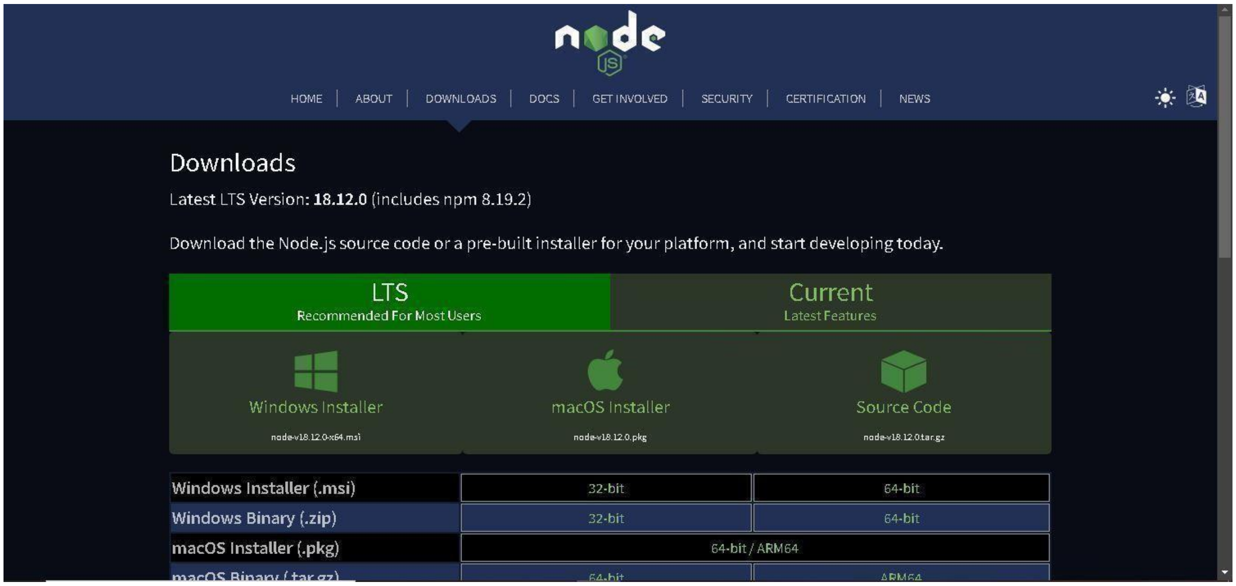
SPRINT 2

Date	November 10, 2022
Team ID	PNT2022TMID36352
Project Name	Real-Time River Water Quality Monitoring and Control System
Maximum Mark	

The following steps are involved:

STEP 1: Download and Install node.js.



Downloads

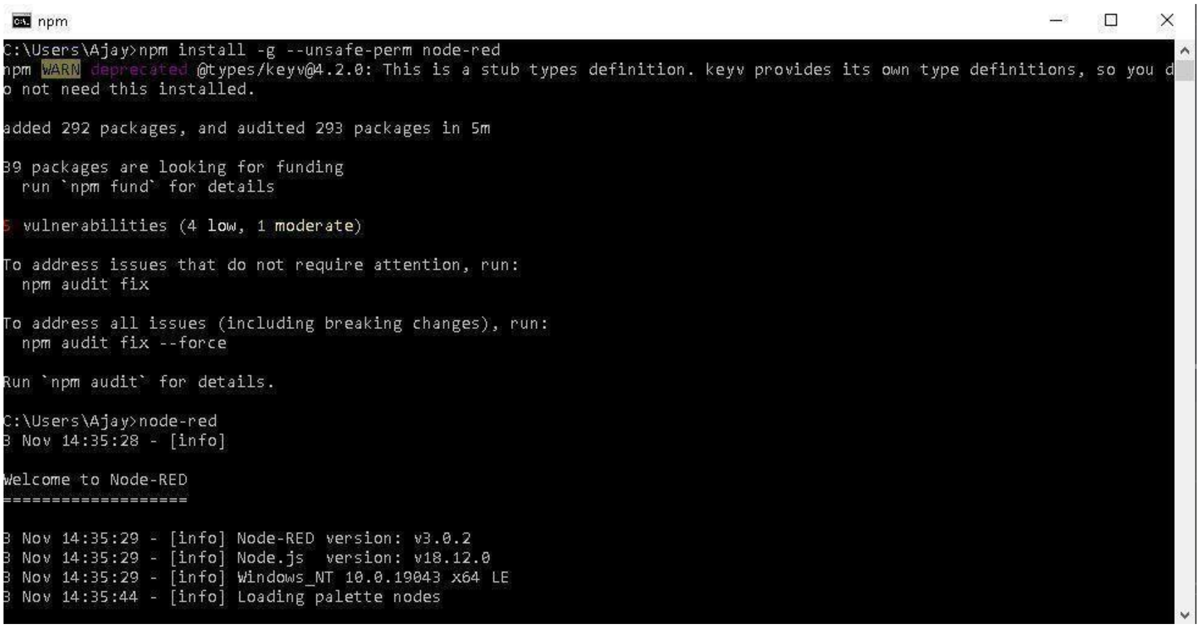
Latest LTS Version: **18.12.0** (includes npm 8.19.2)

Download the Node.js source code or a pre-built installer for your platform, and start developing today.

LTS Recommended For Most Users	Current Latest Features	
Windows Installer node-v18.12.0-x64.msi	macOS Installer node-v18.12.0.pkg	Source Code node-v18.12.0.tar.gz

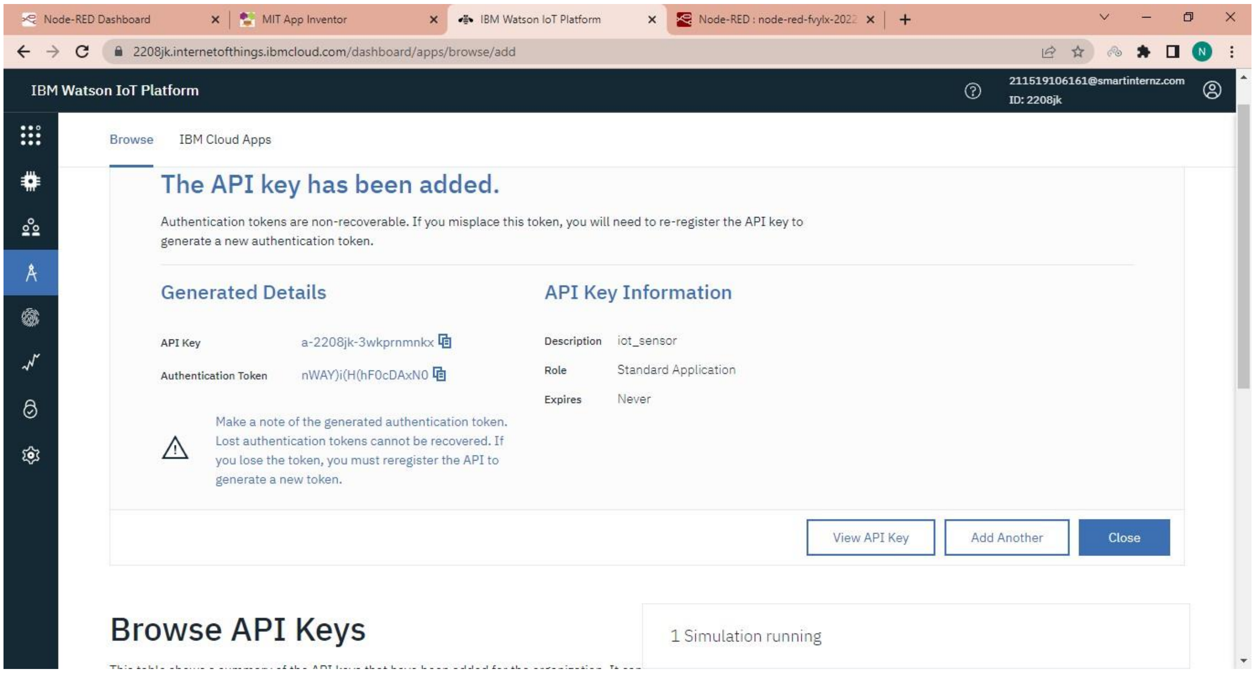
Windows Installer (.msi)	32-bit	64-bit
Windows Binary (.zip)	32-bit	64-bit
macOS Installer (.pkg)	64-bit / ARM64	
macOS Binary (.tar.gz)	64-bit	ARM64

STEP 2: Setup node.js and configure command prompt for error check. Open node-red from the generated link.



```
C:\Users\Ajay>npm install -g --unsafe-perm node-red
npm WARN deprecated @types/keyv@4.2.0: This is a stub types definition. keyv provides its own type definitions, so you d
o not need this installed.

added 292 packages, and audited 293 packages in 5m

39 packages are looking for funding
  run `npm fund` for details

5 vulnerabilities (4 low, 1 moderate)

To address issues that do not require attention, run:
  npm audit fix

To address all issues (including breaking changes), run:
  npm audit fix --force

Run `npm audit` for details.

C:\Users\Ajay>node-red
3 Nov 14:35:28 - [info]

Welcome to Node-RED
===================

3 Nov 14:35:29 - [info] Node-RED version: v3.0.2
3 Nov 14:35:29 - [info] Node.js  version: v18.12.0
3 Nov 14:35:29 - [info] Windows_NT 10.0.19043 x64 LE
3 Nov 14:35:44 - [info] Loading palette nodes
```

STEP 3: Generating API key and Authentication token.



Node-RED Dashboard
MIT App Inventor
IBM Watson IoT Platform
Node-RED : node-red-fvylx-2022
2208jk.internetofthings.ibmcloud.com/dashboard/apps/browse/add
IBM Watson IoT Platform
211519106161@smartinternz.com
ID: 2208jk
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 a-2208jk-3wkprnmnkx

Authentication Token nWAY)i(H(hF0cDAxN0

API Key Information

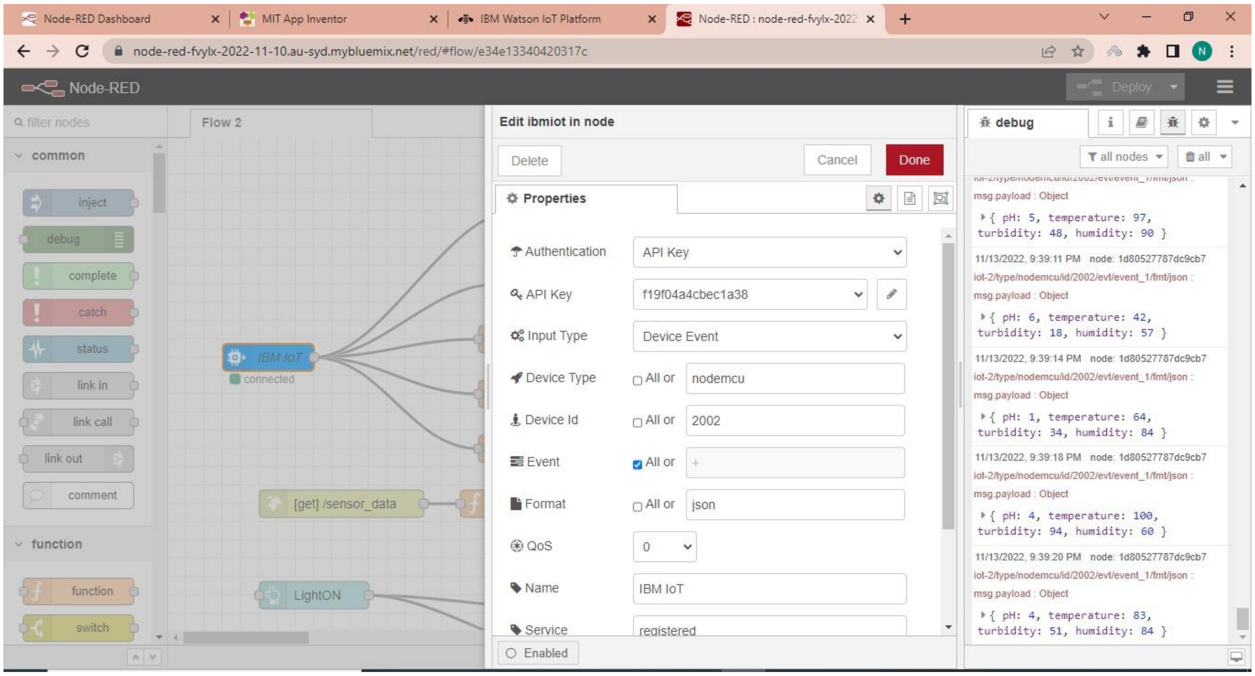
Description iot_sensor

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.

STEP 4: Edit Ibmiot in node.

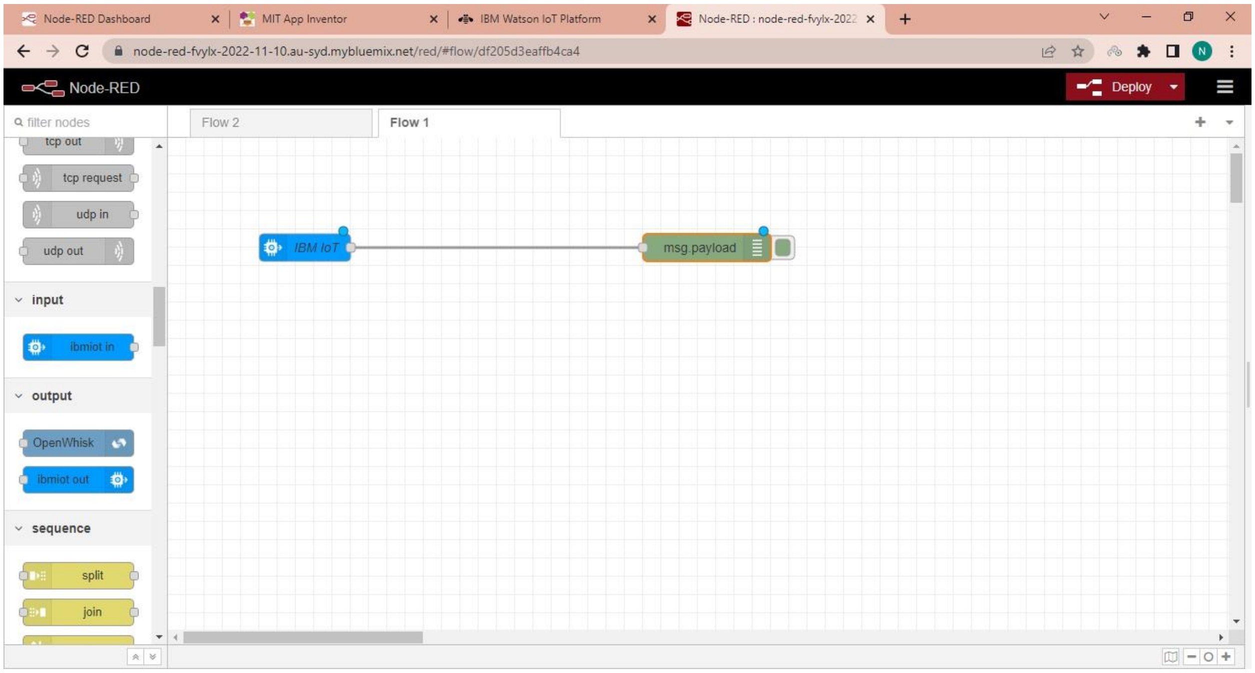


Edit ibmiot in node

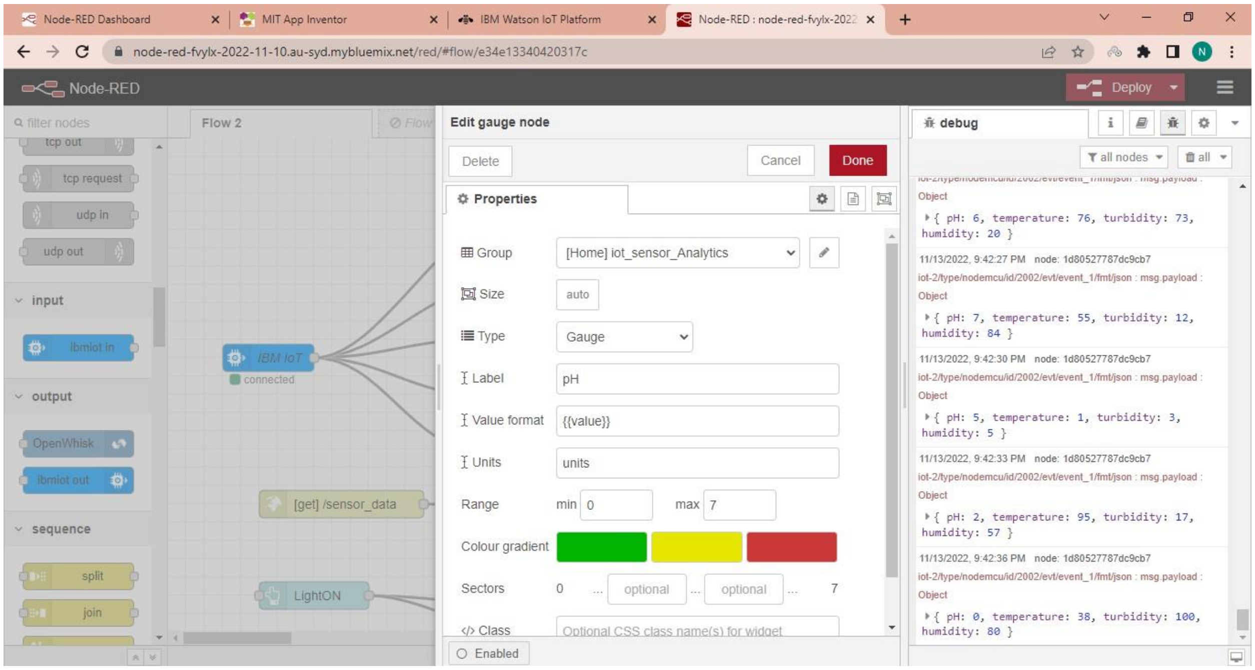
- Authentication: API Key
- API Key: f19f04a4cbec1a38
- Input Type: Device Event
- Device Type: □ All or nodemcu
- Device Id: □ All or 2002
- Event: ☑ All or +
- Format: □ All or json
- QoS: 0
- Name: IBM IoT
- Service: registered

```
msg.payload : Object
▸{ pH: 5, temperature: 97,
turbidity: 48, humidity: 90 }
11/13/2022, 9:39:11 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json :
msg.payload : Object
▸{ pH: 6, temperature: 42,
turbidity: 18, humidity: 57 }
11/13/2022, 9:39:14 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json :
msg.payload : Object
▸{ pH: 1, temperature: 64,
turbidity: 34, humidity: 84 }
11/13/2022, 9:39:18 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json :
msg.payload : Object
▸{ pH: 4, temperature: 100,
turbidity: 94, humidity: 60 }
11/13/2022, 9:39:20 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json :
msg.payload : Object
▸{ pH: 4, temperature: 83,
turbidity: 51, humidity: 84 }
```

STEP 5: Connect Ibmiot in and debug 1 and deploy.



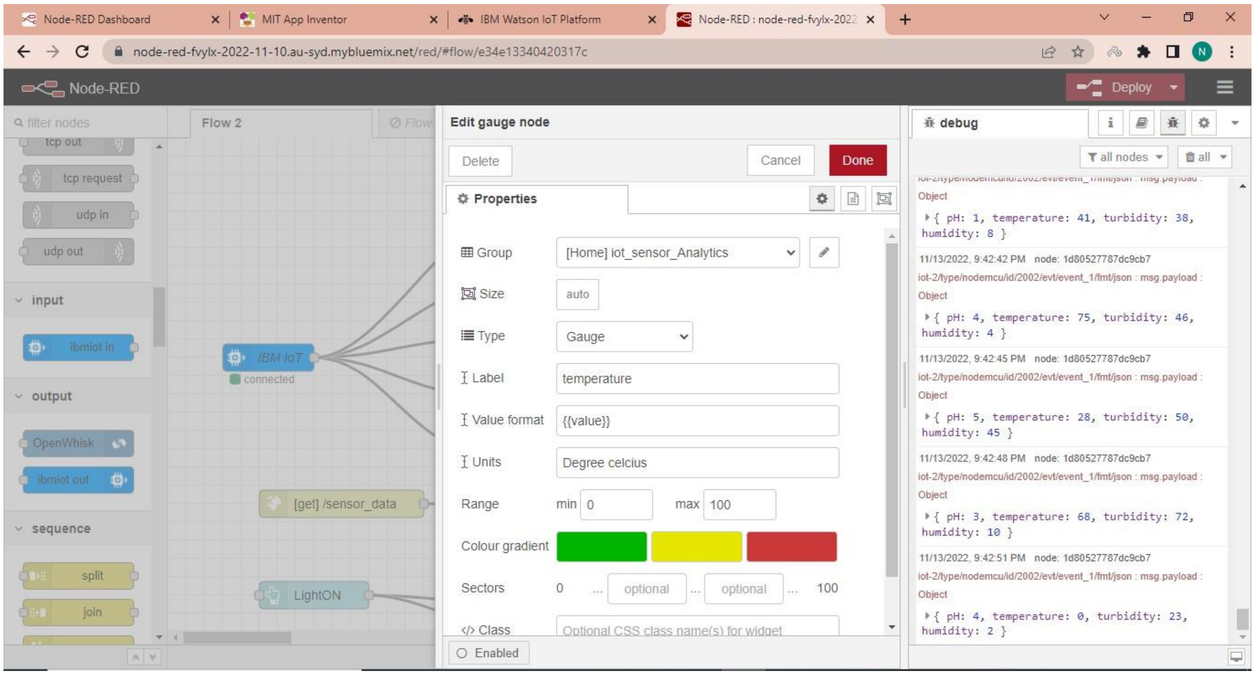
STEP 6: Edit gauge node (here the gauge nodes are named as Temperature, pH and Turbidity).



Edit gauge node

Group: [Home] iot_sensor_Analytics
Size: auto
Type: Gauge
Label: pH
Value format: {{value}}
Units: units
Range: min 0 max 7
Colour gradient: 🟩 🟨 🟥
Sectors: 0 ... optional ... optional ... 7
Class: Optional CSS class name(s) for widget

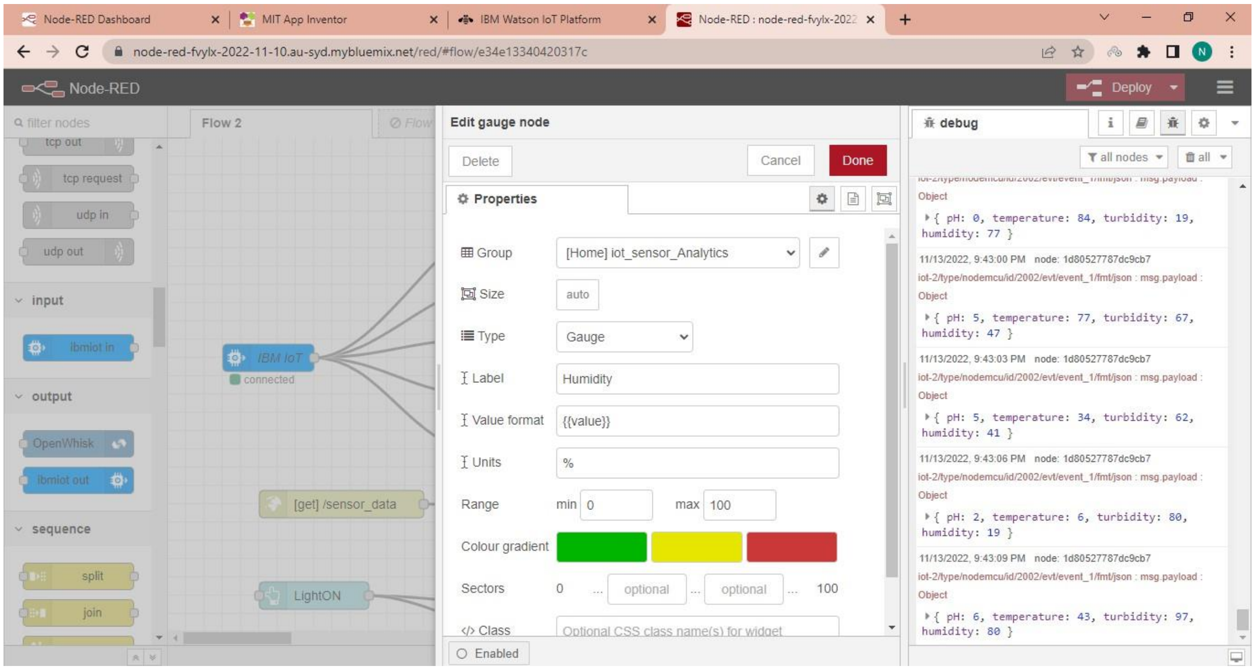
```
Object
▸{ pH: 6, temperature: 76, turbidity: 73,
humidity: 20 }
11/13/2022, 9:42:27 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json : msg.payload :
Object
▸{ pH: 7, temperature: 55, turbidity: 12,
humidity: 84 }
11/13/2022, 9:42:30 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json : msg.payload :
Object
▸{ pH: 5, temperature: 1, turbidity: 3,
humidity: 5 }
11/13/2022, 9:42:33 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json : msg.payload :
Object
▸{ pH: 2, temperature: 95, turbidity: 17,
humidity: 57 }
11/13/2022, 9:42:36 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json : msg.payload :
Object
▸{ pH: 0, temperature: 38, turbidity: 100,
humidity: 80 }
```



Edit gauge node

Group: [Home] iot_sensor_Analytics
Size: auto
Type: Gauge
Label: temperature
Value format: {{value}}
Units: Degree celcius
Range: min 0 max 100
Colour gradient: 🟩 🟨 🟥
Sectors: 0 ... optional ... optional ... 100
Class: Optional CSS class name(s) for widget

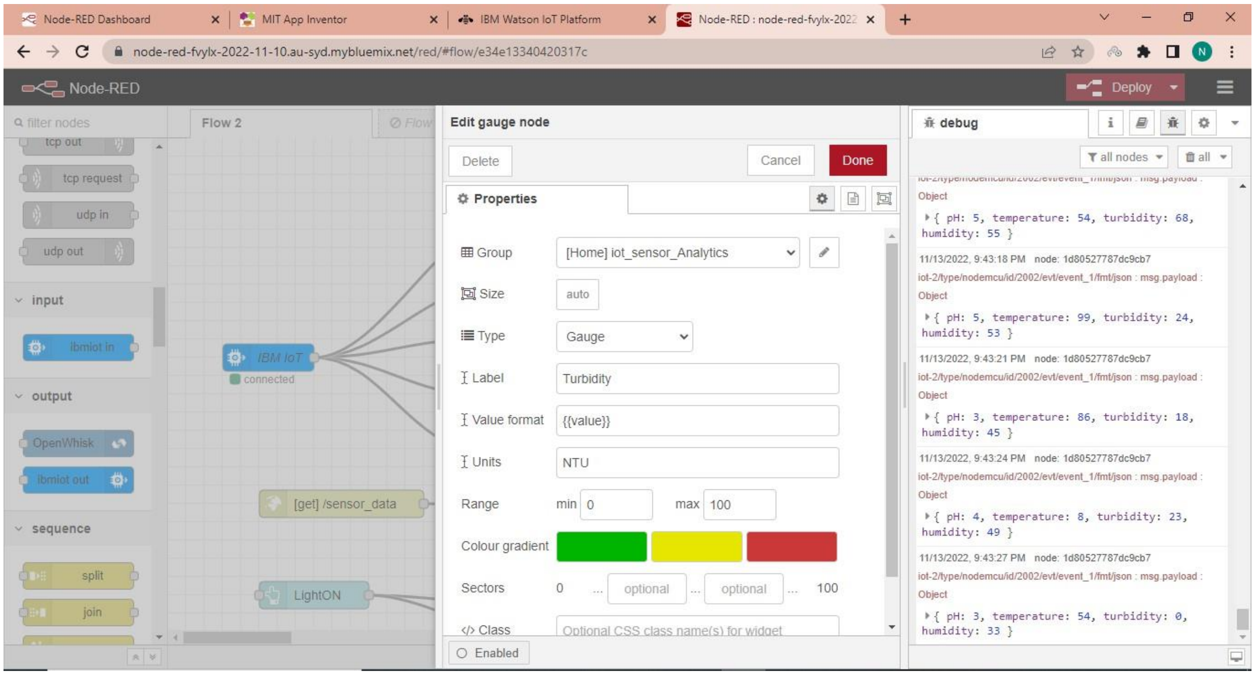
```
Object
▸{ pH: 1, temperature: 41, turbidity: 38,
humidity: 8 }
11/13/2022, 9:42:42 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json : msg.payload :
Object
▸{ pH: 4, temperature: 75, turbidity: 46,
humidity: 4 }
11/13/2022, 9:42:45 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json : msg.payload :
Object
▸{ pH: 5, temperature: 28, turbidity: 50,
humidity: 45 }
11/13/2022, 9:42:48 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json : msg.payload :
Object
▸{ pH: 3, temperature: 68, turbidity: 72,
humidity: 10 }
11/13/2022, 9:42:51 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json : msg.payload :
Object
▸{ pH: 4, temperature: 0, turbidity: 23,
humidity: 2 }
```



node-red-fvylx-2022-11-10.au-syd.mybluemix.net/red/#flow/e34e13340420317c

Group: [Home] iot_sensor_Analytics
Size: auto
Type: Gauge
Label: Humidity
Value format: {{value}}
Units: %
Range: min 0 max 100
Colour gradient: 🟩 🟨 🟥
Sectors: 0 ... optional ... optional ... 100
Class: Optional CSS class name(s) for widget

```
Object
▸{ pH: 0, temperature: 84, turbidity: 19,
humidity: 77 }
11/13/2022, 9:43:00 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json : msg.payload :
Object
▸{ pH: 5, temperature: 77, turbidity: 67,
humidity: 47 }
11/13/2022, 9:43:03 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json : msg.payload :
Object
▸{ pH: 5, temperature: 34, turbidity: 62,
humidity: 41 }
11/13/2022, 9:43:06 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json : msg.payload :
Object
▸{ pH: 2, temperature: 6, turbidity: 80,
humidity: 19 }
11/13/2022, 9:43:09 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json : msg.payload :
Object
▸{ pH: 6, temperature: 43, turbidity: 97,
humidity: 80 }
```

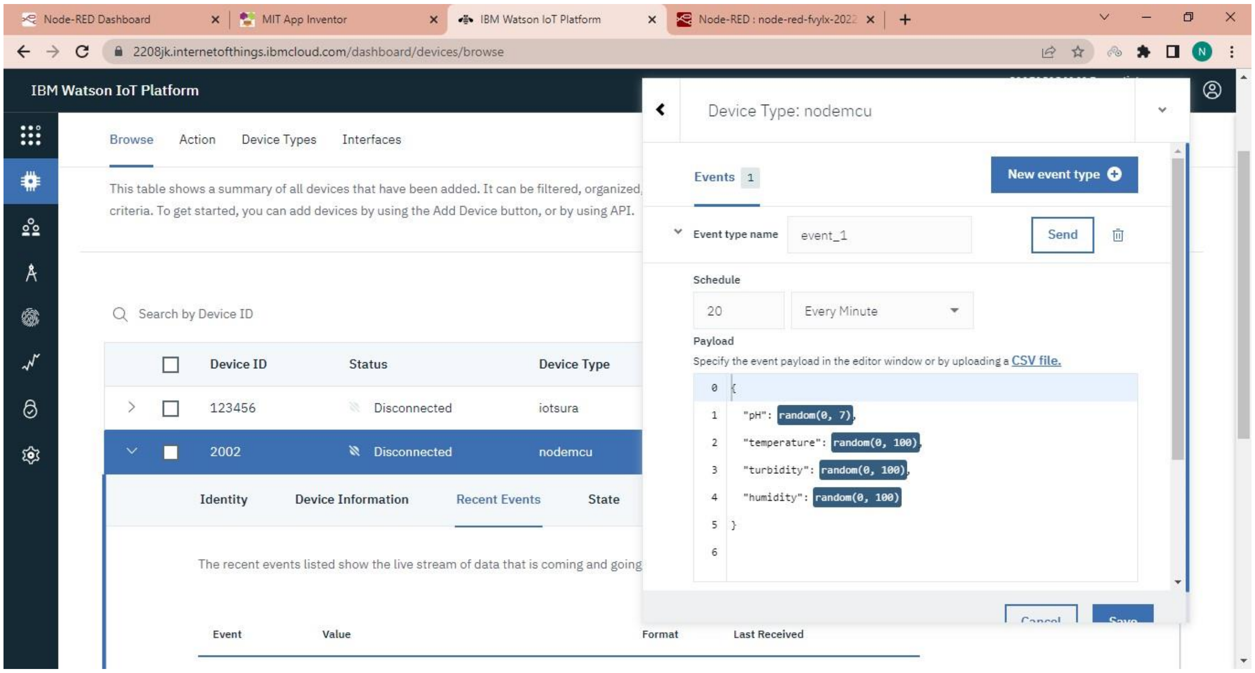


node-red-fvylx-2022-11-10.au-syd.mybluemix.net/red/#flow/e34e13340420317c

Group: [Home] iot_sensor_Analytics
Size: auto
Type: Gauge
Label: Turbidity
Value format: {{value}}
Units: NTU
Range: min 0 max 100
Colour gradient: 🟩 🟨 🟥
Sectors: 0 ... optional ... optional ... 100
Class: Optional CSS class name(s) for widget

```
Object
▸{ pH: 5, temperature: 54, turbidity: 68,
humidity: 55 }
11/13/2022, 9:43:18 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json : msg.payload :
Object
▸{ pH: 5, temperature: 99, turbidity: 24,
humidity: 53 }
11/13/2022, 9:43:21 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json : msg.payload :
Object
▸{ pH: 3, temperature: 86, turbidity: 18,
humidity: 45 }
11/13/2022, 9:43:24 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json : msg.payload :
Object
▸{ pH: 4, temperature: 8, turbidity: 23,
humidity: 49 }
11/13/2022, 9:43:27 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json : msg.payload :
Object
▸{ pH: 3, temperature: 54, turbidity: 0,
humidity: 33 }
```

STEP 7: Simulated program to get the random values.



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

	Device ID	Status	Device Type
□	123456	Disconnected	iotsura
□	2002	Disconnected	nodemcu

The recent events listed show the live stream of data that is coming and going

Event	Value	Format	Last Received

Event type name: event_1

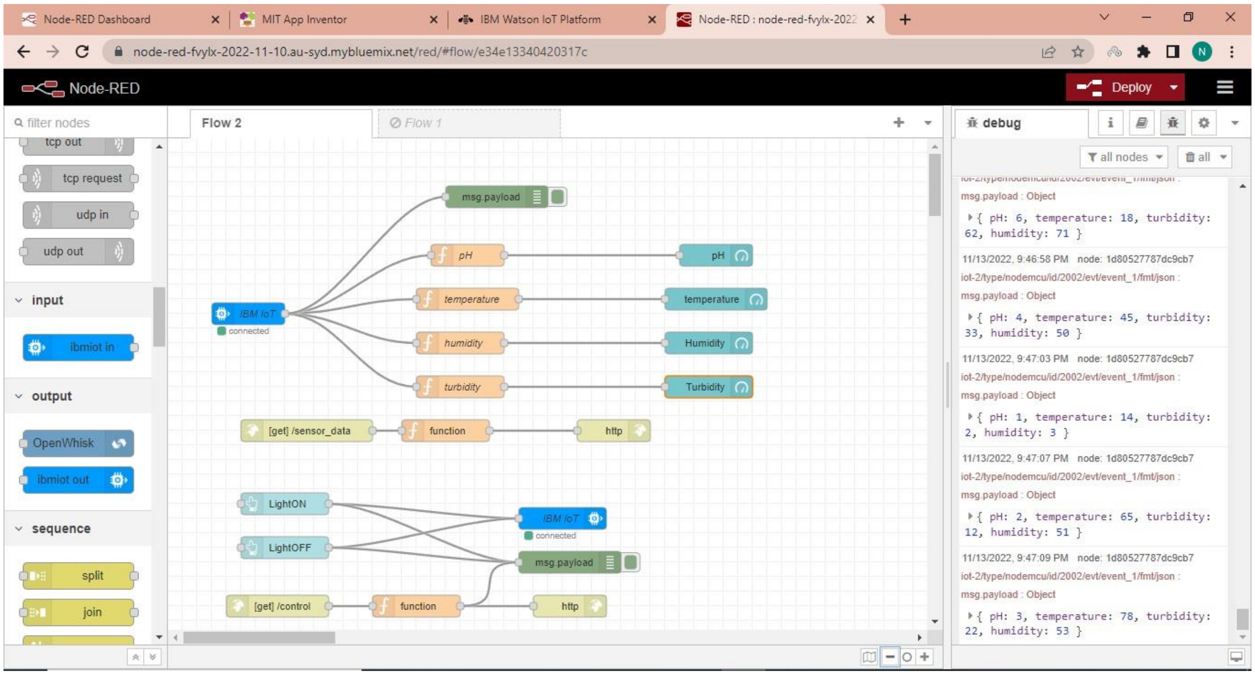
Schedule: 20 Every Minute

Payload

Specify the event payload in the editor window or by uploading a CSV file.

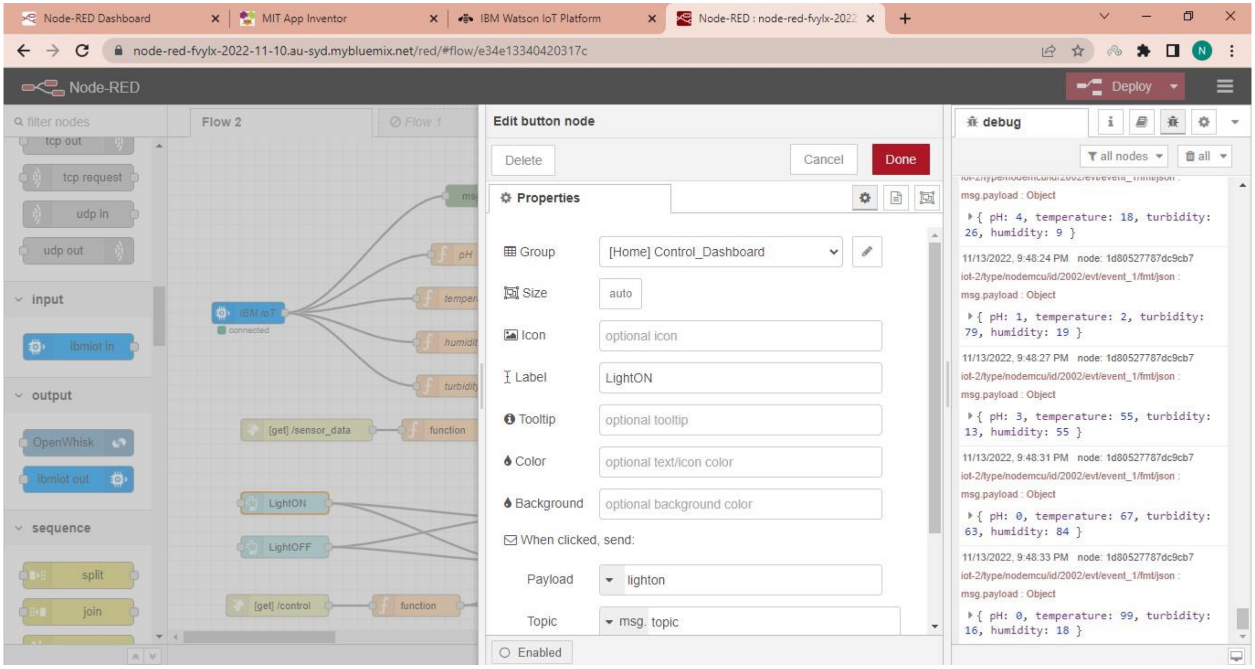
```
{
  "pH": random(0, 7),
  "temperature": random(0, 100),
  "turbidity": random(0, 100),
  "humidity": random(0, 100)
}
```

STEP 8: Generate debug message from IBM Watson IoT Platform and connect the nodes.



```
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json :
msg.payload : Object
{ pH: 6, temperature: 18, turbidity: 62, humidity: 71 }
11/13/2022, 9:46:58 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json :
msg.payload : Object
{ pH: 4, temperature: 45, turbidity: 33, humidity: 50 }
11/13/2022, 9:47:03 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json :
msg.payload : Object
{ pH: 1, temperature: 14, turbidity: 2, humidity: 3 }
11/13/2022, 9:47:07 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json :
msg.payload : Object
{ pH: 2, temperature: 65, turbidity: 12, humidity: 51 }
11/13/2022, 9:47:09 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json :
msg.payload : Object
{ pH: 3, temperature: 78, turbidity: 22, humidity: 53 }
```

STEP 9: Edit button mode [light ON and light OFF].



Edit button node

Delete Cancel Done

Properties

Group [Home] Control_Dashboard

Size auto

Icon optional icon

Label LightON

Tooltip optional tooltip

Color optional text/icon color

Background optional background color

When clicked, send:

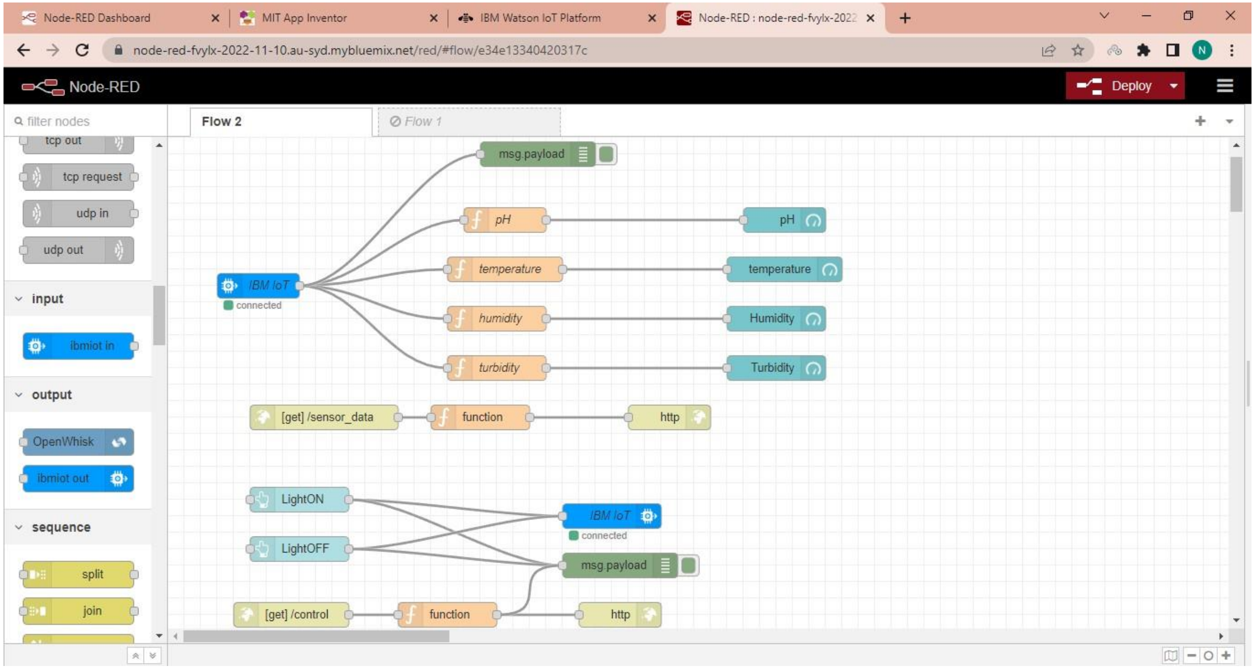
Payload lighton

Topic msg. topic

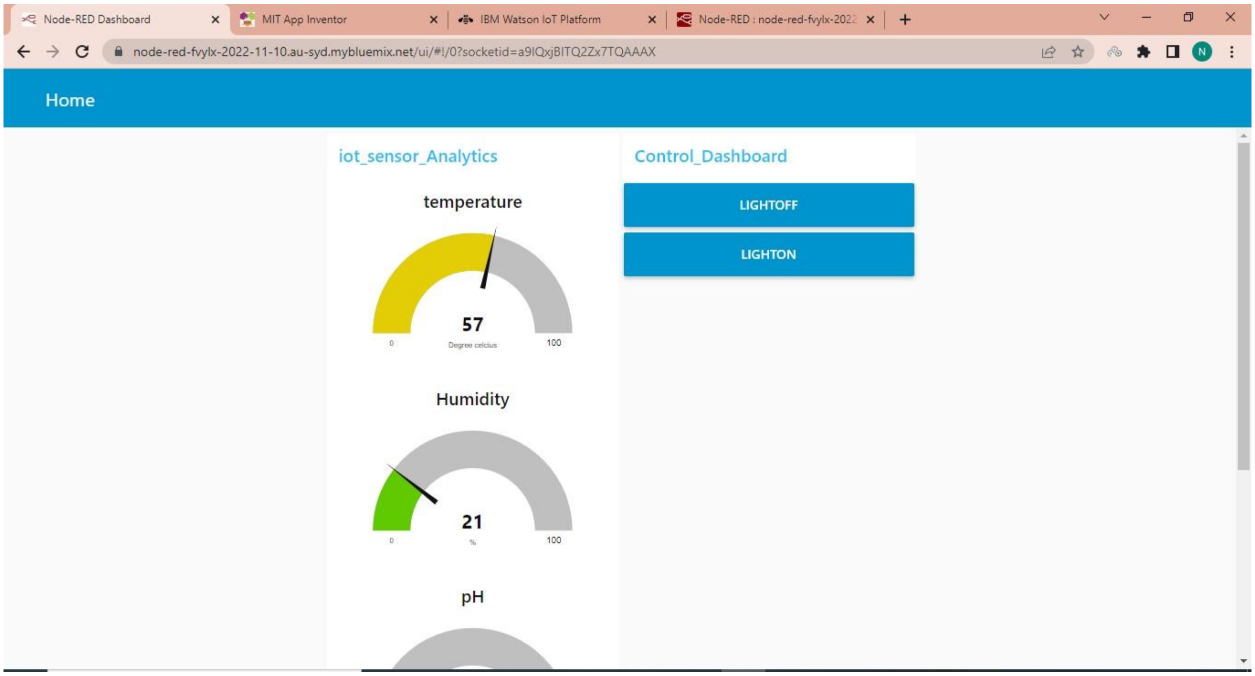
○ Enabled

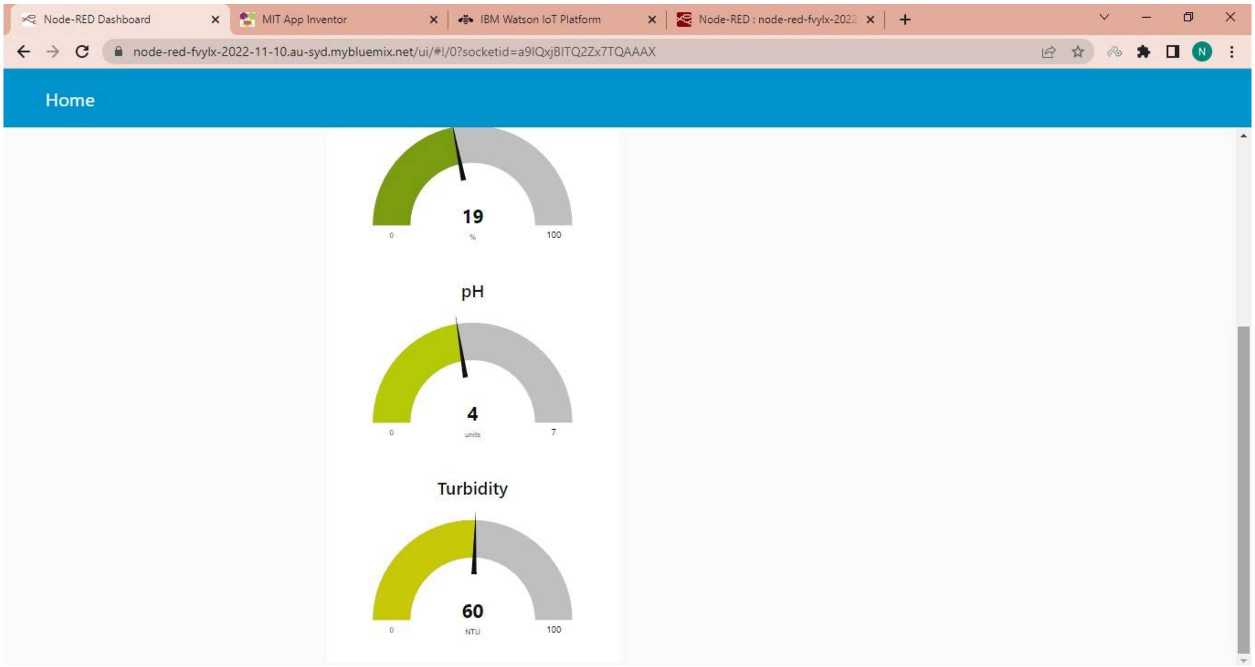
```
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json :
msg.payload : Object
▸{ pH: 4, temperature: 18, turbidity:
26, humidity: 9 }
11/13/2022, 9:48:24 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json :
msg.payload : Object
▸{ pH: 1, temperature: 2, turbidity:
79, humidity: 19 }
11/13/2022, 9:48:27 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json :
msg.payload : Object
▸{ pH: 3, temperature: 55, turbidity:
13, humidity: 55 }
11/13/2022, 9:48:31 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json :
msg.payload : Object
▸{ pH: 0, temperature: 67, turbidity:
63, humidity: 84 }
11/13/2022, 9:48:33 PM   node: 1d80527787dc9cb7
iot-2/type/nodemcu/id/2002/evt/event_1/fmt/json :
msg.payload : Object
▸{ pH: 0, temperature: 99, turbidity:
16, humidity: 18 }
```

STEP 10: Entire flow diagram in Node-RED.

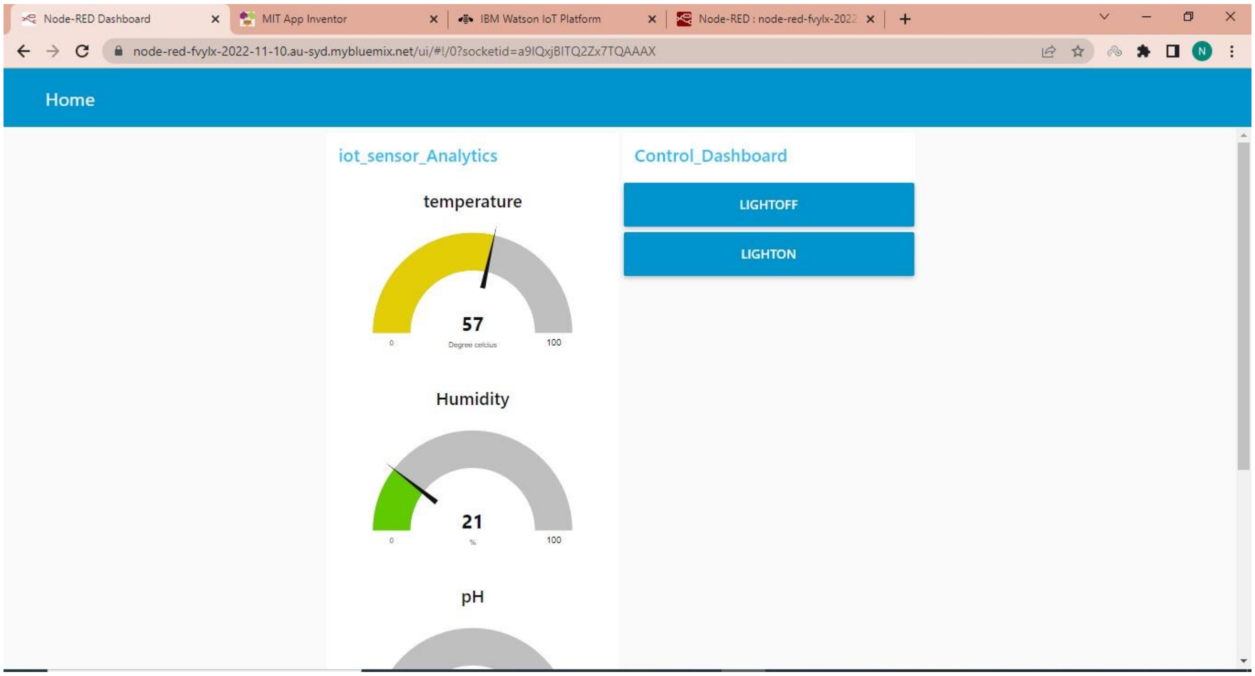


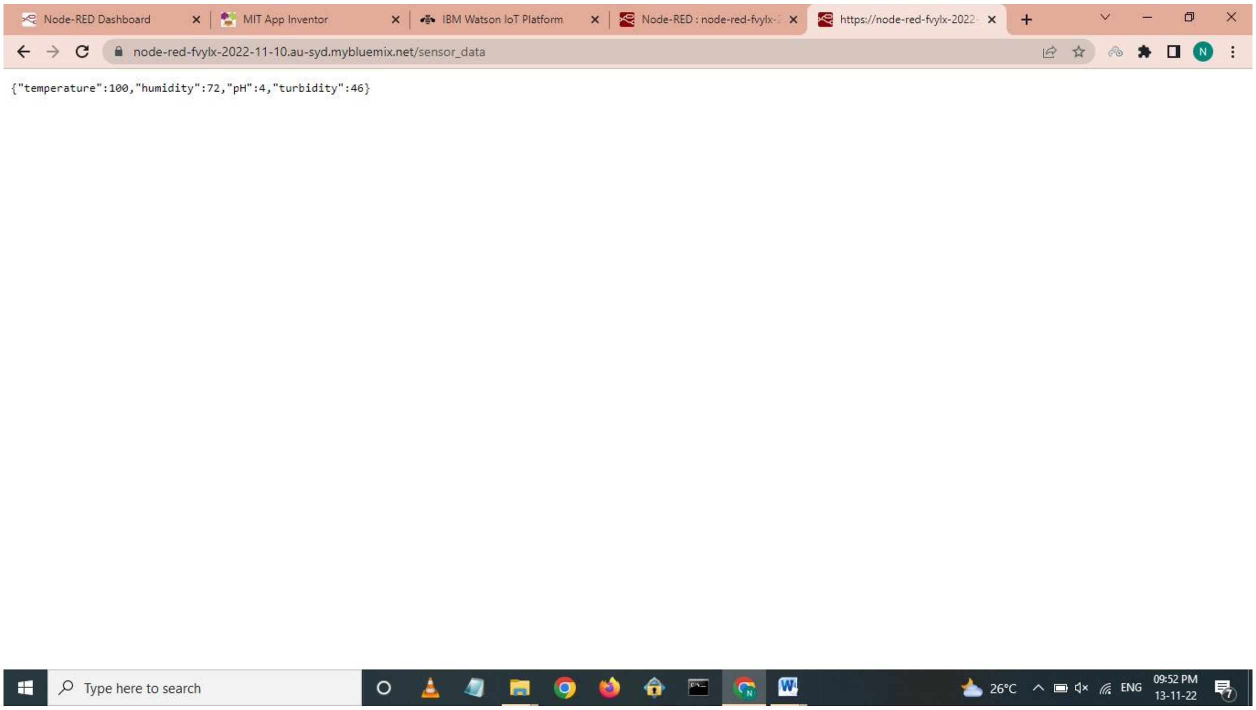
STEP 11: Generate the output from recent events.




Node-RED Dashboard
MIT App Inventor
IBM Watson IoT Platform
Node-RED : node-red-fvylx-2022
node-red-fvylx-2022-11-10.au-syd.mybluemix.net/ui/#!/0?socketid=a9IQxjBITQ2Zx7TQAAAX
Home
19
0
%
100
pH
4
0
units
7
Turbidity
60
0
NTU
100

STEP 12: Implementing url in the function node to generate output




Node-RED Dashboard
MIT App Inventor
IBM Watson IoT Platform
Node-RED : node-red-fvylx-2
https://node-red-fvylx-2022-
node-red-fvylx-2022-11-10.au-syd.mybluemix.net/sensor_data
Type here to search
26°C
ENG
09:52 PM
13-11-22

```
{"temperature":100,"humidity":72,"pH":4,"turbidity":46}
```