**Building Web App Using Node-Red**

Follow the given steps to get started with the node-red service to create a User Interface:

Click on a drop-down, present beside the deploy option, on the top-right corner. Select ‘Manage Palette’.

In the User Settings, go to ‘install’ tab and search for ‘node-red-contrib-scx-ibmiotapp’ to install ibm nodes on to the node-red service.

Similarly, in order to install dashboard nodes, search for ‘node-red-dashboard’ and complete the process.

All the respective nodes of the dashboard will be added to the left pane of the screen.

Next, the following steps will help you to create the UI of your project:

Click and drag the ‘button’ and place it on the screen. This node is used to insert a button on the screen to switch on the first street light. Click on the node,

Select the group, if there is no group then click on add new dashboard group.

Give an appropriate label name.

Give the payload as a string and give the entry value as lighton1.

Make sure you do not change anything else, you can fill in the optional fields if needed and click on done.

Click and drag the ‘button’ and place it on the screen. This node is used to insert a button on the screen to switch off the first street light. Click on the node,

Select the group, if there is no group then click on add new dashboard group.

Give an appropriate label name.

Give the payload as a string and give the entry value as lightoff2.

Make sure you do not change anything else, you can fill in the optional fields if needed and click on done.

Connect both buttons to debug, to print the output of the commands. Click and drag the ‘ibmiot out’’ node and place it on the screen. This node is used to send commands to a device or send an event on behalf of a device. Connect both the buttons to the ‘ibmiot out’ node and click that node:

Select the authentication as API, and give the API credentials of your generated API key.

Select the Input type as ‘Device Command’.

Fill in the device credentials that you have stored in the notepad earlier.

Give the command type as ‘Test’ and format as ‘String’.

Give data as ‘Data’.

Give the name and click on done.

Click Deploy

Above three steps belong to street light 1. Repeat the steps in the same order for street light 2 and street light 3. Wherever you see the lighton1 command replace it with lighton2 and lighton3 respectively and similarly with the lightoff commands.

After following the above steps your dashboard will look something like this:

Press the button and you can view the output of it on your device. For instance, press on light on1, light on 3 you will see that the first and last lights brighten up and light 2 remains in its initial state.