

Internet Of Things

Lab - 6

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Aim :

To Perform IoT Automation like to Display the Electricity usage bill, integrate Google Maps with the help of SVG editor, Node-RED, its Dashboard Component and concepts of IoT.

Software :

Node-Red Software.

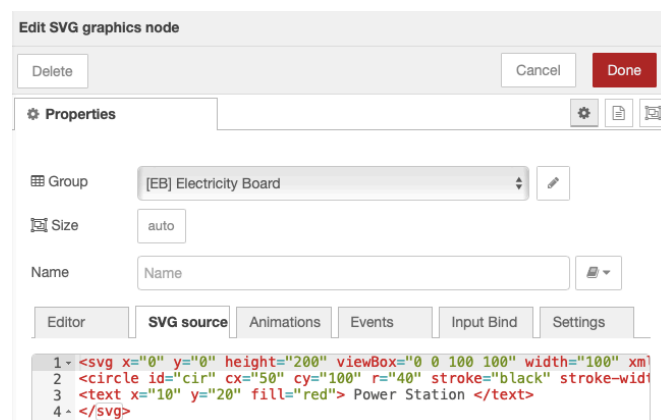
Methodology :

This video instructions are followed : <https://www.youtube.com/watch?v=zbSufot6qXg>

Simulation And Output :

1) To display interactive messages using SVG Graphics Node and perform IoT Automation

(1.1) SVG Graphics Node



(1.2) SVG Graphics Node Code

```
<svg x="0" y="0" height="200" viewBox="0 0 100 100" width="100" xmlns="http://  
www.w3.org/2000/svg" xmlns:svg="http://www.w3.org/2000/svg"  
xmlns:xlink="http://www.w3.org/1999/xlink">  
  
<circle id="cir" cx="50" cy="100" r="40" stroke="black" stroke-width="3" fill="red" />  
  
<text x="10" y="20" fill="red"> Power Station </text>  
  
</svg>
```

(1.3) Text Node

Edit text node

Delete Cancel Done

Properties

Group [EB] Electricity Board

Size auto

Label Power Status

Value format {{msg.payload}}

Layout

label value label value label value

label value label value

Name

(1.4) Debug Node

Edit debug node

Delete Cancel Done

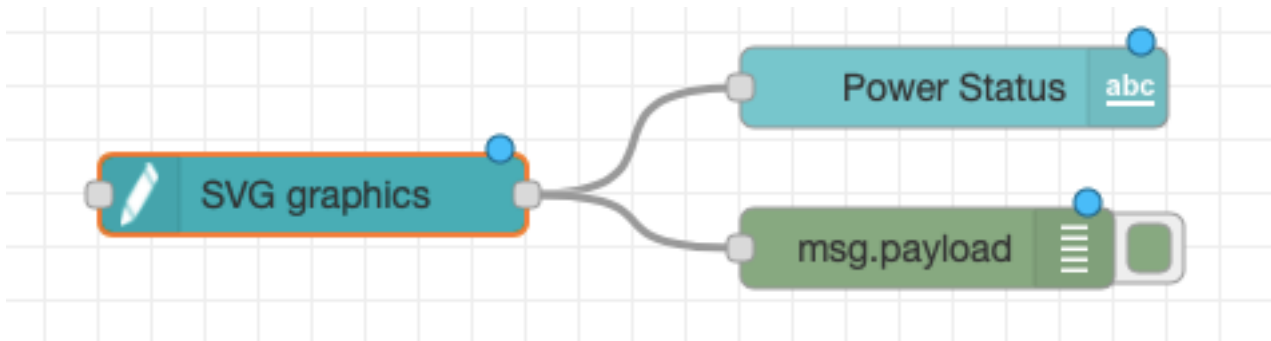
Properties

Output msg. payload

To ☒ debug window ☐ system console ☐ node status (32 characters)

Name Name

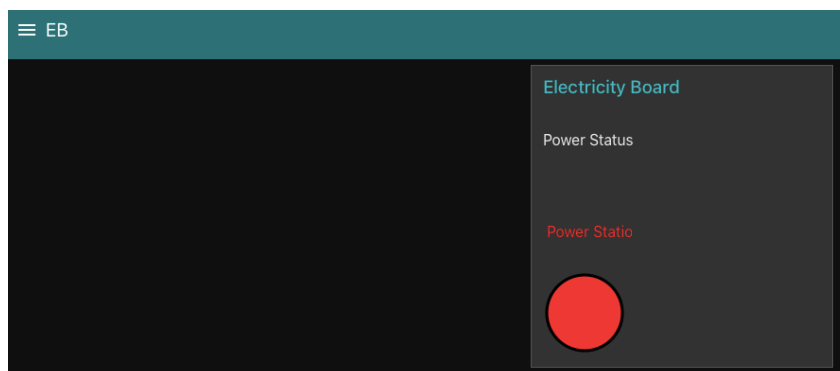
(1.5) Complete Circuit Flow



(1.6) Complete Circuit Flow Code

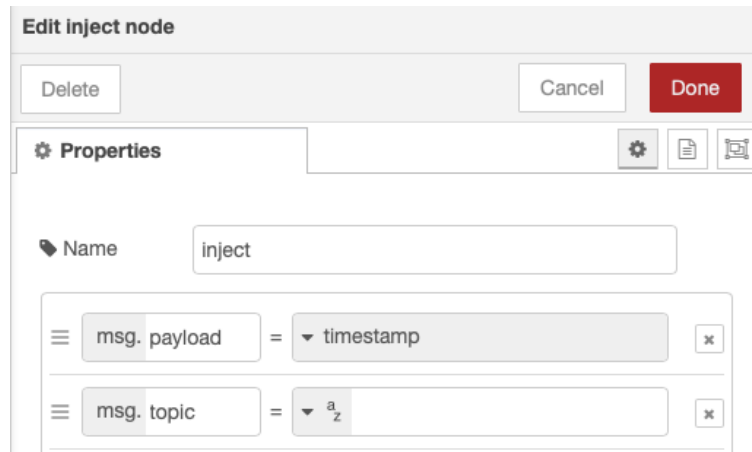
```
[{"id":"c6efbfa4.7d085","type":"tab","label":"lab 6 electricity board","disabled":false,"info":""},
{"id":"fc678b88.8d9f78","type":"ui_svg_graphics","z":"c6efbfa4.7d085","group":"16c53fcc.777ba","order":0,"width":0,"height":0,"svgString":"<svg x=\"0\" y=\"0\" height=\"200\" viewBox=\"0 0 100 100\" width=\"100\" xmlns=\"http://www.w3.org/2000/svg\" xmlns:svg=\"http://www.w3.org/2000/svg\" xmlns:xlink=\"http://www.w3.org/1999/xlink\">\n<circle id=\"cir\" cx=\"50\" cy=\"100\" r=\"40\" stroke=\"black\" stroke-width=\"3\" fill=\"red\" />\n<text x=\"10\" y=\"20\" fill=\"red\"> Power Station </text>\n</svg>","clickableShapes":[{"targetId":"#cir","action":"click","payload":"Power On","payloadType":"str","topic":"#cir"}],"smilAnimations":[],"bindings":[],"showCoordinates":false,"autoFormatAfterEdit":false,"showBrowserErrors":false,"outputField":"payload","editorUrl":"//drawsvg.org/drawsvg.html","directory":"","panning":"disabled","zooming":"disabled","panOnlyWhenZoomed":false,"doubleClickZoomEnabled":false,"mouseWheelZoomEnabled":false,"name":"","x":280,"y":220,"wires":[["3e814d13.e80872","37ee986f.f85ce8"]]},
{"id":"37ee986f.f85ce8","type":"debug","z":"c6efbfa4.7d085","name":"","active":true,"tosidebar":true,"console":false,"tostatus":false,"complete":"payload","targetType":"msg","statusVal":"","statusType":"auto","x":510,"y":240,"wires":[]},
{"id":"3e814d13.e80872","type":"ui_text","z":"c6efbfa4.7d085","group":"16c53fcc.777ba","order":1,"width":0,"height":0,"name":"","label":"Power Status","format":"{{ msg.payload }}","layout":"row-spread","x":520,"y":180,"wires":[]},
{"id":"16c53fcc.777ba","type":"ui_group","z":"","name":"Electricity Board","tab":"d4af2056.81534","order":2,"disp":true,"width":"6","collapse":false},
{"id":"d4af2056.81534","type":"ui_tab","z":"","name":"EB","icon":"dashboard","disabled":false,"hidden":false}]
```

(1.6) Complete Circuit Flow Code



2) To display and perform IoT Automation of changing colour of diagrams using Node red and SVG Vector Graphics

(2.1) Inject Node



Edit inject node

Delete Cancel Done

Properties

Name inject

msg.payload = timestamp

msg.topic = a_z

(2.2) Function Node



Edit function node

Delete Cancel Done

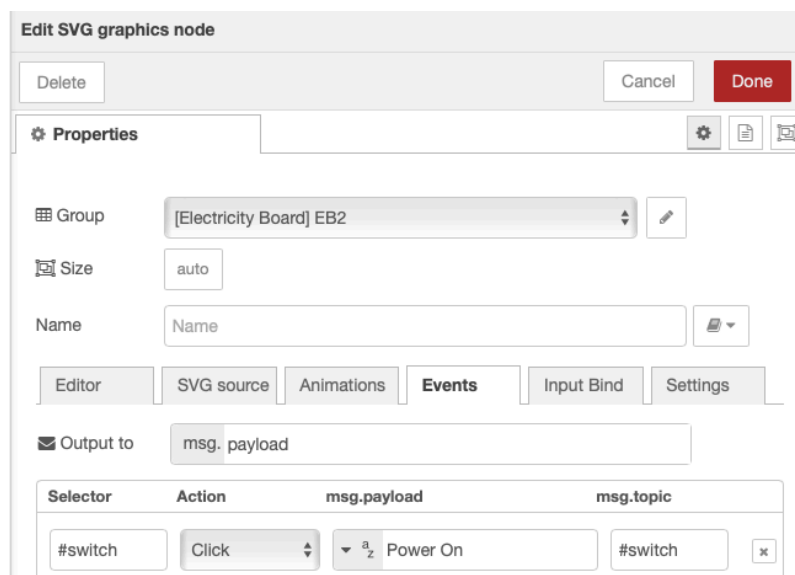
Properties

Name Name

Setup Function Close

```
1 var msg;
2 msg.icon_fill = "green";
3 return msg;
```

(2.3) SVG Graphics Node



Edit SVG graphics node

Delete Cancel Done

Properties

Group [Electricity Board] EB2

Size auto

Name Name

Editor SVG source Animations Events Input Bind Settings

Output to msg.payload

Selector	Action	msg.payload	msg.topic
#switch	Click	a_z Power On	#switch

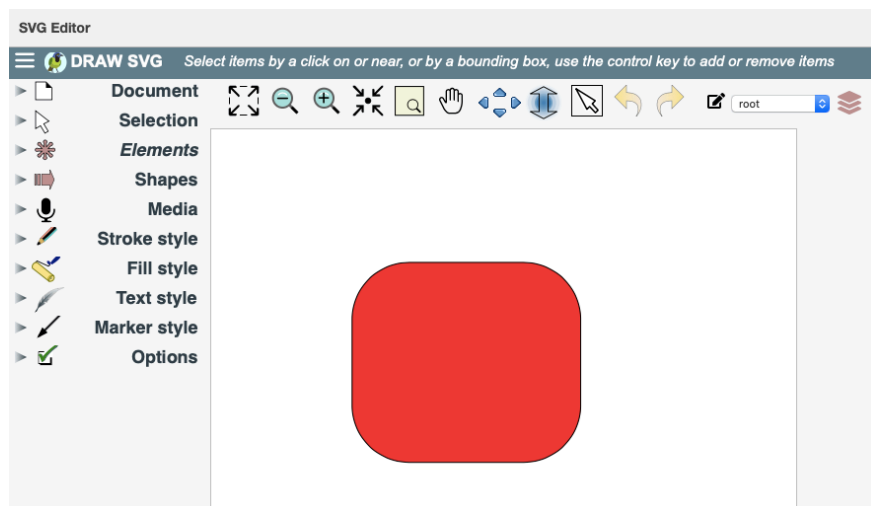
(2.4) SVG Graphics Code

```
<svg xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/
xlink" x="0" y="0" height="100" viewBox="0 0 100 100" width="100"><rect
id="svgEditorBackground" x="0" y="0" width="100" height="100" style="fill: none;
stroke: none;"/><defs id="svgEditorDefs">

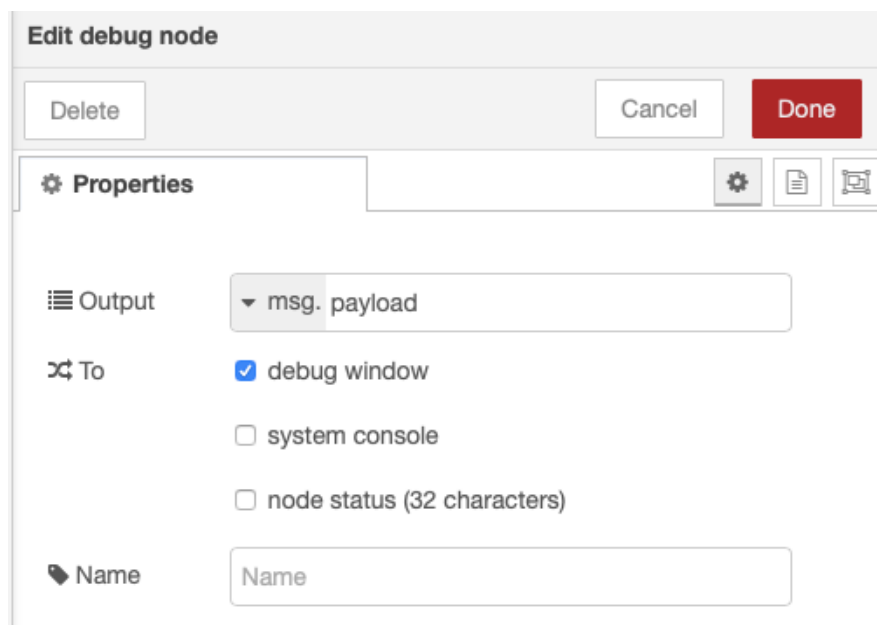
  <polygon id="svgEditorIconDefs" style="fill:rosybrown;"/><polygon
id="svgEditorShapeDefs" style="fill:rosybrown;stroke:black;vector-effect:non-
scaling-stroke;stroke-width:1px;"/></defs><path
d="M13.84615421295166,2.769233465194702v-1.5a2,2,0,0,0,-2,-2h-4a2,2,0,0,0,-
2,2v3a2,2,0,0,0,2,2h4a2,2,0,0,0,2,-2Z" style="fill:{{msg.icon_fill}}; stroke:black;
vector-effect:non-scaling-stroke;stroke-width:1px;" id="switch"
transform="matrix(4.86829 0 0 4.86829 -4.45652 26.2383)"/>

</svg>
```

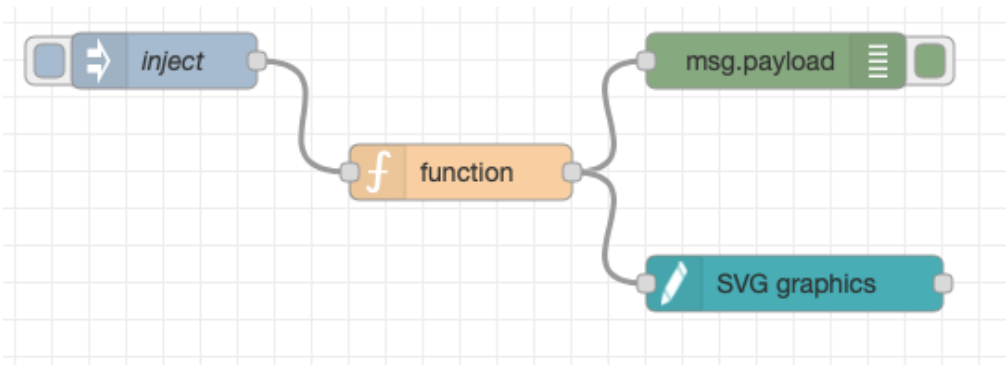
(2.5) SVG Graphics Editor



(2.6) Debug Node



(2.7) Complete Circuit Flow



(2.8) Complete Circuit Flow Code

```
[{"id":"878ab3de.901b5","type":"tab","label":"IoT Automation Change Color Lab 6","disabled":false,"info":""},
{"id":"8f85068.d719af8","type":"inject","z":"878ab3de.901b5","name":"inject","props":
[{"p":"payload"},
{"p":"topic","vt":"str"}],"repeat":"","crontab":"","once":false,"onceDelay":0.1,"topic":"","pa
yload":"","payloadType":"date","x":140,"y":100,"wires":[["4d4a7393.11f124"]]},
{"id":"88a4f730.b2187","type":"debug","z":"878ab3de.901b5","name":"","active":true,"t
osidebar":true,"console":false,"tostatus":false,"complete":"payload","targetType":"msg
","statusVal":"","statusType":"auto","x":470,"y":100,"wires":[]},
{"id":"4d4a7393.11f124","type":"function","z":"878ab3de.901b5","name":"","func":"var
msg;\nmsg.icon_fill = \"green\";\nreturn
msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","x":300,"y":160,"wires":
[["88a4f730.b2187","170c4d40.1908c3"]]},
{"id":"170c4d40.1908c3","type":"ui_svg_graphics","z":"878ab3de.901b5","group":"6fe
8belb.6eff4","order":0,"width":0,"height":0,"svgString":"<svg xmlns=\"http://
www.w3.org/2000/svg\" xmlns:xlink=\"http://www.w3.org/1999/xlink\" x=\"0\"
y=\"0\" height=\"100\" viewBox=\"0 0 100 100\" width=\"100\"><rect
id=\"svgEditorBackground\" x=\"0\" y=\"0\" width=\"100\" height=\"100\"
style=\"fill: none; stroke: none;\"/><defs id=\"svgEditorDefs\">\n  <polygon
id=\"svgEditorIconDefs\" style=\"fill:rosybrown;\"/><polygon
id=\"svgEditorShapeDefs\" style=\"fill:rosybrown;stroke:black;vector-effect:non-
scaling-stroke;stroke-width:1px;\"/></defs><path
d=\"M13.84615421295166,2.769233465194702v-1.5a2,2,0,0,0,-2,-2h-4a2,2,0,0,0,-
2,2v3a2,2,0,0,0,2,2h4a2,2,0,0,0,2,-2Z\" style=\"fill:{ {msg.icon_fill} }; stroke:black;
vector-effect:non-scaling-stroke;stroke-width:1px;\" id=\"switch\"
transform=\"matrix(4.86829 0 0 4.86829 -4.45652 26.2383)\"/></n>
</svg>","clickableShapes":[{"targetId":"#switch","action":"click","payload":"Power
On","payloadType":"str","topic":"#switch"}],"smilAnimations":[],"bindings":
[],"showCoordinates":false,"autoFormatAfterEdit":false,"showBrowserErrors":false,"
outputField":"payload","editorUrl":"//drawsvg.org/
drawsvg.html","directory":"","panning":"disabled","zooming":"disabled","panOnlyWhe
nZoomed":false,"doubleClickZoomEnabled":false,"mouseWheelZoomEnabled":false,"n
ame":"","x":480,"y":220,"wires":[]]},
{"id":"6fe8belb.6eff4","type":"ui_group","z":"","name":"EB2","tab":"e4ad83f4.147fc8","o
rder":1,"disp":true,"width":"6","collapse":false},
{"id":"e4ad83f4.147fc8","type":"ui_tab","z":"","name":"Electricity
Board","icon":"dashboard","disabled":false,"hidden":false}]
```

(2.9) Output



3) To display a Map and Automate it using Node red and SVG Vector Graphics

(3.1) SVG Graphics Node

Edit SVG graphics node

Delete

Cancel

Done

⚙ Properties

⚙

📄

🖼

🗪 Group

[GPS] GPS Tracking

✎

📏 Size

auto

Name

Name

📄 ▼

Editor

SVG source

Animations

Events

Input Bind

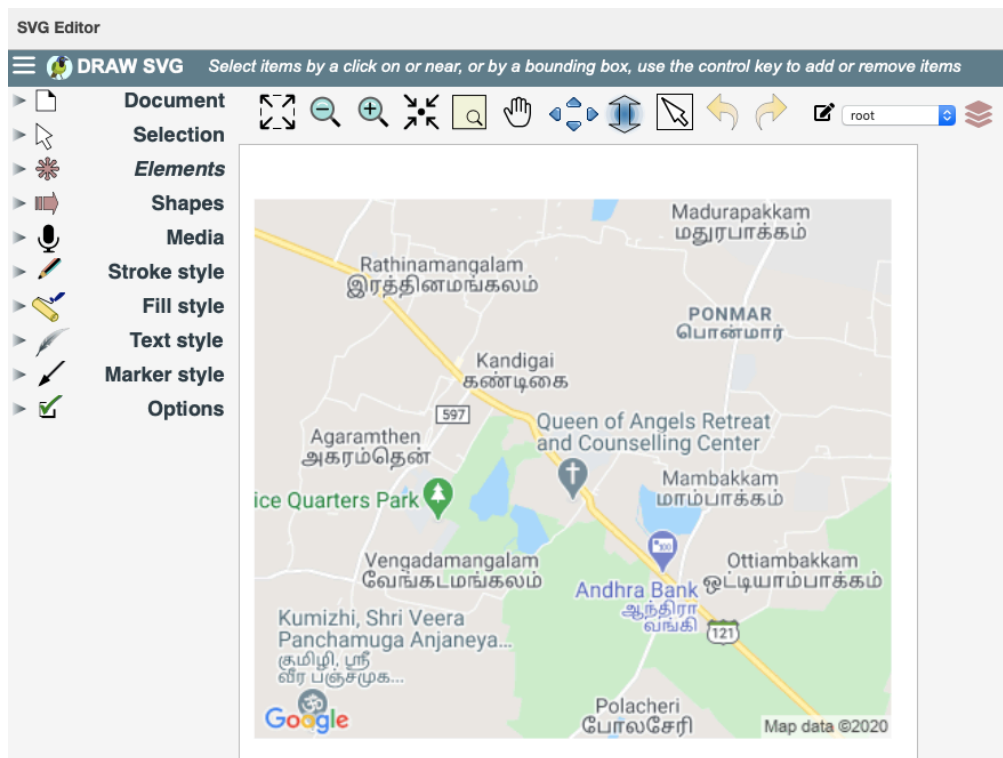
Settings

✉ Output to

msg. payload

Selector	Action	msg.payload	msg.topic
#map	Click	VIT Chennai	#map

(3.2) SVG Graphics Editor



(3.3) Text Node

Edit text node

Delete Cancel Done

Properties

Group [GPS] GPS Tracking

Size auto

Label Map Location

Value format {{msg.payload}}

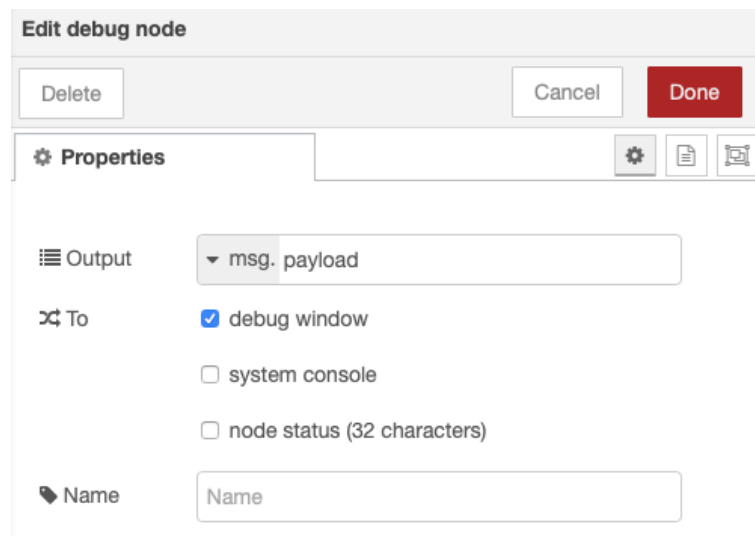
Layout

label value label value label value

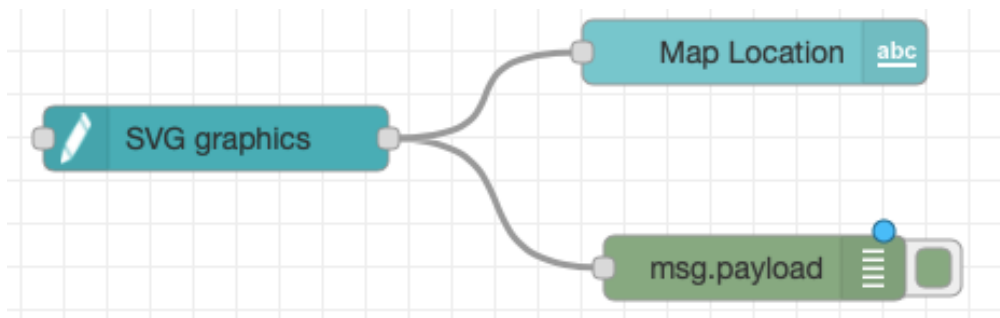
label value label value

Name

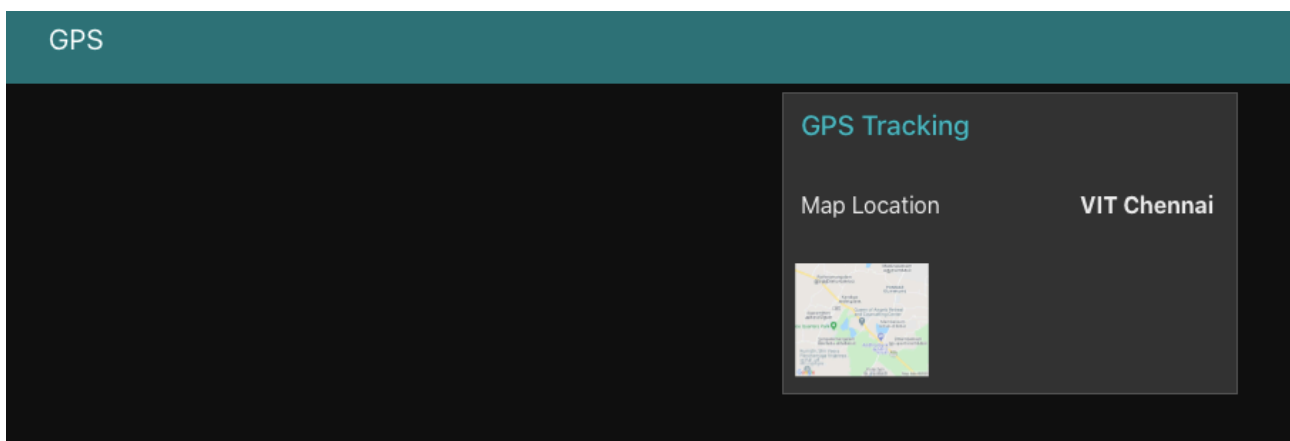
(3.4) Debug Node



(3.5) Complete Circuit Flow



(3.6) Output



Result :

Thus, with the help of Node-RED we have designed a graphic diagrams, used automation to automate the diagrams colours, and implemented a Map with location and have analysed it using Node Red, SVG Vector Graphics, visualised it through the Node-red UI Dashboard and have put the learnt concepts to practical use.