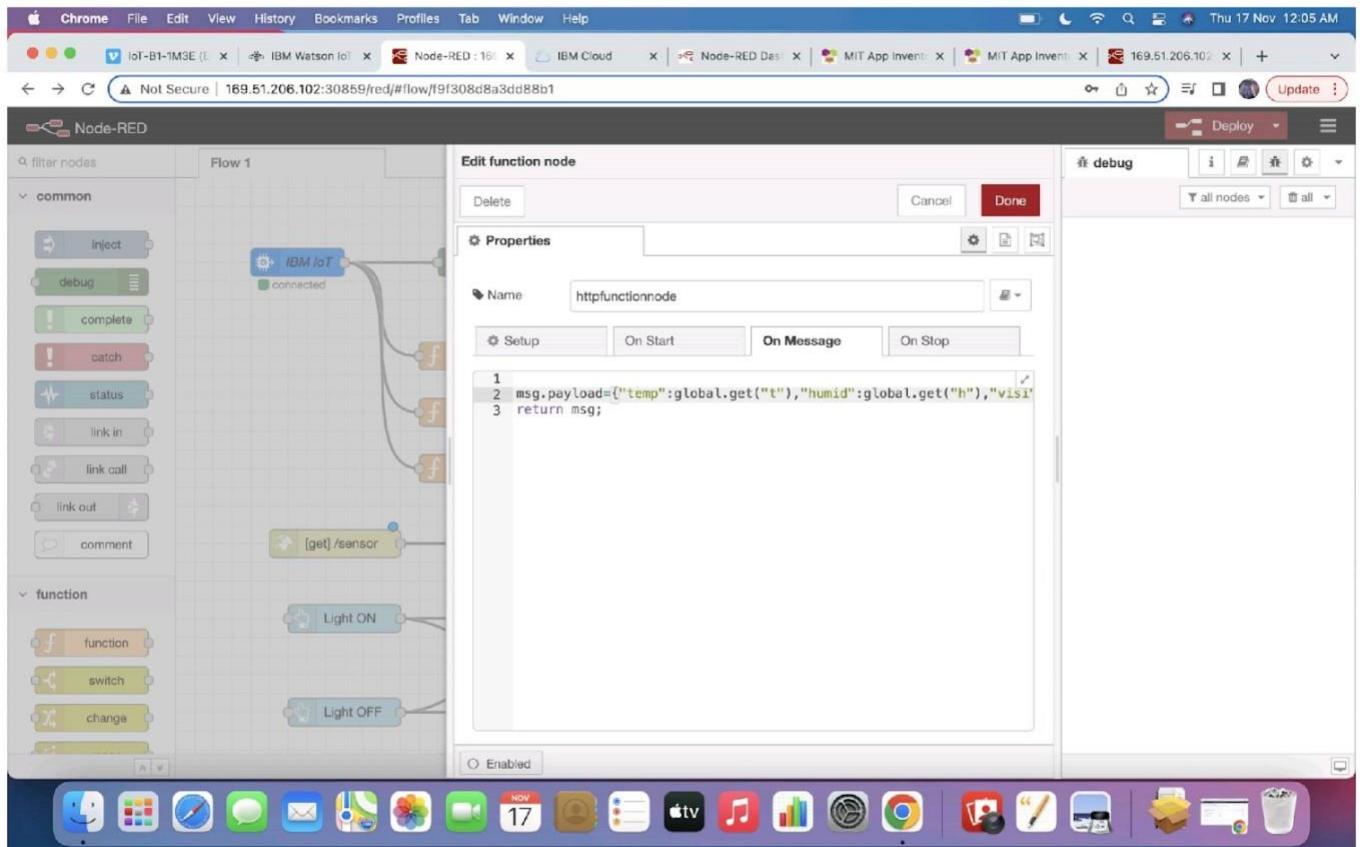
URL: /sensor

Name: Name

Enabled

debug





IoT-B1-1M3E (Mo) | IBM Watson IoT P | Node-RED : 169. | IBM Cloud | Node-RED Dashb | MIT App Inventor | MIT App Inventor | 169.51.206.102: | +

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Signs_with_Smart_Connectivity_for_Better_Road_Safety

Screen1 Add Screen ... Remove Screen Publish to Gallery Designer Blocks

Blocks

- HorizontalArrangement2
 - Label2
 - TextBox1
- HorizontalArrangement3
 - Label3
 - TextBox2
- HorizontalArrangement4
 - Label4
 - TextBox3
- HorizontalArrangement5
 - Label5
- HorizontalArrangement6
 - Button1
 - Button2
- Web1
- Web2
- Clock1
- Any component

Rename Delete

Viewer

```

when Clock1 .Timer
do set Web1 .Url to "http://169.51.206.102:30859/sensor"
call Web1 .Get

when Web1 .GotText
url responseCode responseType responseContent
do set TextBox1 .Text to [lock up in pairs key temp]
pairs notFound "not found"
call Web1 .JsonTextDecode jsonText get responseContent
set TextBox2 .Text to [lock up in pairs key humid]
pairs notFound "not found"
call Web1 .JsonTextDecode jsonText get responseContent
set TextBox3 .Text to [lock up in pairs key visi]
pairs notFound "not found"
call Web1 .JsonTextDecode jsonText get responseContent
  
```

0 0 Show Warnings

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IoT-B1-1M3E (Mo) | IBM Watson IoT P | Node-RED : 169. | IBM Cloud | Node-RED Dashb | MIT App Inventor | MIT App Inventor | 169.51.206.102: | +

Not Secure | 169.51.206.102:30859/red/#flow/f9f30Bd8a3cd88b1

Node-RED Deploy

Signs

filter nodes

Blocks

- switch
- change
- range
- template
- delay
- trigger
- filter
- OpenWhisk
- network
 - mqtt in
 - mqtt out
 - http in
 - http response
 - http request
 - websocket in
 - websocket out
 - tcp in
- Any

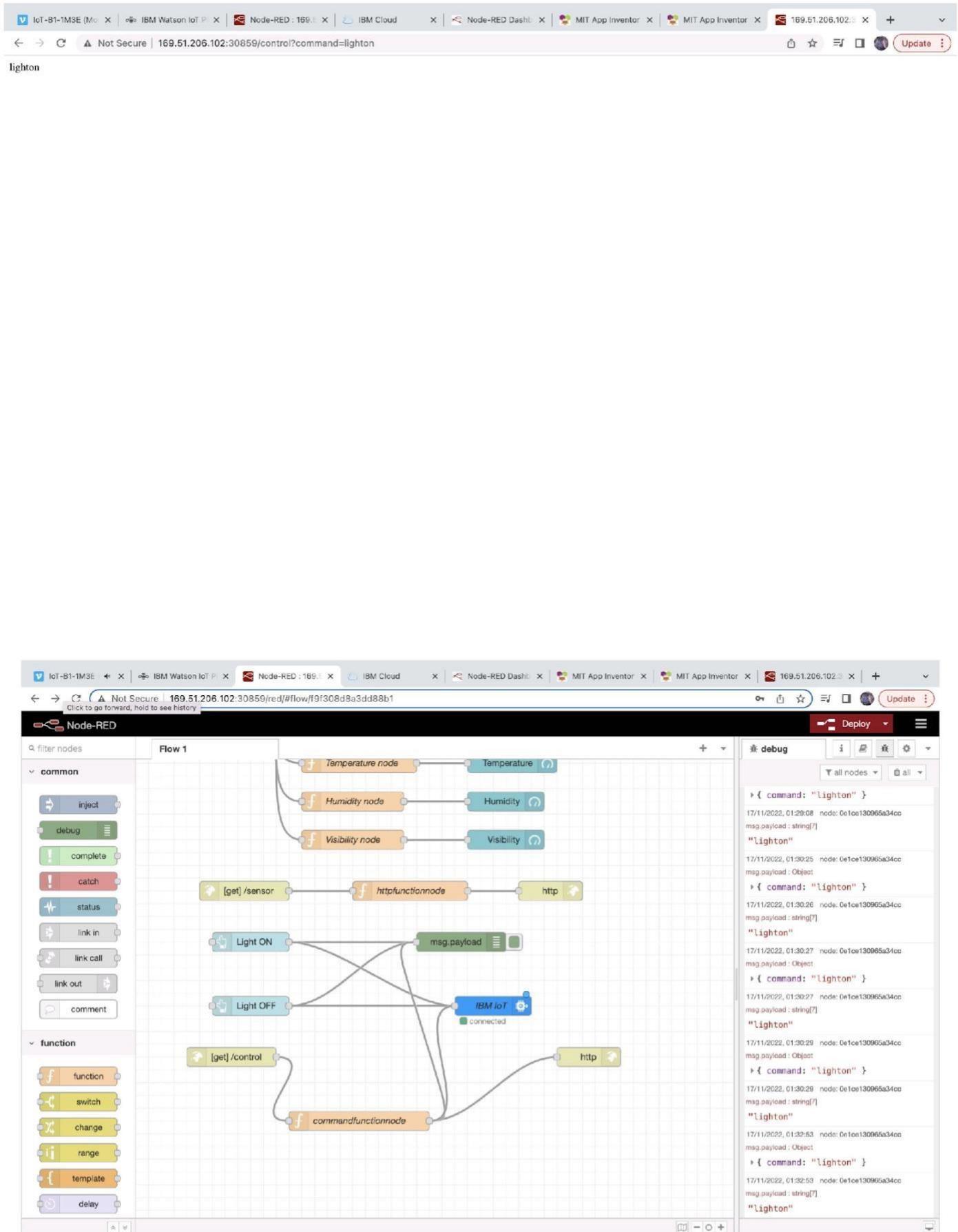
Flow 1

```

graph TD
    IoT[IBM IoT] -- connected --> msgPayload1[msg.payload]
    msgPayload1 --> rangeNode[range node]
    rangeNode --> temperatureNode[Temperature node]
    rangeNode --> humidityNode[Humidity node]
    rangeNode --> visibilityNode[Visibility node]
    temperatureNode -- Temperature --> debugTemp[debug]
    humidityNode -- Humidity --> debugHumidity[debug]
    visibilityNode -- Visibility --> debugVisibility[debug]
    
    httpGet1[[get] /sensor] --> httpFunction1[httpfunctionnode]
    httpFunction1 --> http1[http]
    
    lightON[Light ON] --> msgPayload2[msg.payload]
    lightOFF[Light OFF] --> msgPayload3[msg.payload]
    msgPayload2 --> IoT
    msgPayload3 --> IoT
    
    httpGet2[[get] /control] --> http2[http]
  
```

Media

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Signs_with_Smart_Connectivity_for_Better_Road_Safety Screen1 Add Screen ... Remove Screen Publish to Gallery Designer Blocks

Blocks

- HorizontalArrangement2
 - Label2
 - TextBox1
- HorizontalArrangement3
 - Label3
 - TextBox2
- HorizontalArrangement4
 - Label4
 - TextBox3
- HorizontalArrangement5
 - Label5
- HorizontalArrangement6
 - Button1
 - Button2
- Web1
- Web2
- Clock1
- Any component

Rename Delete

Media

Upload File ...

Viewer

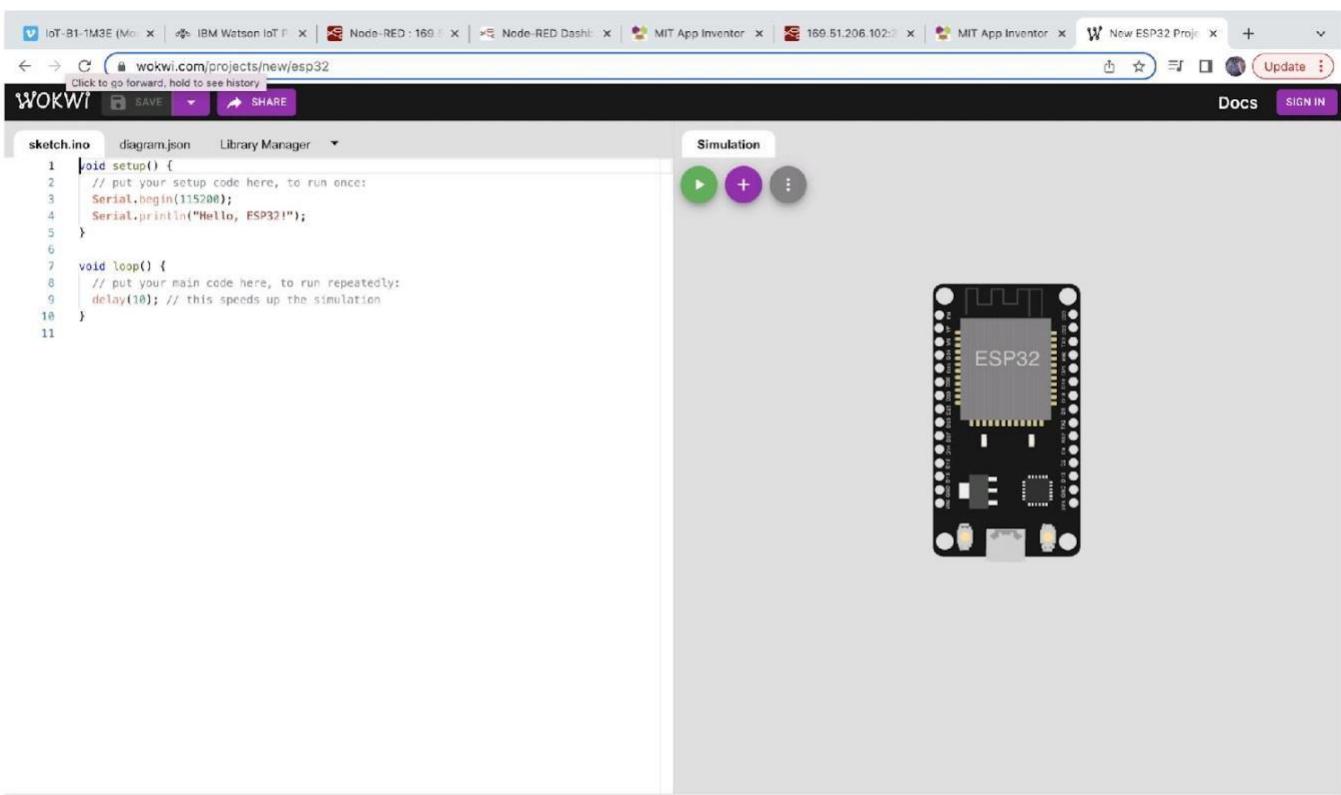
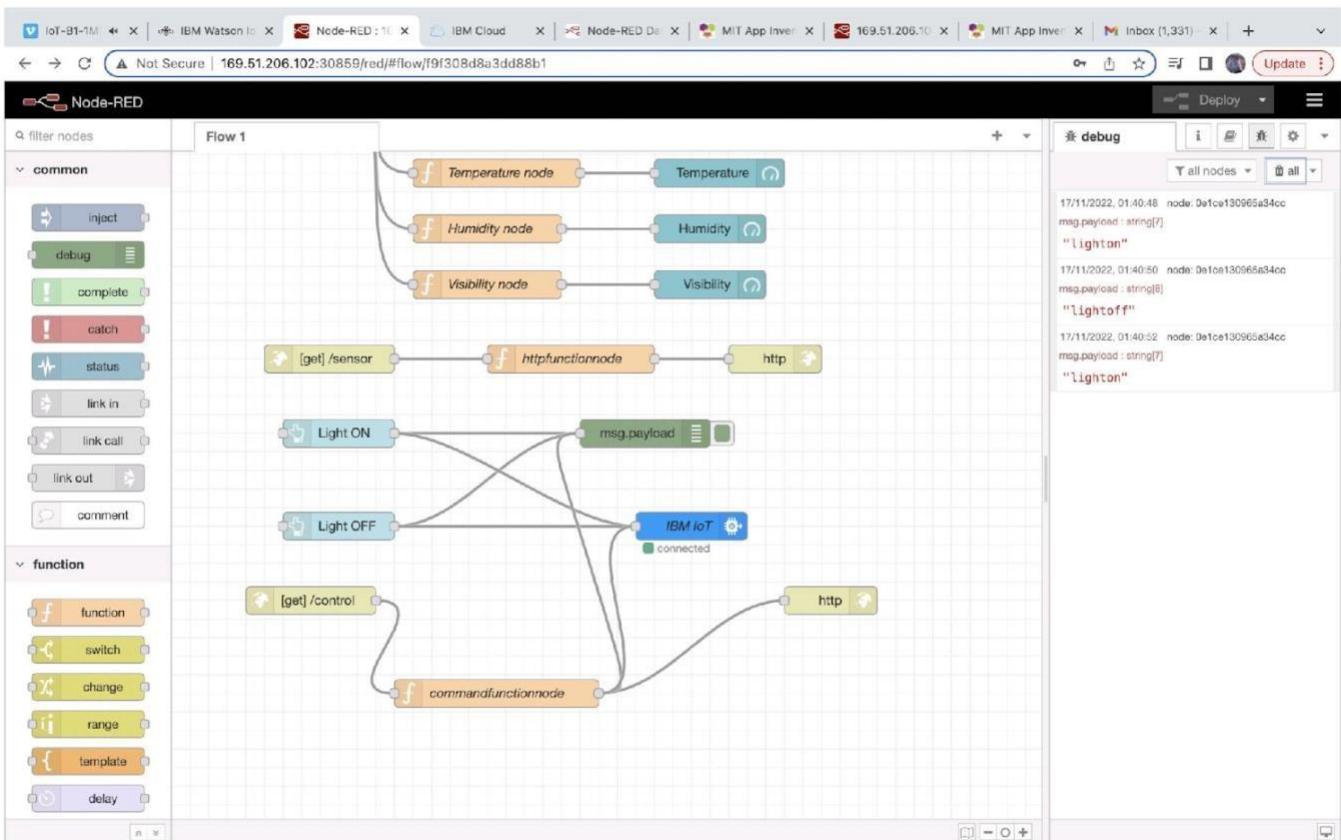
```

set TextBox2 . Text to look up in pairs key
  pairs notFound "not found"
  pairs humid "humid"
  pairs jsonText get responseContent
call Web1 .JsonTextDecode
set TextBox3 . Text to look up in pairs key
  pairs notFound "not found"
  pairs visi "visi"
  pairs jsonText get responseContent
call Web1 .JsonTextDecode
when Button1 .Click
do set Web2 . Url to "http://169.51.206.102:30859/control?command=lightOn"
call Web2 .Get
when Button2 .Click
do set Web2 . Url to "http://169.51.206.102:30859/control?command=lightOff"
call Web2 .Get

```

Show Warnings





WOKWI

sketch.ino

```

1 void setup() {
2     // put your setup code here, to run once:
3     Serial.begin(115200);
4     Serial.println("Hello, ESP32!");
5 }
6
7 void loop() {
8     // put your main code here, to run repeatedly:
9     delay(10); // this speeds up the simulation
10 }
11

```

Simulation

WOKWI

sketch.ino

```

1 #include <WiFi.h> //Library for wifi
2 #include <PubSubClient.h> //Library for MQTT
3 #include "DHT.h" // Library for dht12
4 #define DHTPIN 4      // what pin we're connected to
5 #define DHTTYPE DHT11 // define type of sensor DHT 11
6 #define LED 5
7 DHT dht (DHTPIN, DHTTYPE); // creating the instance by passing pin and type of dht connect
8
9 void callback(char* subscribeTopic, byte* payload, unsigned int payloadLength);
10
11 //-----credentials of IBM Accounts-----
12
13 #define ORG "0jjs12" //IBM ORGANIZATION ID
14 #define DEVICE_TYPE "b1m3deviceType" //Device type mentioned in ibm Watson IOT Platform
15 #define DEVICE_ID "b1m3deviceid" //Device ID mentioned in ibm Watson IOT Platform
16 #define TOKEN "_zIY3G70s50?M5puln" //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/test/fmt/String"; // cmd REPRESENT command type AND CO
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 void setup(){// configuring the ESP32
34 {
35     Serial.begin(115200);
36     dht.begin();
37     pinMode(LED,OUTPUT);
38     delay(10);

```

Simulation

WOKWI

sketch.ino • diagram.json • libraries.txt • Library Manager

```

1 #include <WiFi.h> //library for wifi
2 #include <PubSubClient.h> //library for MQTT
3 #include "DHT.h" // Library for dht11
4 #define DHTPIN 15 // what pin we're connected to
5 #define DHTTYPE DHT22 // define type of sensor DHT 11
6 #define LED 2
7 DHT dht (DHTPIN, DHTTYPE); // creating the instance by passing pin and type of dht connect
8
9 void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
10
11 //-----credentials of IBM Accounts-----
12
13 #define ORG "33lnun"//IBM ORGANITION ID
14 #define DEVICE_TYPE "PNT2022TMID47485"//Device type mentioned in ibm watson IOT Platform
15 #define DEVICE_ID "PNT2022TMID47485"//Device ID mentioned in ibm watson IOT Platform
16 #define TOKEN "4EChe(J)Sq6+l-rwUF" //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
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36   dht.begin();
37   pinMode(LED,OUTPUT);
38   delay(10);
39   Serial.println();
40   wifiConnect();

```

Simulation

WOKWI

sketch.ino • diagram.json • libraries.txt • Library Manager

```

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```

Simulation

00:31.033 66%

Connecting to ...
WiFi connected
IP address:
10.10.0.2
Reconnecting client to 33lnun.messaging.internetofthings.ibmcloud.com
.....