SMART FARMER-IOT Enabled Smart Farming Application

SPRINT-03

TITLE	SMART FARMER-IOT Enabled Smart Farming Application
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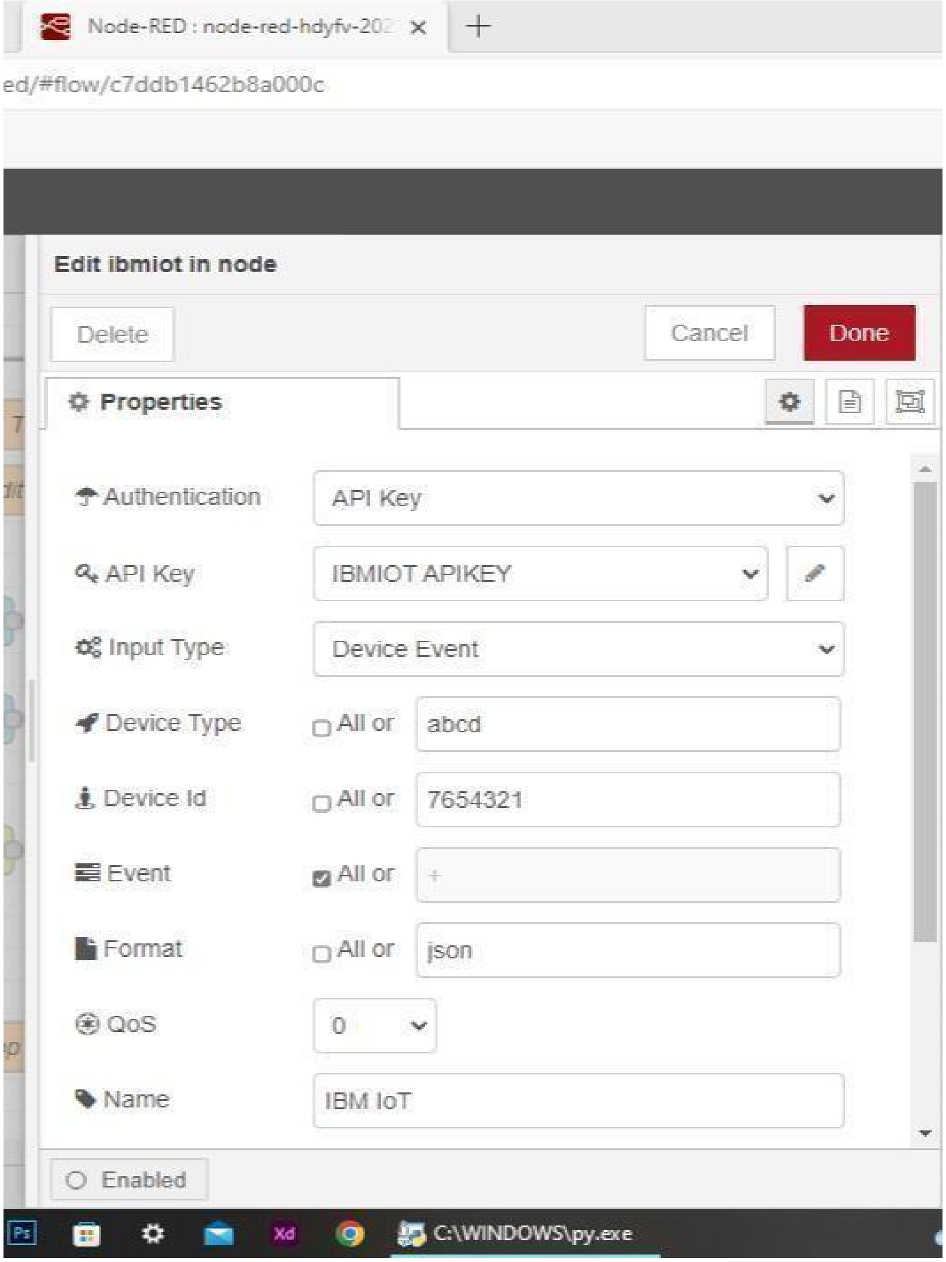
Configuration of Node-Red to send commands to IBM cloud

IBM IOT out node I used to send data from Node-Red to IBM Watson device. So, afteradding it to the flow we need to configure it with credentials of our Watson device.



Edit ibmiot in node

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

Here we add two buttons in UI

1 -> for motor

on2 -> for

motor off

We used a function node to analyses the data received and assign command toeach number.

The Java script code for the

analyses is:if(msg.payload===1)

msg.payload={"command”:

“ON"}; else if(msg.payload===0)

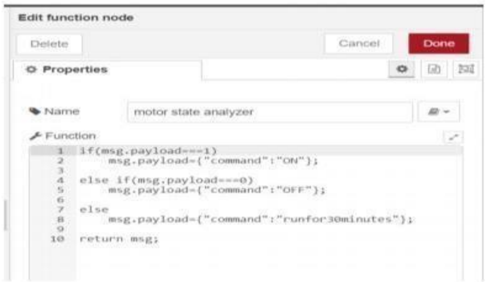
msg.payload={"command”:

“OFF"};

Then we use another function node to parse the data and get the command and represent it visually with text node.

The Java script code for that function node is:

- var state=msg.payload;
  msg.payload = state.command;
- return msg;



Name: motor state analyzer

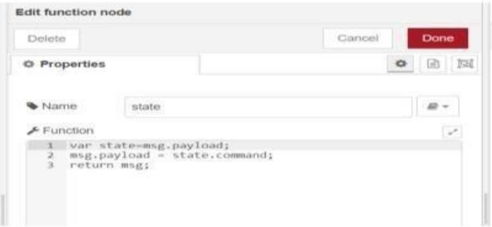
Function:

```
if(msg.payload===1)
    msg.payload={"command":"ON"};

else if(msg.payload===0)
    msg.payload={"command":"OFF"};

else
    msg.payload={"command":"runfor30minutes"};

return msg;
```



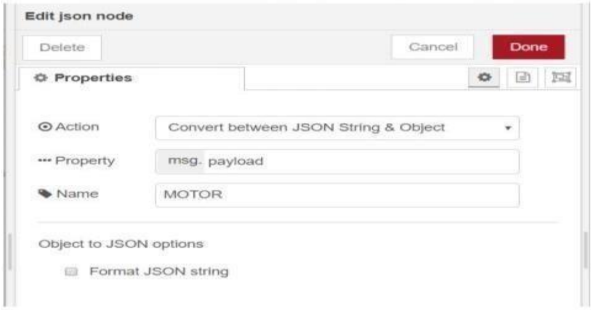
Name: state

Function:

```
var state=msg.payload;
msg.payload = state.command;
return msg;
```

The above images show the java script codes of analyser and state function nodes.

Then we add edit Json node to the conversion between JSON string & object and finally connect it to IBM IoT Out.



Action: Convert between JSON String & Object

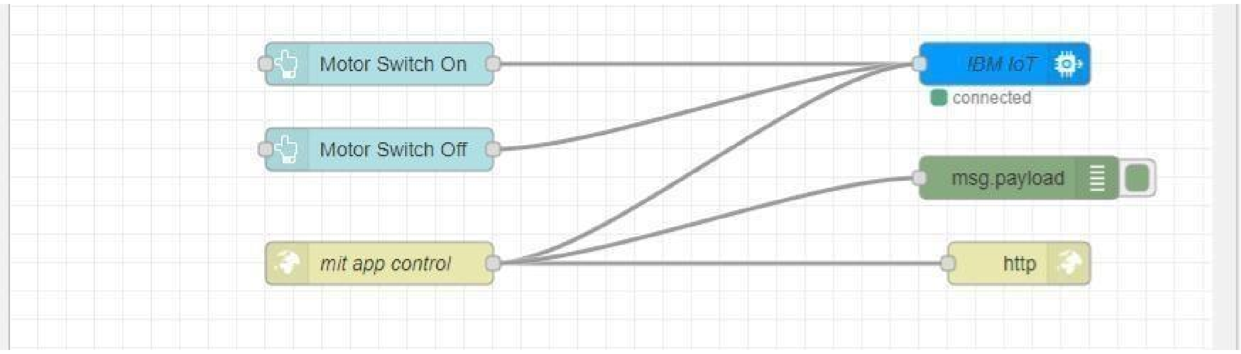
Property: msg. payload

Name: MOTOR

Object to JSON options

□ Format JSON string

Edit JSON node needs to be configured like this



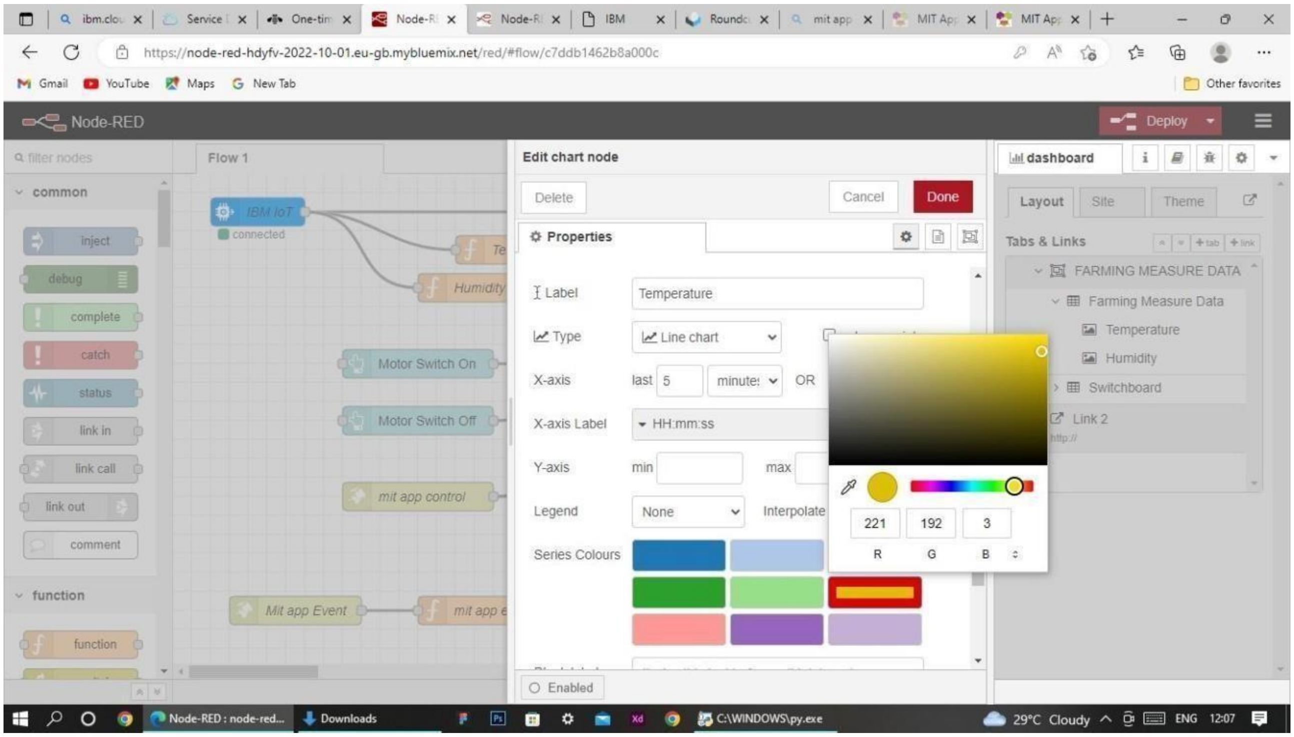
This is the program flow for sending commands to IBM cloud.

Adjusting User Interface

In order to display the parsed JSON data a Node-Red dashboard is created

Here we are using Gauges, text and button nodes to display in the UI and helps tomonitor the parameters and control the farm equipment.

Below images are the Gauge, text and button node configurations.



Edit chart node

Delete Cancel Done

Properties

Label Temperature

Type Line chart

X-axis last 5 minute OR

X-axis Label HH:mm:ss

Y-axis min max

Legend None

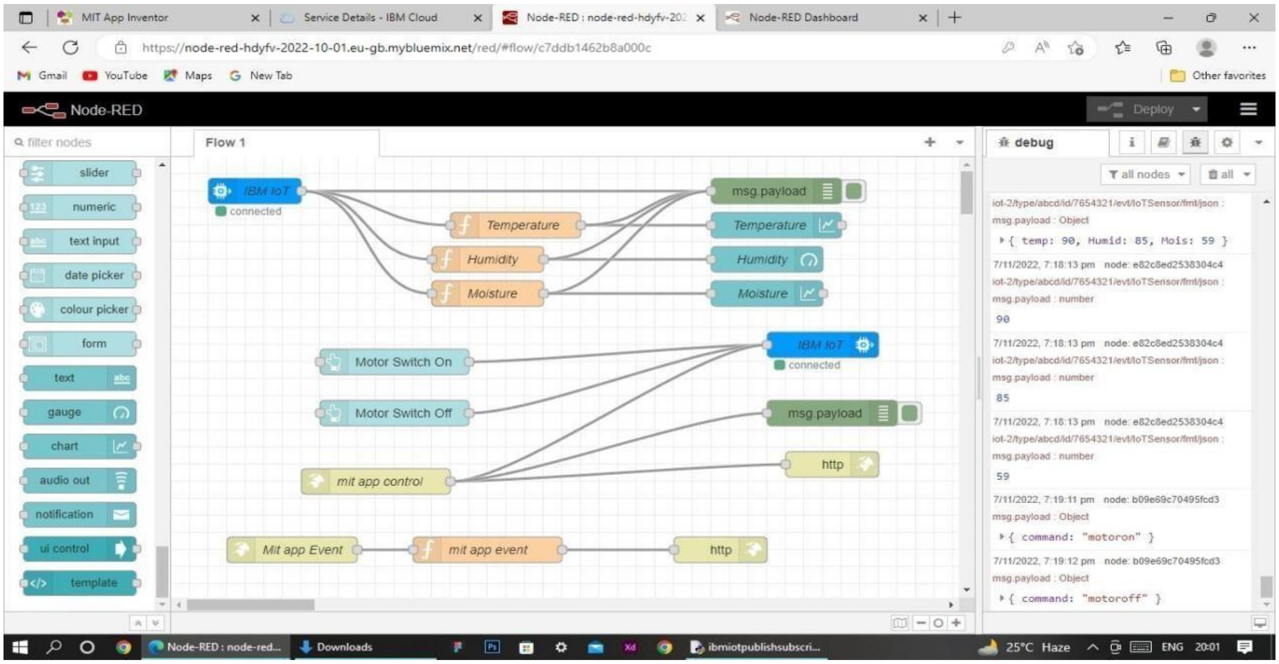
Interpolate

Series Colours

R 221 G 192 B 3

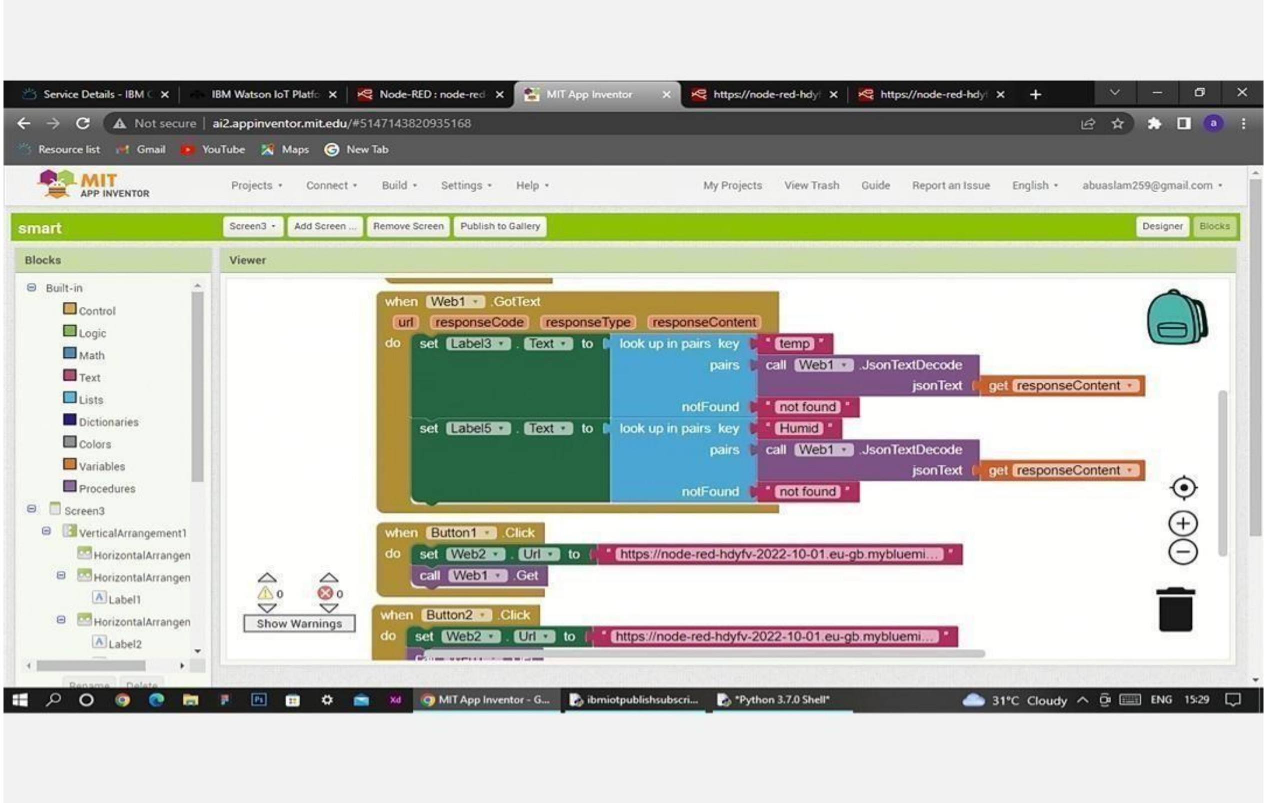
○ Enabled

Complete Program Flow



```
iot-2/type/abcd/id/7654321/evt/IoTSensor/fmt/json :
msg.payload : Object
▸{ temp: 90, Humid: 85, Mois: 59 }
7/11/2022, 7:18:13 pm   node: e82c8ed2538304c4
iot-2/type/abcd/id/7654321/evt/IoTSensor/fmt/json :
msg.payload : number
90
7/11/2022, 7:18:13 pm   node: e82c8ed2538304c4
iot-2/type/abcd/id/7654321/evt/IoTSensor/fmt/json :
msg.payload : number
85
7/11/2022, 7:18:13 pm   node: e82c8ed2538304c4
iot-2/type/abcd/id/7654321/evt/IoTSensor/fmt/json :
msg.payload : number
59
7/11/2022, 7:19:11 pm   node: b09e69c70495fcd3
msg.payload : Object
▸{ command: "motoron" }
7/11/2022, 7:19:12 pm   node: b09e69c70495fcd3
msg.payload : Object
▸{ command: "motoroff" }
```

MOBILE APP WEB :

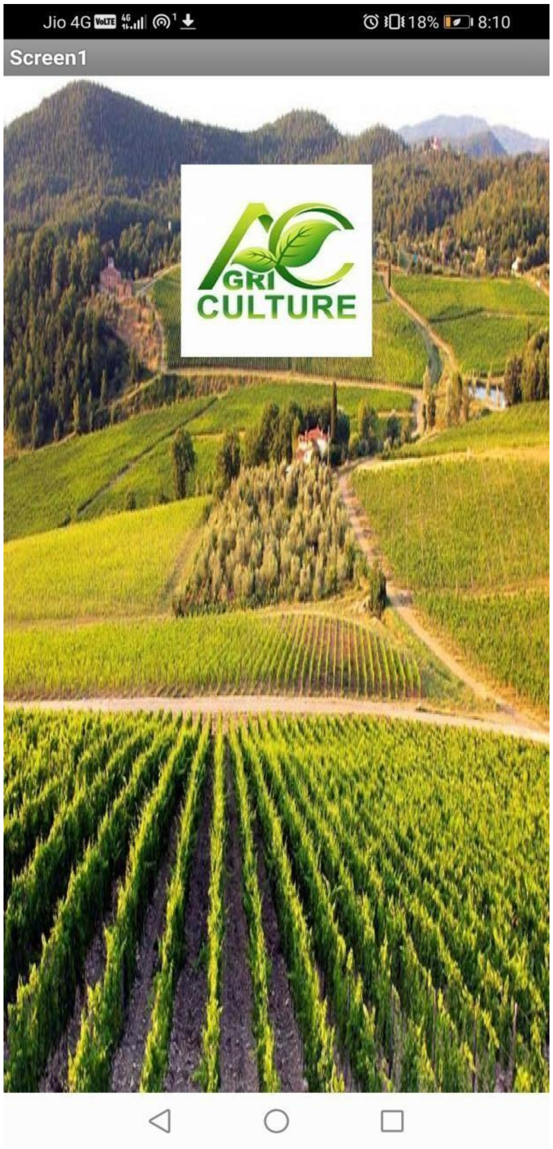


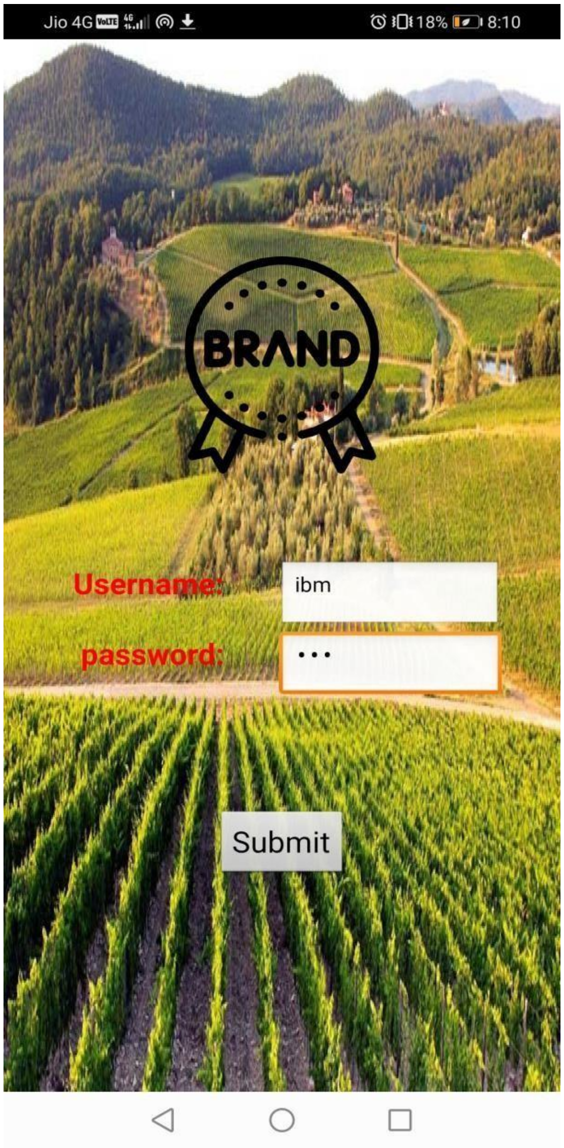
```
when Web1 .GotText
  url  responseCode  responseType  responseContent
do  set Label3 . Text to  look up in pairs  key " temp "
                                            pairs  call Web1 .JsonTextDecode
                                                                jsonText  get responseContent
                                            notFound " not found "
    set Label5 . Text to  look up in pairs  key " Humid "
                                            pairs  call Web1 .JsonTextDecode
                                                                jsonText  get responseContent
                                            notFound " not found "

when Button1 .Click
do  set Web2 . Url to " https://node-red-hdyfv-2022-10-01.eu-gb.mybluemi... "
    call Web1 .Get

when Button2 .Click
do  set Web2 . Url to " https://node-red-hdyfv-2022-10-01.eu-gb.mybluemi... "
```

BLOCK DIAGRAM



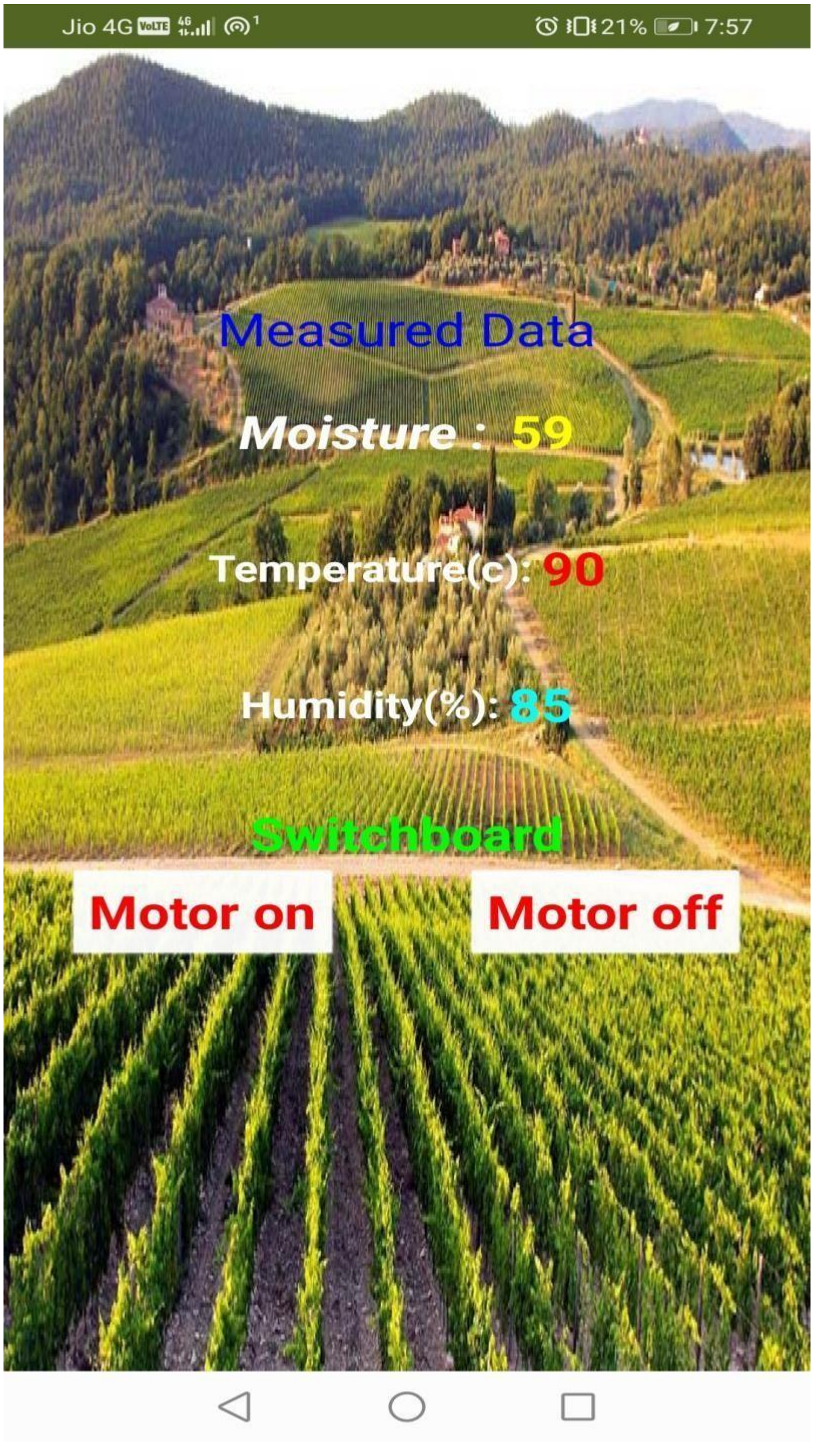


Username: ibm

password: •••

SCREEN – 1

SCREEN - 2



Measured Data

Moisture : 59

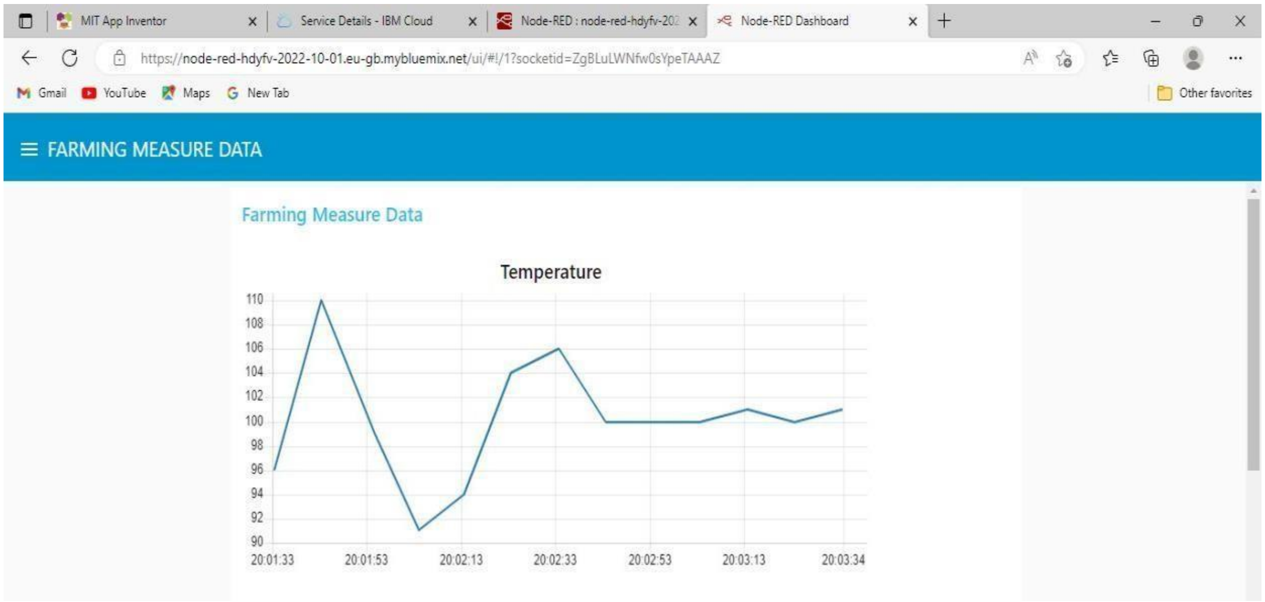
Temperature(c): 90

Humidity(%): 85

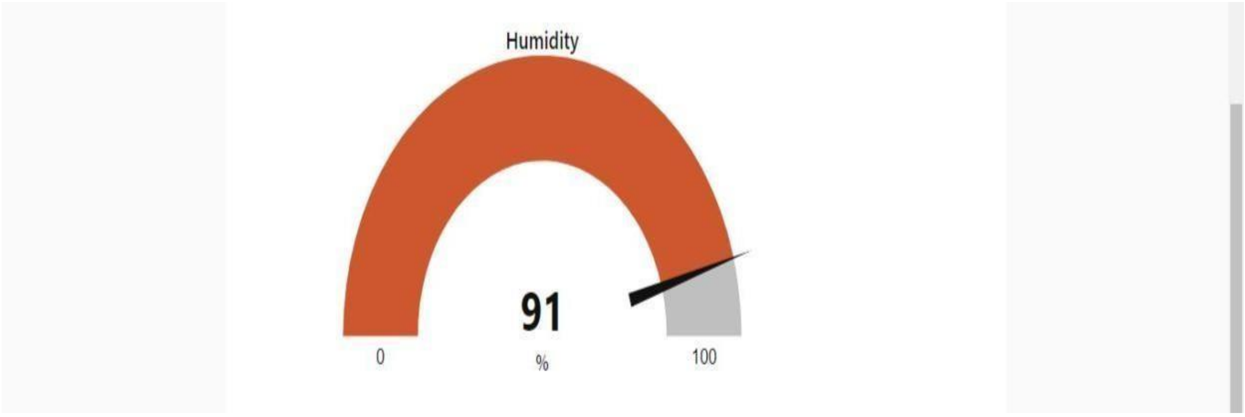
SCREEN - 3

Web APP UI Home Tab Output

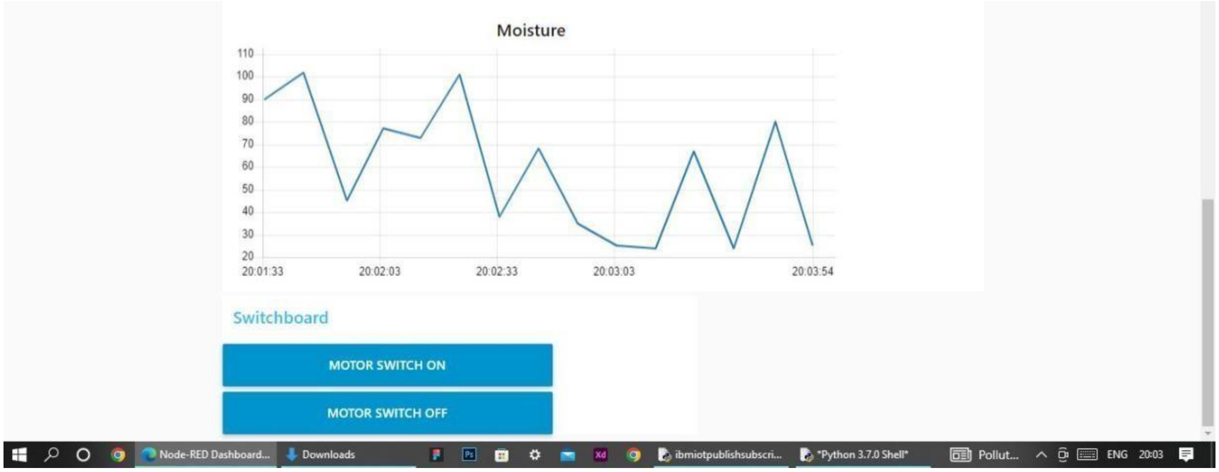
TEMPERATURE



HUMIDITY



MOISTURE


Moisture
110
100
90
80
70
60
50
40
30
20
20:01:33
20:02:03
20:02:33
20:03:03
20:03:54
Switchboard
MOTOR SWITCH ON
MOTOR SWITCH OFF
Node-RED Dashboard...
Downloads
ibmiotpublishsubscri...
Python 3.7.0 Shell
Pollut...
ENG
20:03