PROJECT REPORT

Title : Smart Agriculture System Based On IoT

duration : 30 days

by

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ACKNOWLEDGEMENT

We students of B-Tech 3rd year, eletronics and communication Engineering, have successfully completed the project under the guidance of esteemed faculties of smartbridge.

We would like to thank Mr.Durga prasad for his valuable guidance and advice in completion of our project and providing me all possible assistance. he has been extremely motivating and helps us during the project work. I am also grateful to his for providing us necessary references.

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ABSTRACT :

Internet of Things (IoT) technology has brought revolution to each and every field of common man's life by making everything smart and intelligent. IoT refers to a network of things which make a self-configuring network. The development of Intelligent Smart Fagriculture IoT based devices is day by day turning the face of agriculture production by not only enhancing it but also making it cost-effective and reducing wastage. The aim / objective of this project is IoT based Smart Farming System assisting farmers in getting Live Data (Temperature, Soil Moisture) for efficient environment monitoring which will enable them to increase their overall yield and quality of products. The IoT based Smart Farming System being proposed via this report is integrated with IOT Technology mixed with different Sensors and a producing live data feed that can be obtained online from virtual simulator.

1.INTRODUCTION :-

1.1 OVERVIEW:

Basically the project is about crreating a smart web application using IOT.The main motive for this project is to help the farmers to yeild good because farmers are losing their money for bad climatic conditions. so ,this web application provides the exact conditions in the field and weather conditions of their location.so that farmers can act according to the climate by means of controlling the motor to maintain exact soil moisture.

- Smart Agriculture System based on IoT can monitor soil moisture and climatic conditions to grow and yield a good crop.
- The farmer can also get the realtime weather forecasting data by using external platforms like Open Weather API.
- Farmer is provided a mobile app using which he can monitor the temperature,humidity and soil moisture parameters along with weather forecasting details.
- Based on all the parameters he can water his crop by controlling the motors using the mobile application.
- Even if the farmer is not present near his crop he can water his crop by controlling the motors using the mobile application from anywhere.
- Here we are using the Online IoT simulator for getting the Temperature,Humidity and Soil Moisture values.

1.2 IOT IN AGRICULTURE :

- IoT enables easy collection and management of tons of data collected from sensors and with integration of cloud computing services like Agriculture fields maps, cloud storage etc., data can be accessed live from anywhere and everywhere enabling live monitoring and end to end connectivity among all the parties concerned.

- IoT is regarded as key component for Smart Farming as with accurate sensors and smart equipment's, farmers can increase the food production by 70% till year 2050 as depicted by experts.

- With IOT effective level of usage of soil,water and pesticides increases.

- With IOT various factors would leads to protection of environment.

2.**PROJECT REQUIREMENTS:**

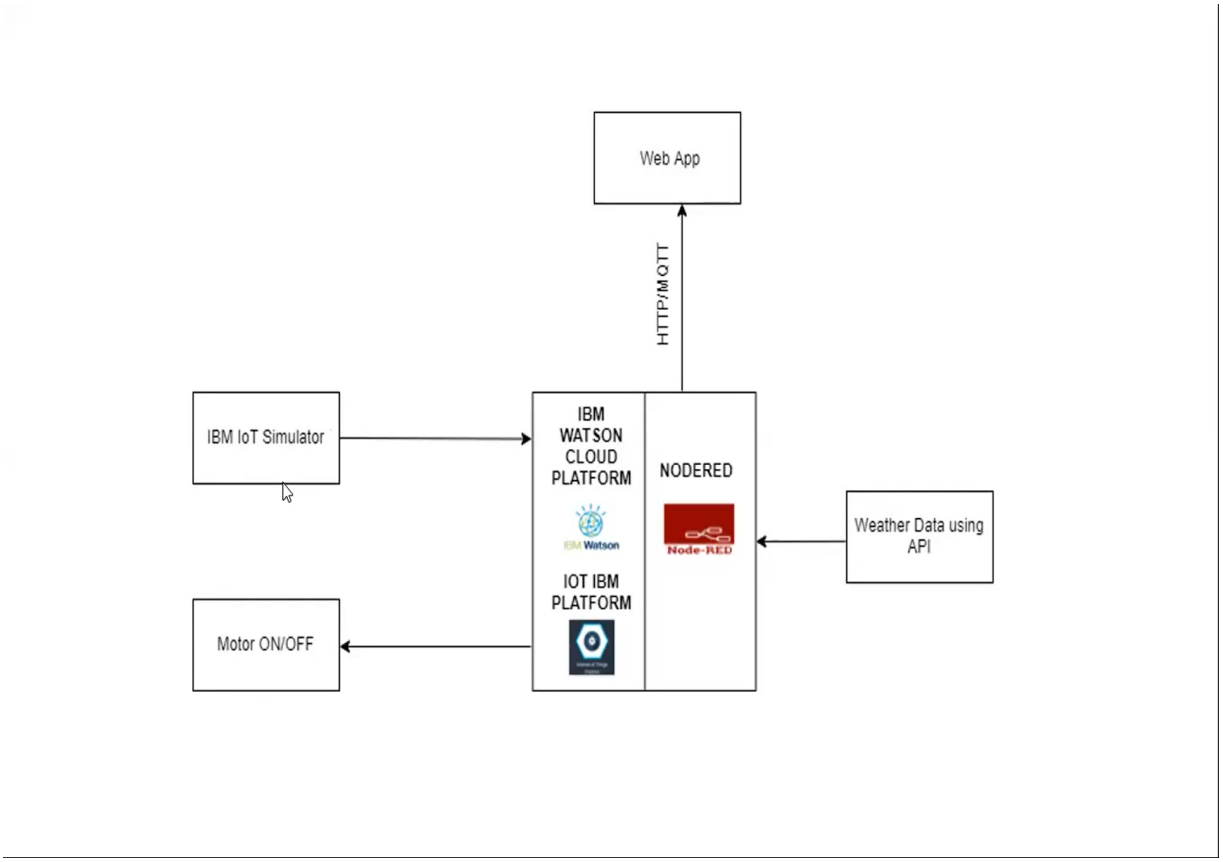
- IBM cloud account
- Bluemix account in cloud
- NodeRED deployment
- Python coding
- IOT simulator
- Open Weather API

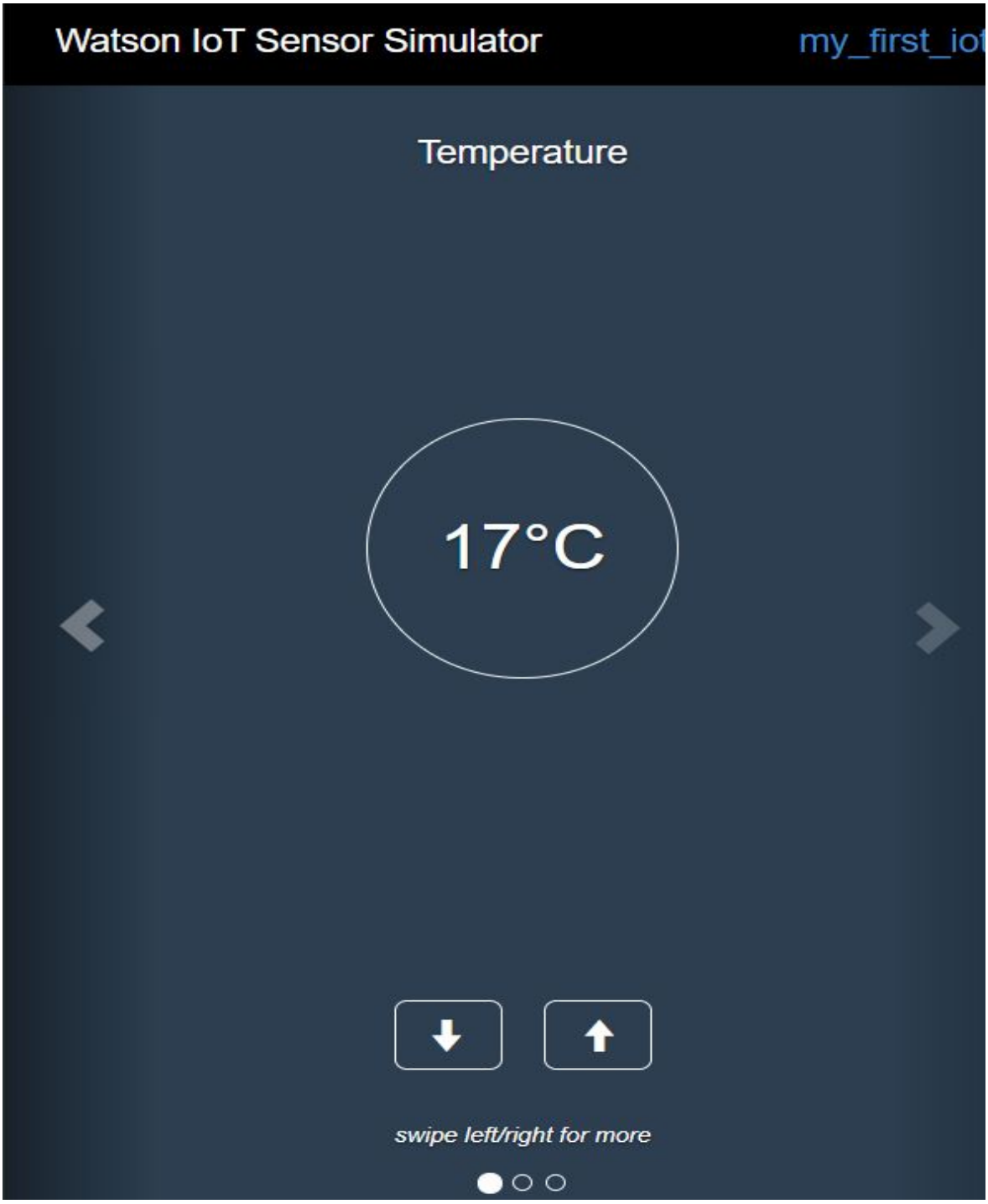
3.PROJECT PROCEDURE:-

- Firstly, we have to create IBM cloud account and create IBM watson IOT service

and create bluemix account in IOT platform.

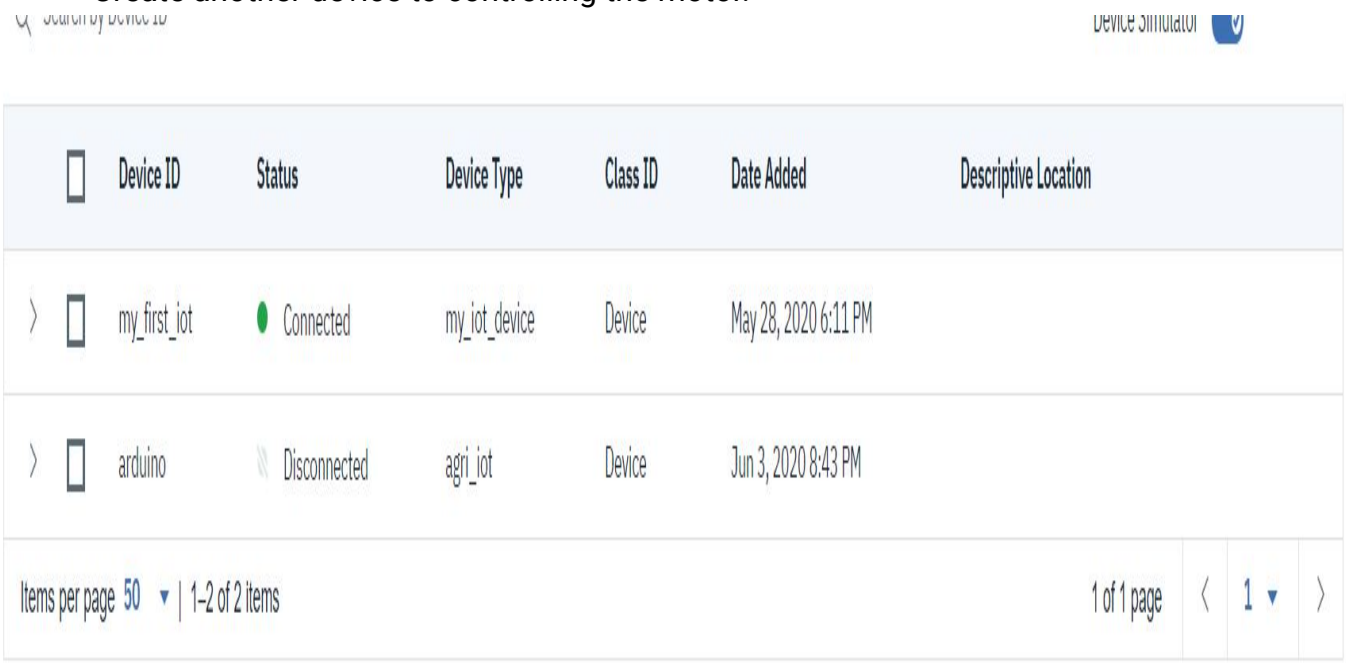
- In the field we have to obtain values of temperature,humidity and soil moisture.
- We are virtually simulating these values using IBM IOT simulator.



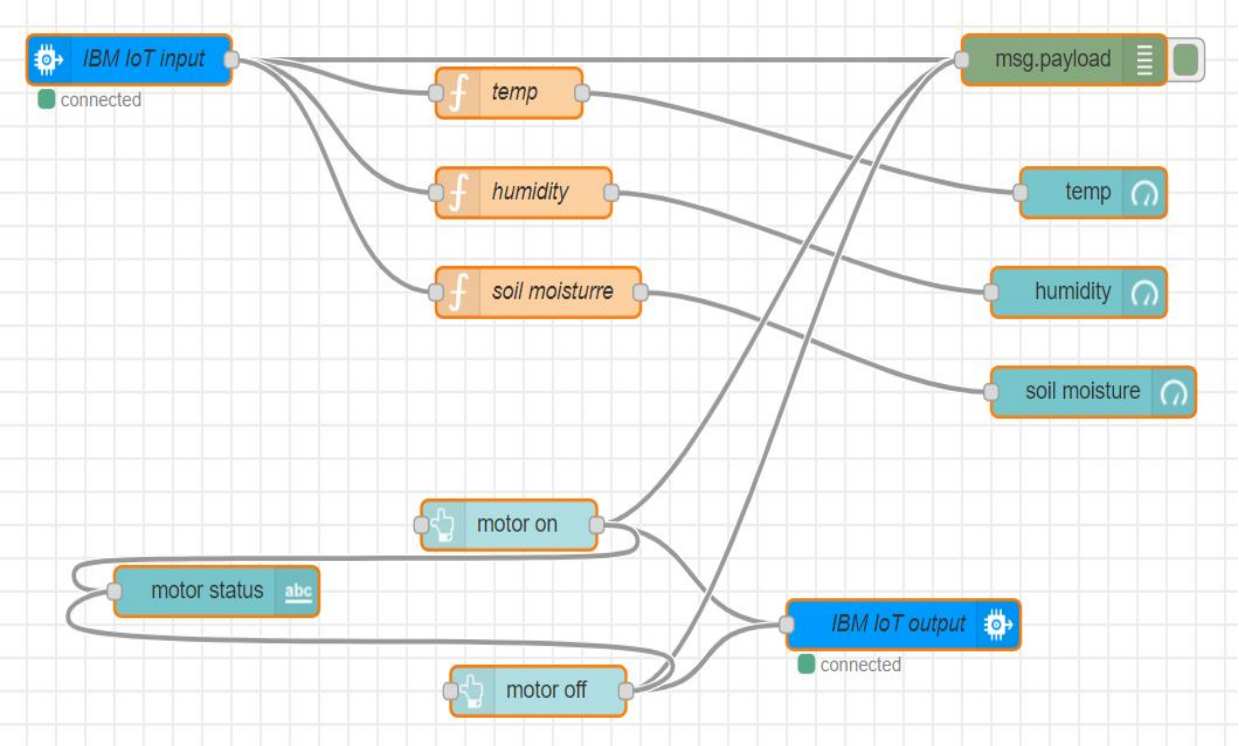


- In IOT platform we have to create a device to get values from IOT simulator.
- We prepare 3 cards for temperture, humidity and soil moisture.
- We have to create an API key .

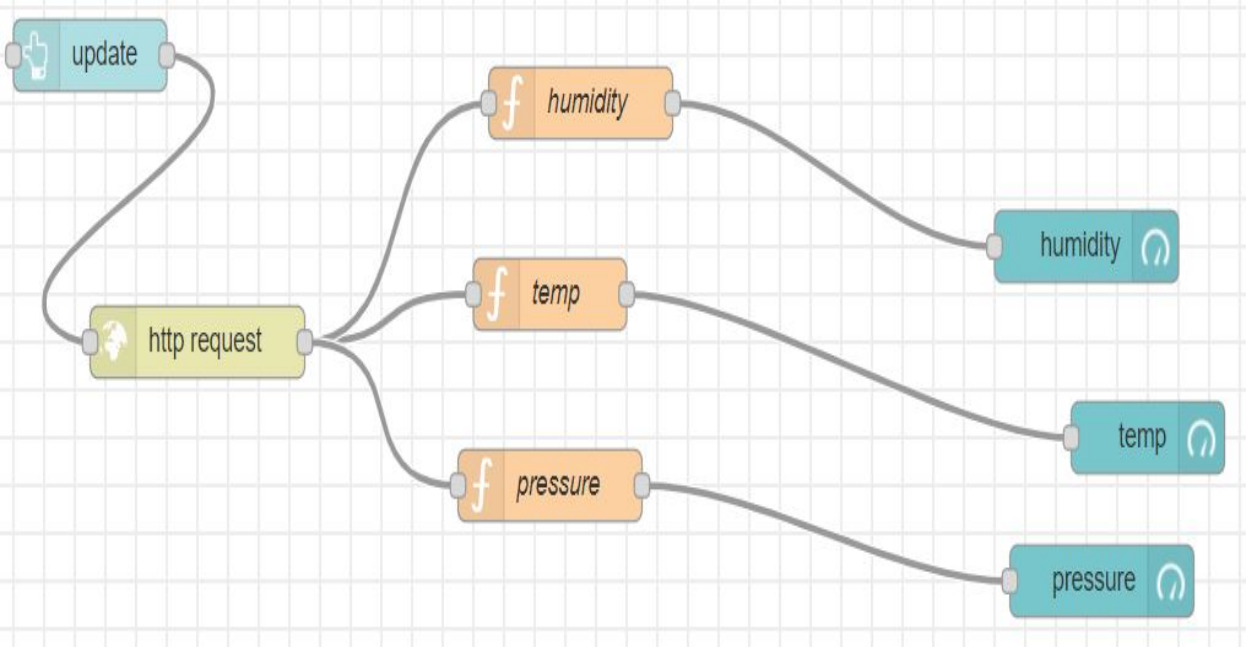
- Connect the created device to IBM IOT simulator to get the data.
- Create another device to controlling the motor.



- We can continuosly simulate the data in platform itself using simulator.
- we can see the device whether it is connected or not.
- Now we have to build the dashboard using nodered.
- We have to install nodered locally and to build dashboard we have to install nodered dashboard using manage pallete.
- We have to install IBM nodes to connect through IBM cloud.
- We have to connect IBM input node to first device and IBM output node to motor controlling device.



- The above nodered flow shows the dashboard for feild conditions.
- In the dashboard we have motor on and motor off buttons which are connected to the motor controling device which controls the motor.
- we have to connect to three function nodes i.e temp, humidity, soil moisture to the ibm input node.
- Now we have to get the weather conditions of the location.so we have to create an account in open weather API.
- We have to get the url which has weather conditions of the location.
- Below nodered flow represents the dashboard for weather conditions.



- Here we used update button for update present climatic condition.
- The data transfer from IOT simulator to cloud device is based on MQTT .
- Data transfer from open weather API to nodered is based HTTP.

4.<u>PYTHON CODE</u> :

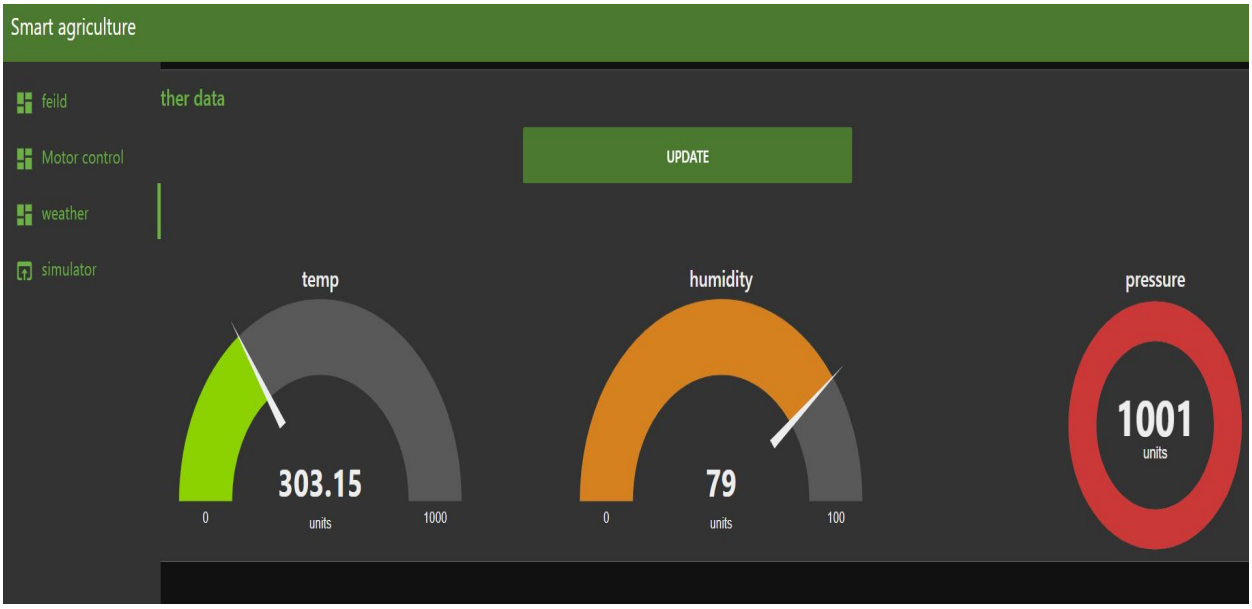
```
import time
import sys
import ibmiotf.application # to install pip install ibmiotf
import ibmiotf.device

#Provide your IBM Watson Device Credentials
organization = "e2prh7" #replace the ORG ID
deviceType = "agri_iot"#replace the Device type wi
deviceId = "arduino"#replace Device ID
authMethod = "token"
authToken = "7f+uMz?7lrC**Y)kEa" #Replace the authtoken

def myCommandCallback(cmd): # function for Callback
        print("Command received: %s" % cmd.data)
```

```
        if cmd.data['command']=='motoron':
                print("MOTOR ON IS RECEIVED")

        elif cmd.data['command']=='motoroff':
                print("MOTOR OFF IS RECEIVED")

        if cmd.command == "setInterval":

                if 'interval' not in cmd.data:
                        print("Error - command is missing required information: 'interval'")
                else:
                        interval = cmd.data['interval']
        elif cmd.command == "print":
                if 'message' not in cmd.data:
                        print("Error - command is missing required information: 'message'")
                else:
                        output=cmd.data['message']
                        print(output)

try:
                                        deviceOptions = {"org": organization, "type": deviceType,
"id": deviceId, "auth-method": authMethod, "auth-token": authToken}
                                        deviceCli = ibmiotf.device.Client(deviceOptions)
                                        #.....................................

except Exception as e:
                                        print("Caught exception connecting device: %s" %
str(e))
                                        sys.exit()

# Connect and send a datapoint "hello" with value "world" into the cloud as an event of
type "greeting" 10 times
deviceCli.connect()

while True:

        deviceCli.commandCallback = myCommandCallback
```

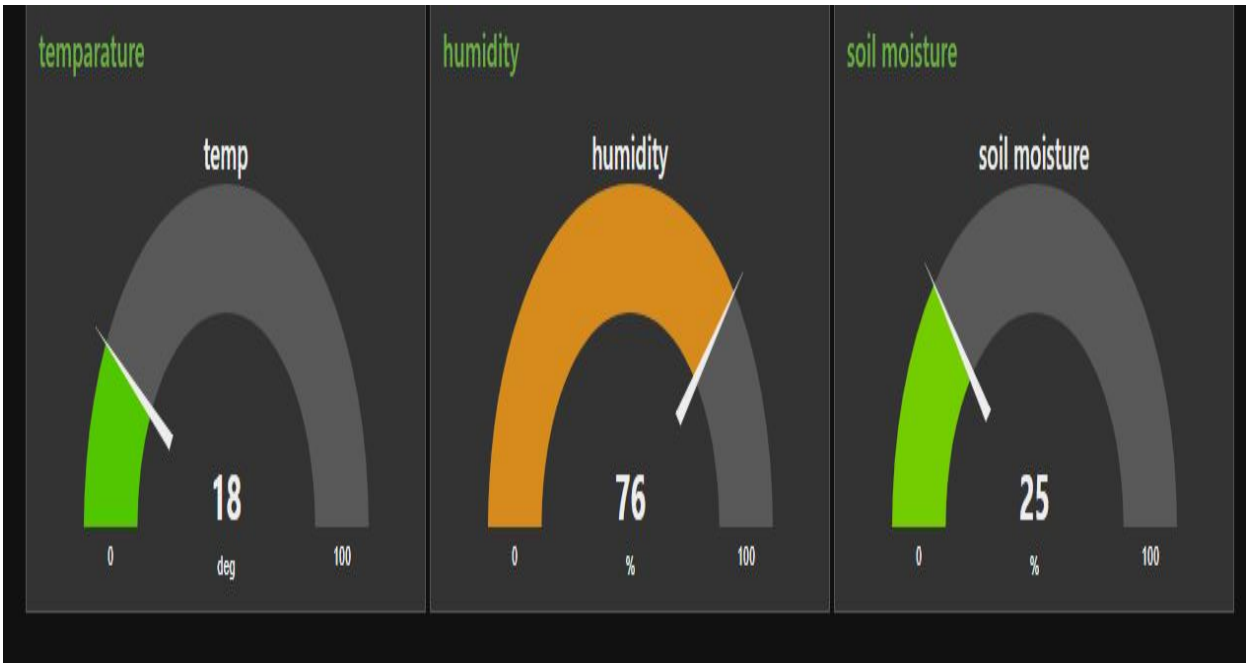
```
# Disconnect the device and application from the cloud
deviceCli.disconnect()
```

5.OUTPUT VIEW:

- This is the dashboard view of local climatic conditions and motor control.



- this is the dashboard view of field conditons.

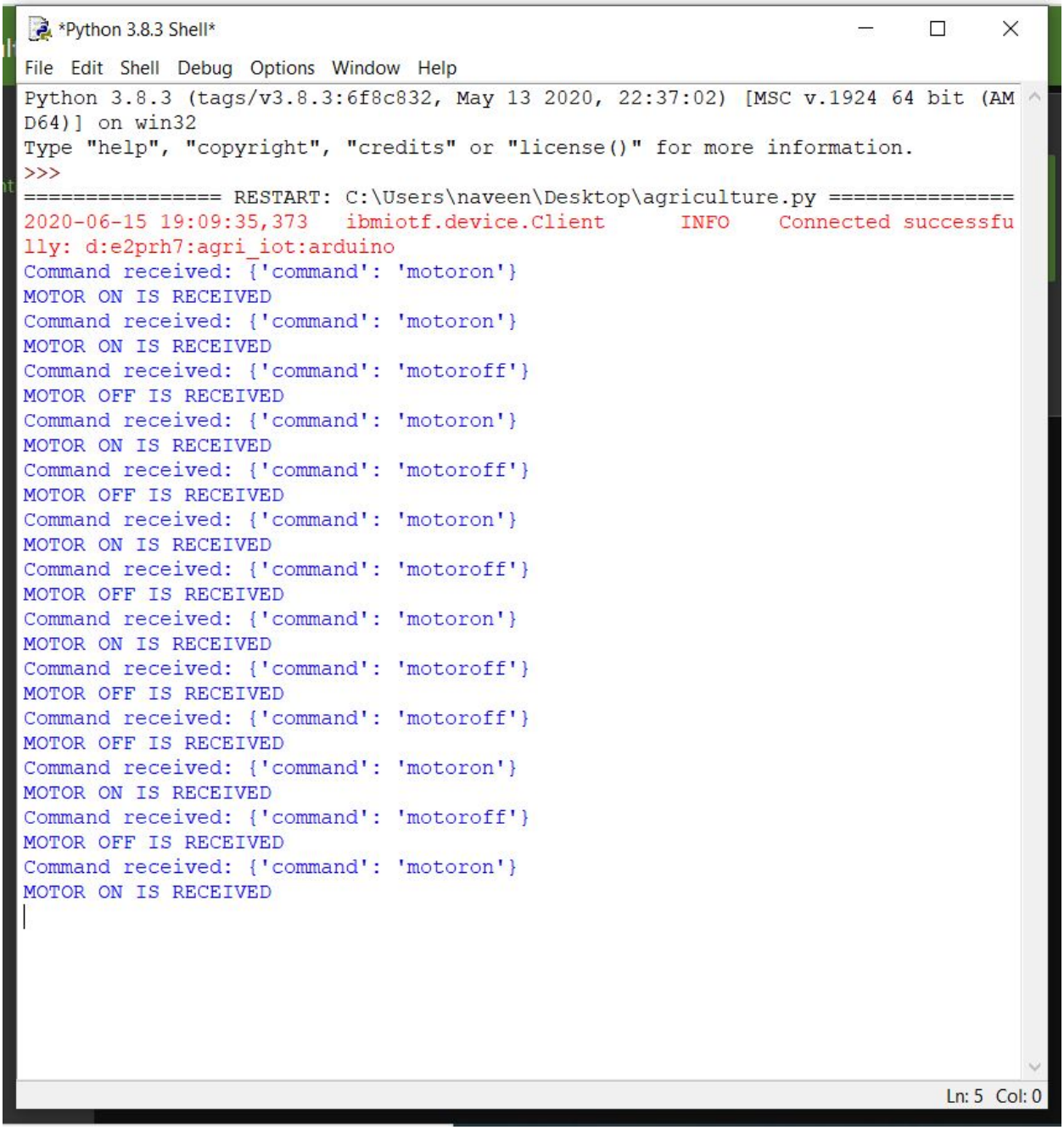


PYTHON CODE OUTPUT:

- It is the output when we run the python code in the shell.

- It shows output as motor on when we click on the button motor on in the motor control dashboard.

- It shows output as motor off when we click on the button motor off in the motor control dashboard.



6 . CONCLUSIONS AND FUTURE SCOPE :

CONCLUSION :

IoT based SMART SYSTEM AGRICULTURE SYSTEM for Live Monitoring of Temperature and Soil Moisture has been done with ibm cloud . The System has high efficiency and

accuracy in fetching the live data of temperature and soil moisture. The IoT based smart farming System being proposed via this report will assist farmers in increasing the agriculture yield and take efficient care of food production as the System will always provide helping hand to farmers for getting accurate live feed of environmental temperature and soil moisture .

FUTURE SCOPE :

Future work would be focused more on increasing sensors on this system to

fetch more data especially with regard to Pest Control and by also integrating GPS module in this system to enhance this Agriculture IoT Technology to full-fledged Agriculture Precision ready product.

7.REFERENCES:

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