Smart Agriculture system based on IoT - SB12663 (Project Report)

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Domain	IoT

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. INTRODUCTION

1.1 Overview:

We will be able to create an application for Smart Agriculture System based on IoT can monitor soil moisture and climatic conditions to grow and yield a good crop by using Discovery , Assistant, Cloud function and Node Red). By the end of the project, we'll learn best practices of combining Watson services, and how they can build interactive information retrieval systems with python and Node Red

Project Requirements: Python, IBM Cloud, IBM Watson,Node- RED

- Functional Requirements: IBM cloud
- Technical Requirements: IBM IoT platform,WATSON AI,PYTHON
- Software Requirements: Watson assistant, Watson discovery,Node-RED.
- Project Deliverables: Smartinternz Intership
- Project Team: VIGNESHKUMAR R
- Project Duration:30 days

1.2 Purpose:

Farmer is provided a mobile app using which he can monitor the temperature,humidity and soil moisture parameters along with weather forecasting details.

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2.LITERATURE SURVEY

2.1 Existing problem:

Normally farmer are very diffcult to control the motor that is swith ON and switch OFF, so we made an User Interface (UI) which is used to control motor wireless by the help of Internet of Things(IoT).

2.2 Proposed solution:

We are using IBM IoT platform where the device is created and named as "NodeMCU" which can be auttenticate by the organistaion ID , Device Type, Device ID, Auttentication token in the IoT sensor Bluemex page.In the IoT sensor page ,We use Temperature and Humidity sensors data are transfered to IBM IoT platform which is also transfered to Node-Red .By the help of ibmsubscribe.py (Python code) to get the control from Node-Red.

In Watson IoT Sensor Simulation, where 12345 is my device ID which is connected to my IBM cloud. In this page , Temperature and Humidity are controlled and data is transfered for further process.In the below diagram, UP and DOWN arrow is used to control the Temperature and Humidity .

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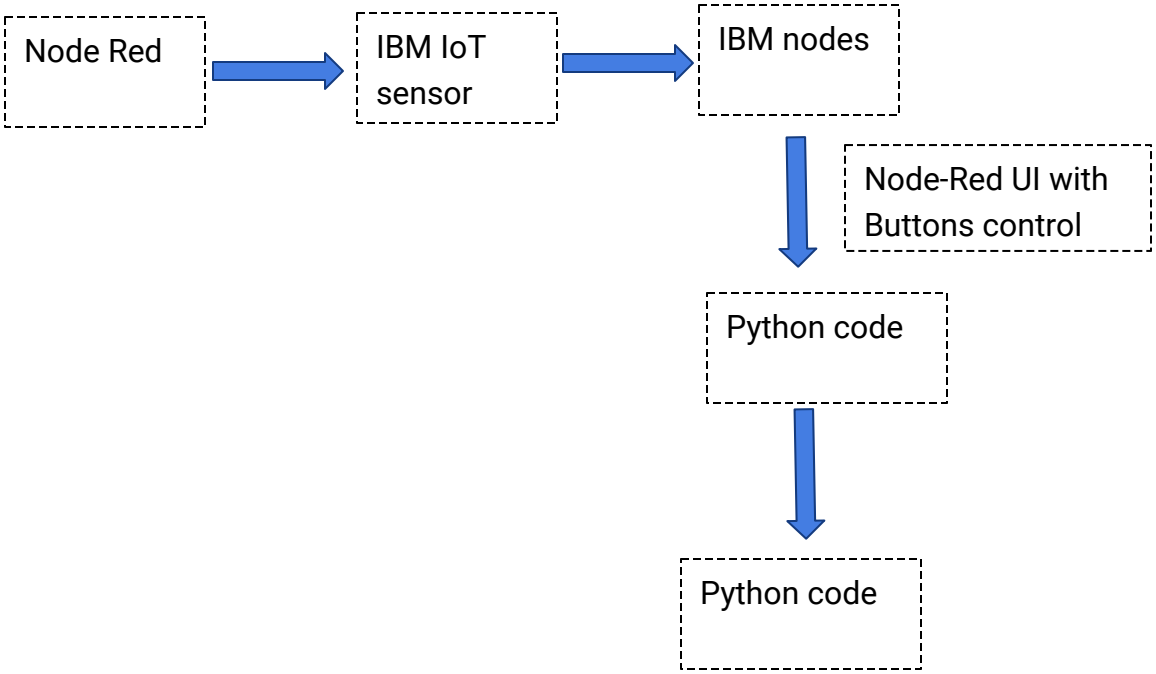
3.THEORITICAL ANALYSIS

3.1 Block Diagram:

This below Block diagram is used to understand the process



3.2 Hardware / Software designing:

1. Installing Node-Red
2. Create IBM Cloud services
3. Configure Watson Discovery
4. Create IBM IoT platform

5. Configure Watson Assistant
6. Create flow and configure node
7. Deploy and run Node Red app.
8. Change the python code and run the module.

4.EXPERIMENTAL INVESTIGATIONS

Create IBM Cloud services and Node-Red

Following services are created :

- Watson Assistant
- Node Red
- IBM cloud function

Creation of Node-RED in My computer :

- Step-1: Installing Nodejs and using command to install Node-Red.
- Step-2: Installing the IBM nodes and Dashboard in Node-Red.
- Step-3: Connect the IBM out to functions by using Generated API.
- Step-4: Using "msg.payload" to see the current output of specific function in Debug window option.

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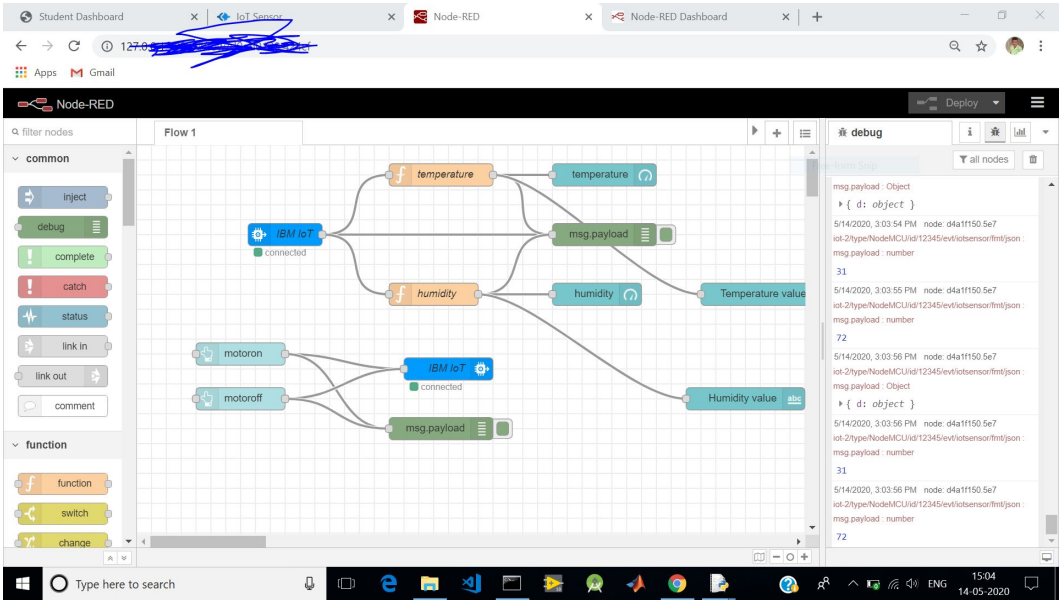

where I am hiding my local server host ip address

Device credentials

- **Organization ID :** 13sbsg
- **Device Type:** NodeMCU
- **Device ID:** 12345
- **Authentication Method:** use-token-auth
- **Authentication Token:** 5e9bd0051f9677c5f640552b15de828e

5.FLOW CHART

Node-Red code by "Export" option

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6.RESULTS

Thus the below figure A shown that gauge value of Humidity and

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Temperature and which is also used to display the values in both analog and digital format.

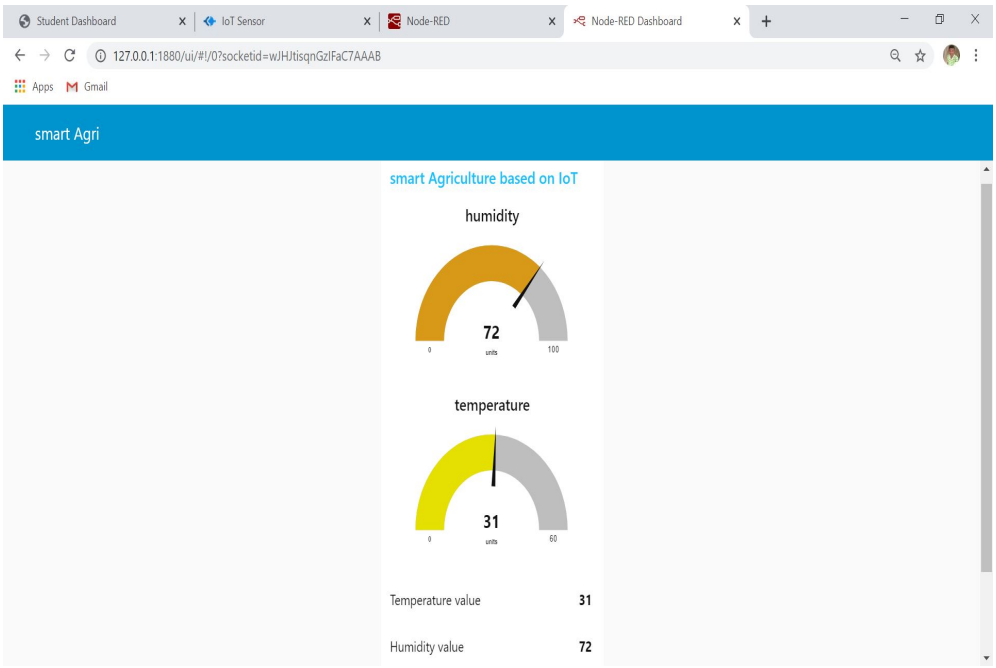

Figure A

In Figure B,which is shown the Motor ON and Motor OFF button to control the Motor

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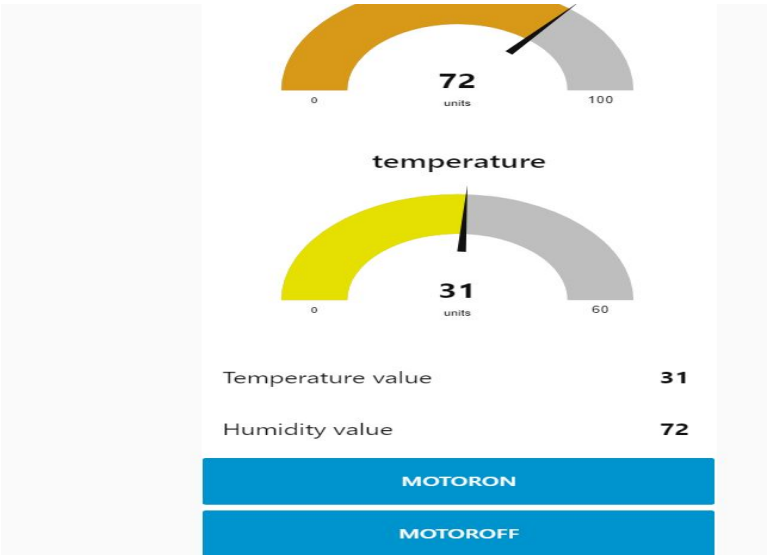

Figure B

In Figure C, which shown the "MOTOR ON is RECEIVED" when I clicked Motor ON button in UI , "MOTOR OFF is RECEIVED" when I clicked Motor OFF button in UI.

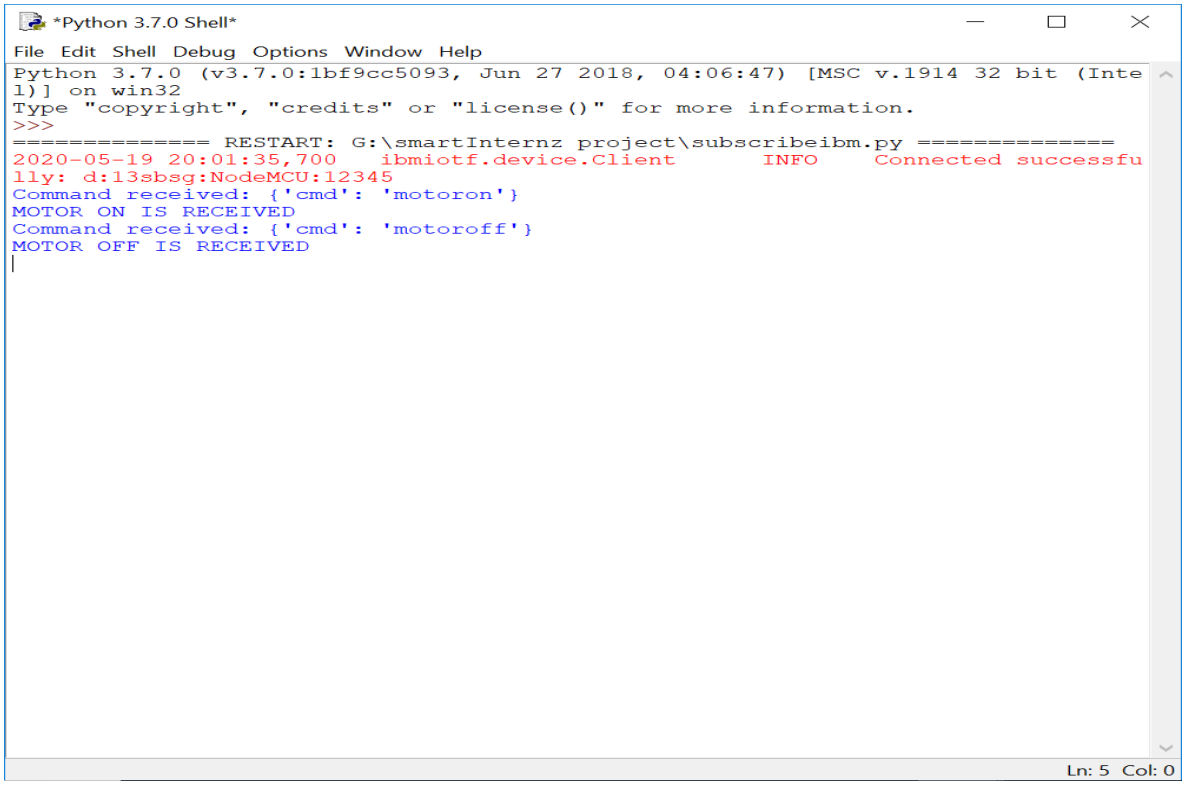

Figure C

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7.ADVANTAGES & DISADVANTAGES

Advantages:

- Reduces man power .
- Time is reduced.
- Use anytime and anywhere.

Disadvantages:

- Depends on Internet.
- Some times error due API auttentication.
- Some times cannot connect to python chell due to some external factors.

8.APPLICATIONS

- Used to Mointor the temperature and Humidity .
- used for real time mointoring.

9.CONCLUSION

By doing the above procedure and all we successfully created Smart agriculture based on IoT, Node-RED and cloud-functions.

10.FUTURE SCOPE

We can include button control to control all appliction wireless method. This is one of the future scope of this project.

11. BIBILOGRAPHY

APPENDIX

A.Source code:

[{"id":"d9ad0139.424cf","type":"tab","label":"Flow 1","disabled":false,"info":""},{"id":"348ae716.5550d8","type":"ui_group","z":"","name":"smart

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    "targetType": "msg",
    "x": 410,
    "y": 380,
    "wires": []
  },
  {
    "id": "fd5f9911.97bba8",
    "type": "ui_text",
    "z": "d9ad0139.424cf",
    "group": "348ae716.5550d8",
    "order": 3,
    "width": 0,
    "height": 0,
```

```
    "name": "",
    "label": "Temperature value",
    "format": "{{msg.payload}}",
    "layout": "row-spread",
    "x": 850,
    "y": 200,
    "wires": []
},
{
    "id": "25a23c3.91b22c4",
    "type": "ui_text",
    "z": "d9ad0139.424cf",
    "group": "348ae716.5550d8",
    "order": 4,
    "width": 0,
    "height": 0,
    "name": "",
    "label": "Humidity value",
    "format": "{{msg.payload}}",
    "layout": "row-spread",
    "x": 820,
    "y": 340,
    "wires": []
},
{
    "id": "47732193.a829a",
    "type": "ibmiot",
    "z": "",
    "name": "",
    "keepalive": "60",
    "serverName": "13sbsg.messaging.internetofthings.ibmcloud.com",
    "cleansession": true,
    "appId": "",
    "shared": false
},
```

```
    {
        "id": "348ae716.5550d8",
        "type": "ui_group",
        "z": "",
        "name": "smart Agriculture based on IoT",
        "tab": "bc273d93.406fe",
        "order": 1,
        "disp": true,
        "width": "6",
        "collapse": false
    },
    {
        "id": "bc273d93.406fe",
        "type": "ui_tab",
        "z": "",
        "name": "smart Agri",
        "icon": "dashboard",
        "disabled": false,
        "hidden": false
    }
]
```