SPRINT - 2

Date	14 November 2022
Team ID	PNT2022TMID04642
Project Name	Smart Farmer-IoT Enabled Smart Farming Application

Build Project

Connecting IOT Simulator to IBM Watson IOTPlatform

Give the credentials of your device in IBM Watson IOTPlatform

Click on connect

My credentials given to simulator are:

OrgID: 3wc7ia

api: s-madeqrff-werwete

Device type:NodeMCU

token: n-asqw2ffeg-sasfegr

Device ID : 12345

Device Token : 12345678

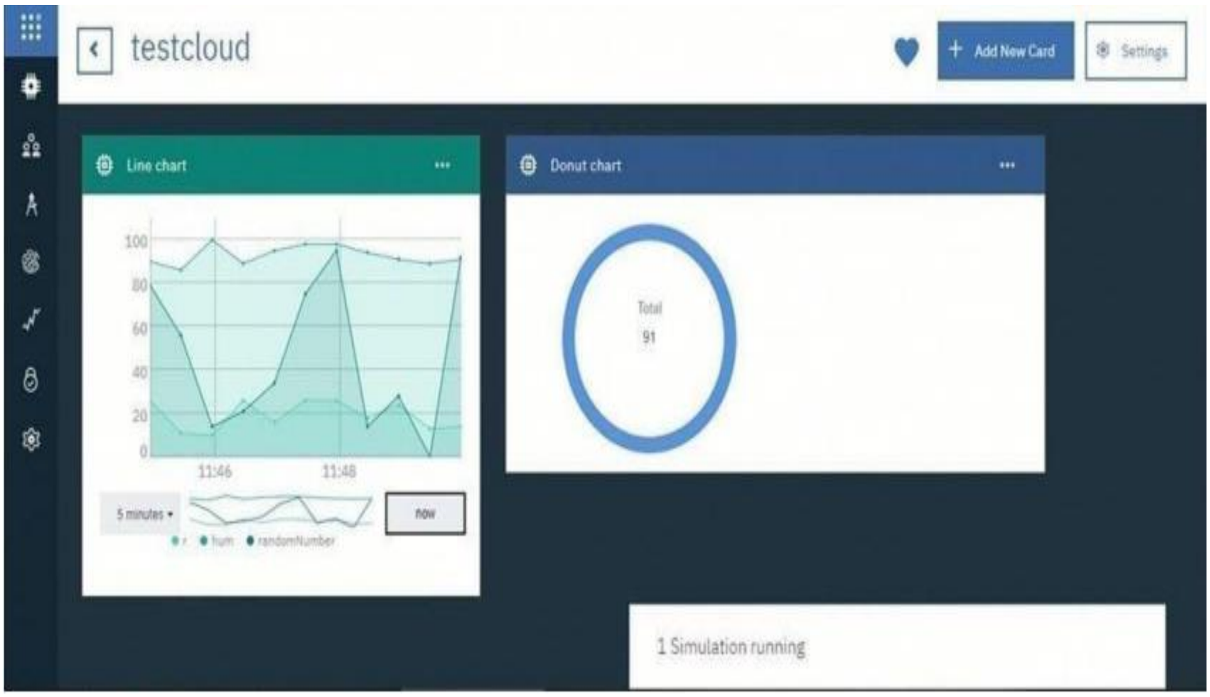
You can see the received data in graphs by creating cards in Boards tab

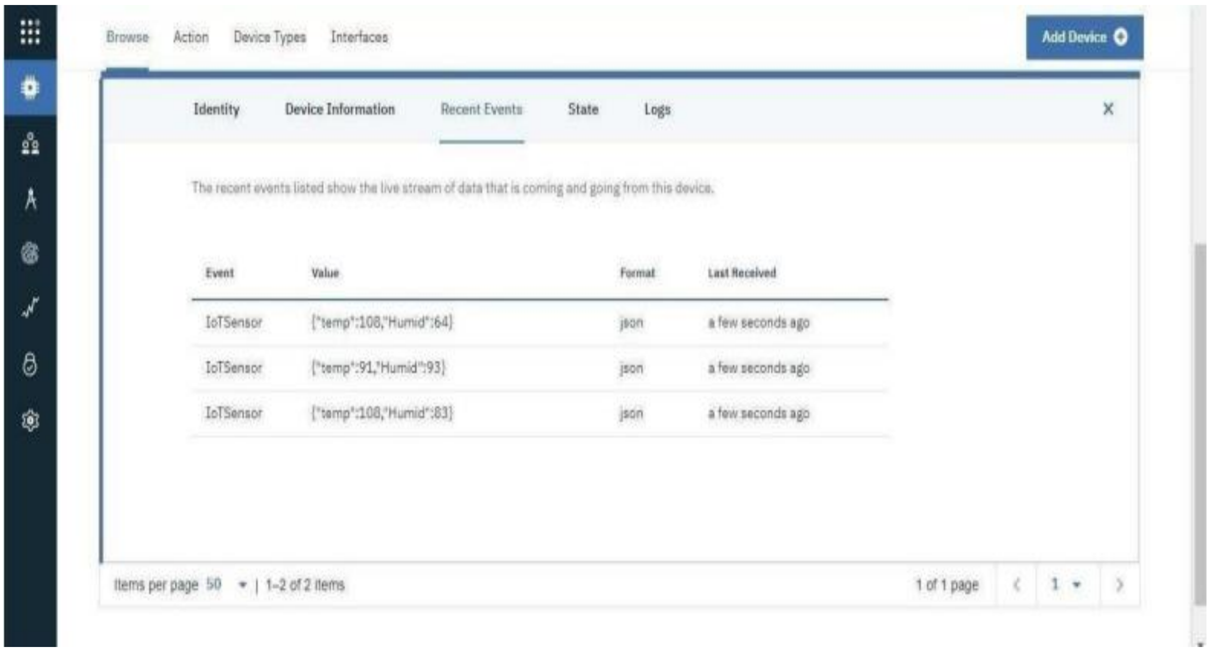
You will receive the simulator data in cloud

You can see the received data in Recent Events under your device

Data received in this format

(json) { "d": { ▪ "name": "NodeMCU", ▪ "temperature": 17, ▪ "humidity": 76, ▪ "Moisture ": 25 } }





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

Event	Value	Format	Last Received
IoTSensor	{"temp":108,"Humid":64}	json	a few seconds ago
IoTSensor	{"temp":91,"Humid":93}	json	a few seconds ago
IoTSensor	{"temp":108,"Humid":83}	json	a few seconds ago

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Configure Node-Red to IBM Cloud

The node IBM IOT App In is added to Node-Red workflow.

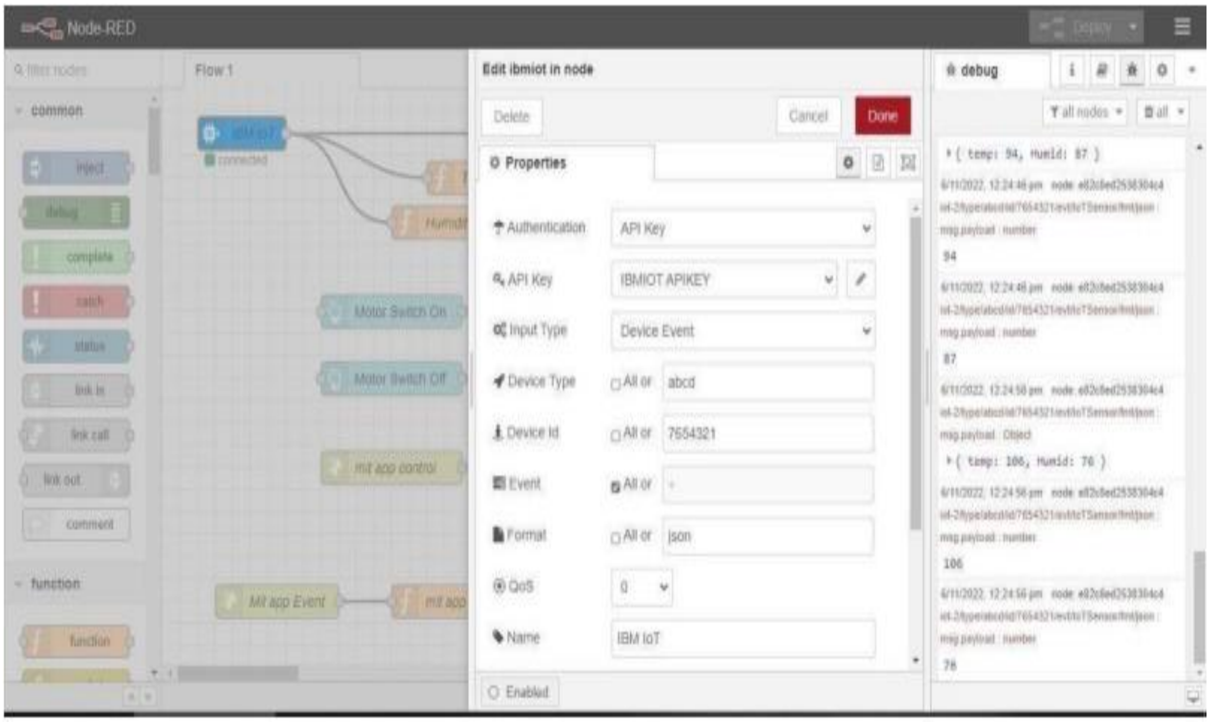
Then the appropriate device credentials obtained earlier are entered into the node to connect and fetch device telemetry to Node-Red.

Once it is connected Node-Red receives data from the device Display the data using debug node for verification Connect function node and write the Java script code to get each reading separately.

The Java script code for the function node is:

msg.payload = msg.payload.d.temperature return msg;

Finally connect Gauge nodes from dashboard to see the data in UI



Edit ibmiot in node

Properties

Authentication: API Key

API Key: IBMIOT APIKEY

Input Type: Device Event

Device Type: ☐ All or abcd

Device Id: ☐ All or 7654321

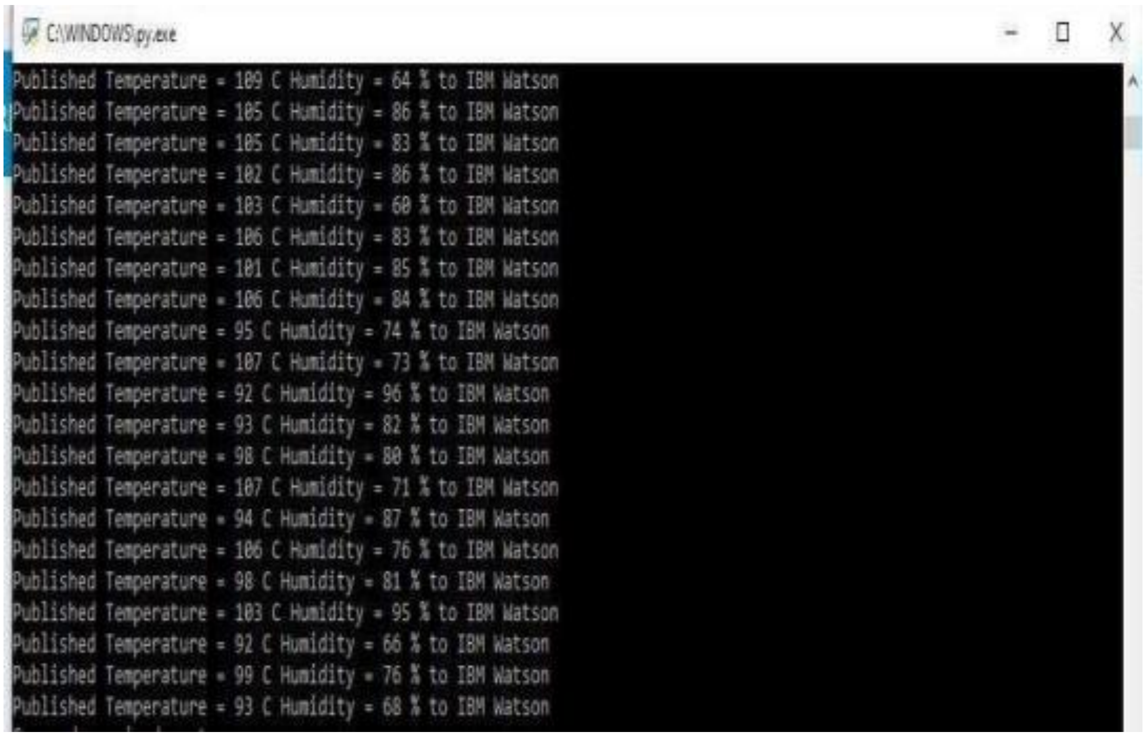
Event: ☑ All or +

Format: ☐ All or json

QoS: 0

Name: IBM IoT

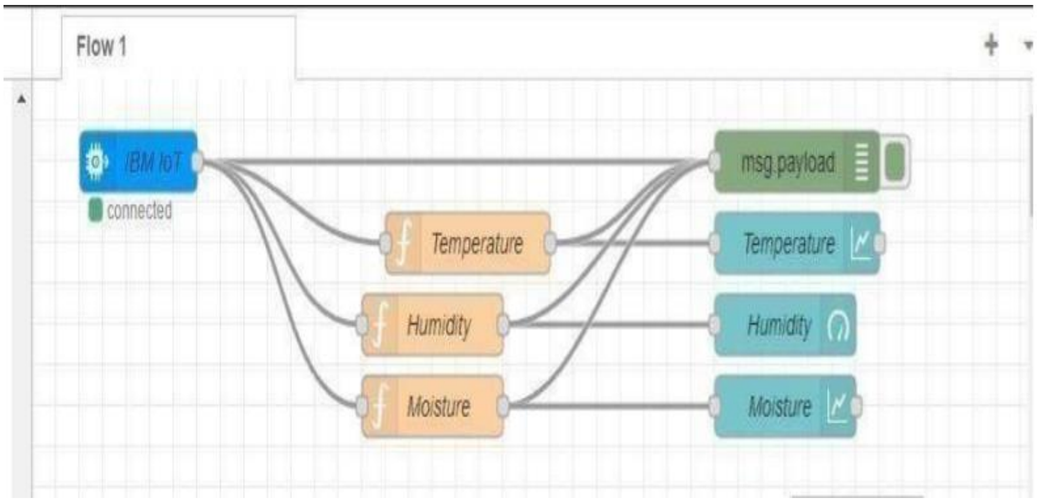
```
▸ { temp: 94, Humid: 87 }
6/11/2022, 12:24:46 pm  node: e82c8ed2538304c4
iot-2/type/abcd/id/7654321/evt/IoTSensor/fmt/json : msg.payload : number
94
6/11/2022, 12:24:46 pm  node: e82c8ed2538304c4
iot-2/type/abcd/id/7654321/evt/IoTSensor/fmt/json : msg.payload : number
87
6/11/2022, 12:24:50 pm  node: e82c8ed2538304c4
iot-2/type/abcd/id/7654321/evt/IoTSensor/fmt/json : msg.payload : Object
▸ { temp: 106, Humid: 76 }
6/11/2022, 12:24:56 pm  node: e82c8ed2538304c4
iot-2/type/abcd/id/7654321/evt/IoTSensor/fmt/json : msg.payload : number
106
6/11/2022, 12:24:56 pm  node: e82c8ed2538304c4
iot-2/type/abcd/id/7654321/evt/IoTSensor/fmt/json : msg.payload : number
76
```

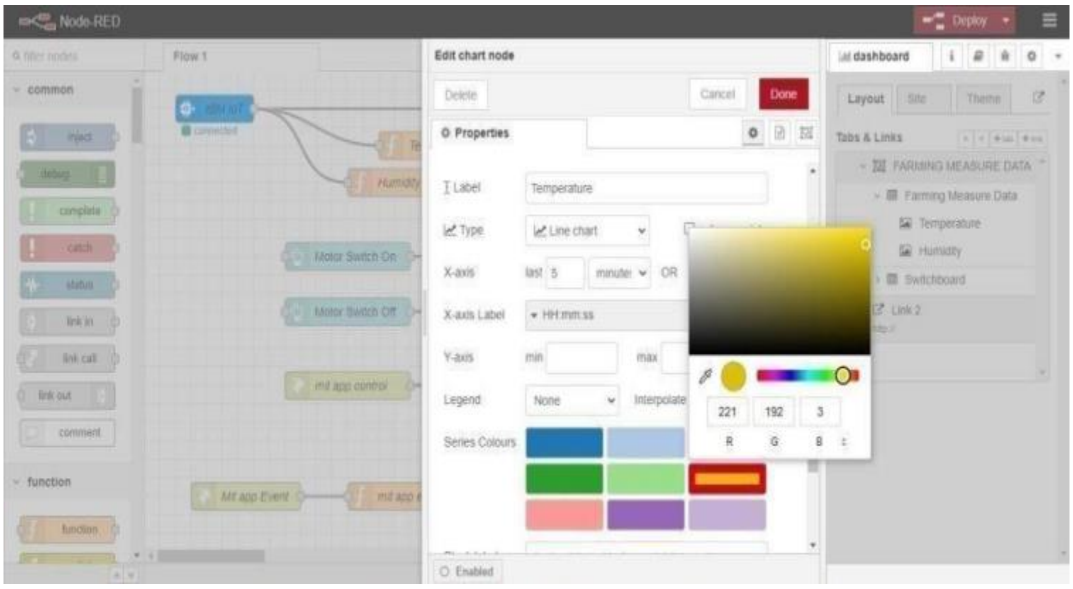


C:\WINDOWS\py.exe

```
Published Temperature = 109 C Humidity = 64 % to IBM Watson
Published Temperature = 105 C Humidity = 86 % to IBM Watson
Published Temperature = 105 C Humidity = 83 % to IBM Watson
Published Temperature = 102 C Humidity = 86 % to IBM Watson
Published Temperature = 103 C Humidity = 60 % to IBM Watson
Published Temperature = 106 C Humidity = 83 % to IBM Watson
Published Temperature = 101 C Humidity = 85 % to IBM Watson
Published Temperature = 106 C Humidity = 84 % to IBM Watson
Published Temperature = 95 C Humidity = 74 % to IBM Watson
Published Temperature = 107 C Humidity = 73 % to IBM Watson
Published Temperature = 92 C Humidity = 96 % to IBM Watson
Published Temperature = 93 C Humidity = 82 % to IBM Watson
Published Temperature = 98 C Humidity = 80 % to IBM Watson
Published Temperature = 107 C Humidity = 71 % to IBM Watson
Published Temperature = 94 C Humidity = 87 % to IBM Watson
Published Temperature = 106 C Humidity = 76 % to IBM Watson
Published Temperature = 98 C Humidity = 81 % to IBM Watson
Published Temperature = 103 C Humidity = 95 % to IBM Watson
Published Temperature = 92 C Humidity = 66 % to IBM Watson
Published Temperature = 99 C Humidity = 76 % to IBM Watson
Published Temperature = 93 C Humidity = 68 % to IBM Watson
```

Data received from the cloud in Node-R





Label Temperature
Type Line chart
X-axis last 5 minute OR
X-axis Label HH:mm:ss
Y-axis min max
Legend None Interpolate
Series Colours
R 221 G 192 B 3

This is the Java script code I written for the function node to get Temperature separately. Configuration of Node-Red to collect data from Open Weather

The Node-Red also receive data from the Open Weather API by HTTP GET request.

An inject trigger is added to perform HTTP request for every certain interval.

HTTP request node is configured with URL we saved before in section 4.4 The data we receive from Open Weather after request is in below JSON format:

{"coord":{"lon":79.85,"lat":14.13},"weather":[{"id":803,"main":"Clouds"," description":"brokenclouds","icon":"04n"}],"base":"stations","main":{"temp":307 59,"feels_like":305.5,"temp_min":307.59,"temp_max":307.59,"pressure":1002,"h umidity":35,"sea_level":1002,"grnd_level":1000},"wind":{"speed":6.23,"deg":170}

,"clouds":{"all":68},"dt":1589991979,"sys":{"country":"IN","sunrise":1589933553, "sunset":1589979720},"timezone":19800,"id":1270791,"name":"Gūdūr","cod":20 0}

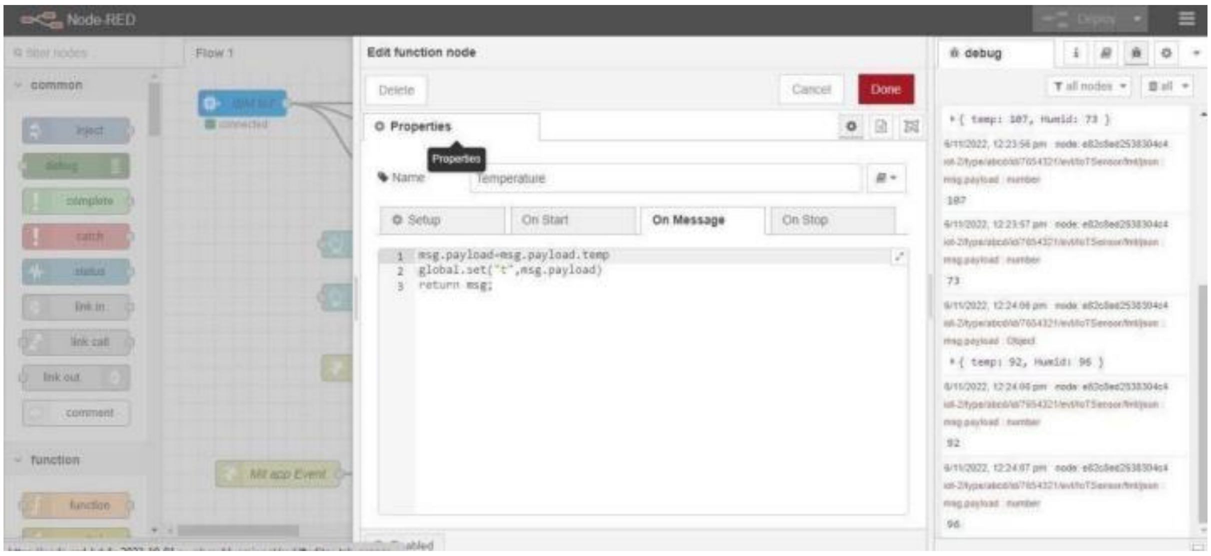
In order to parse the JSON string we use Java script functions and get each parameters

var temperature = msg.payload.main.temp;

temperature = temperature-273.15;

return {payload : temperature.toFixed(2)};

In the above Java script code we take temperature parameter into a new variable and convert it from kelvin to Celsius Then we add Gauge and text nodes to represent data visually in UI



Name: Temperature

```
msg.payload=msg.payload.temp
global.set("t",msg.payload)
return msg;
```

```
▸{ temp: 107, Humid: 73 }
6/11/2022, 12:23:56 pm  node: e82c8ed2538304c4
iot-2/type/abcd/id/7654321/evt/IoTSensor/fmt/json : msg.payload : number
107
6/11/2022, 12:23:57 pm  node: e82c8ed2538304c4
iot-2/type/abcd/id/7654321/evt/IoTSensor/fmt/json : msg.payload : number
73
6/11/2022, 12:24:06 pm  node: e82c8ed2538304c4
iot-2/type/abcd/id/7654321/evt/IoTSensor/fmt/json : msg.payload : Object
▸{ temp: 92, Humid: 96 }
6/11/2022, 12:24:06 pm  node: e82c8ed2538304c4
iot-2/type/abcd/id/7654321/evt/IoTSensor/fmt/json : msg.payload : number
92
6/11/2022, 12:24:07 pm  node: e82c8ed2538304c4
iot-2/type/abcd/id/7654321/evt/IoTSensor/fmt/json : msg.payload : number
96
```