GREEN HOUSE MONITORING AND CONTROL SYSTEM

BY:

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INTRODUCTION

1.1. OVERVIEW

The greenhouse industry is the fastest growing sector worldwide. The greenhouse separates the crop from the environment, thus providing some way of shelter from the direct influence of the external weather conditions. This enables the production of crops which otherwise could not be produced at that specific location. The greenhouse enclosure enables the manipulation of the crop environment. This asset allows the farmer to improve the cultivation in a way the plants need. It leads to higher crop yield, prolonged production period, better quality, and less use of protective chemicals.

1.2. PURPOSE

A greenhouse is a structure that is built of walls and a transparent roof and is designed to maintain regulated climatic conditions. These structures are used for the cultivation of plants, fruits, and vegetables which require a particular level of sunlight, temperature, humidity and soil moisture. IOT and Arduino based Greenhouse Environment Monitoring and Controlling Project is designed to maintain these conditions in the greenhouse.By using this project one can monitor the temperature, humidity and the soil moisture details in real time. He/she can also switch on or off the motor and decide the crop to yield using a web application or mobile application.

LITERATURE SURVEY:

EXISTING PROBLEM:

Currently, there are numerous researches on greenhouse automation. These researches differ depending on the components that can be categorized as communication and control infrastructure, embedded system used on greenhouse, sensors and convertors gaining skills to system and user-interface. For infrastructure, several communication protocols such as wired data

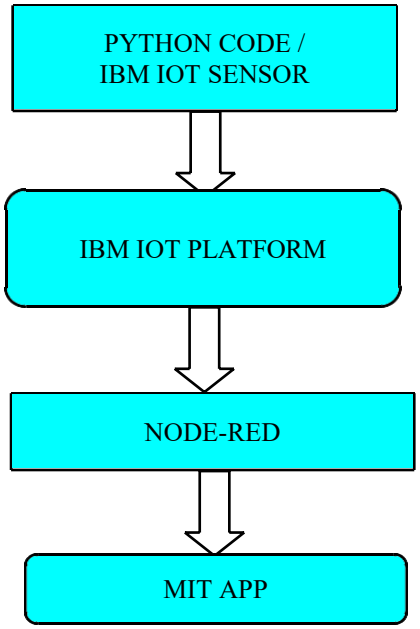
communication-based RS485, Bluetooth , CAN (Controller Area Network) , GPRS (General Packet Radio System), GSM (Global System for Mobile Communications) and Internet which hinge on system installation cost, distance and data transmission rate have been used. Since it communicates to the client with SMS functionality, the data updating will be extreme slow and the user interface are complicated.

PROPOSED SOLUTION :

The solution proposed to solve the problem is an integrated system using IBM IoT Platform where all the devices are connected through IBM Watson and two interfaces one is website and other is a mobile application is created to monitor the current temperature and humidity readings and with the help of the readings soil moisture can be calculated thus Motor can be turned on and off depending on the crop choosen at any time from any place.

THEORITICAL ANALYSIS:

BLOCK DIAGRAM :



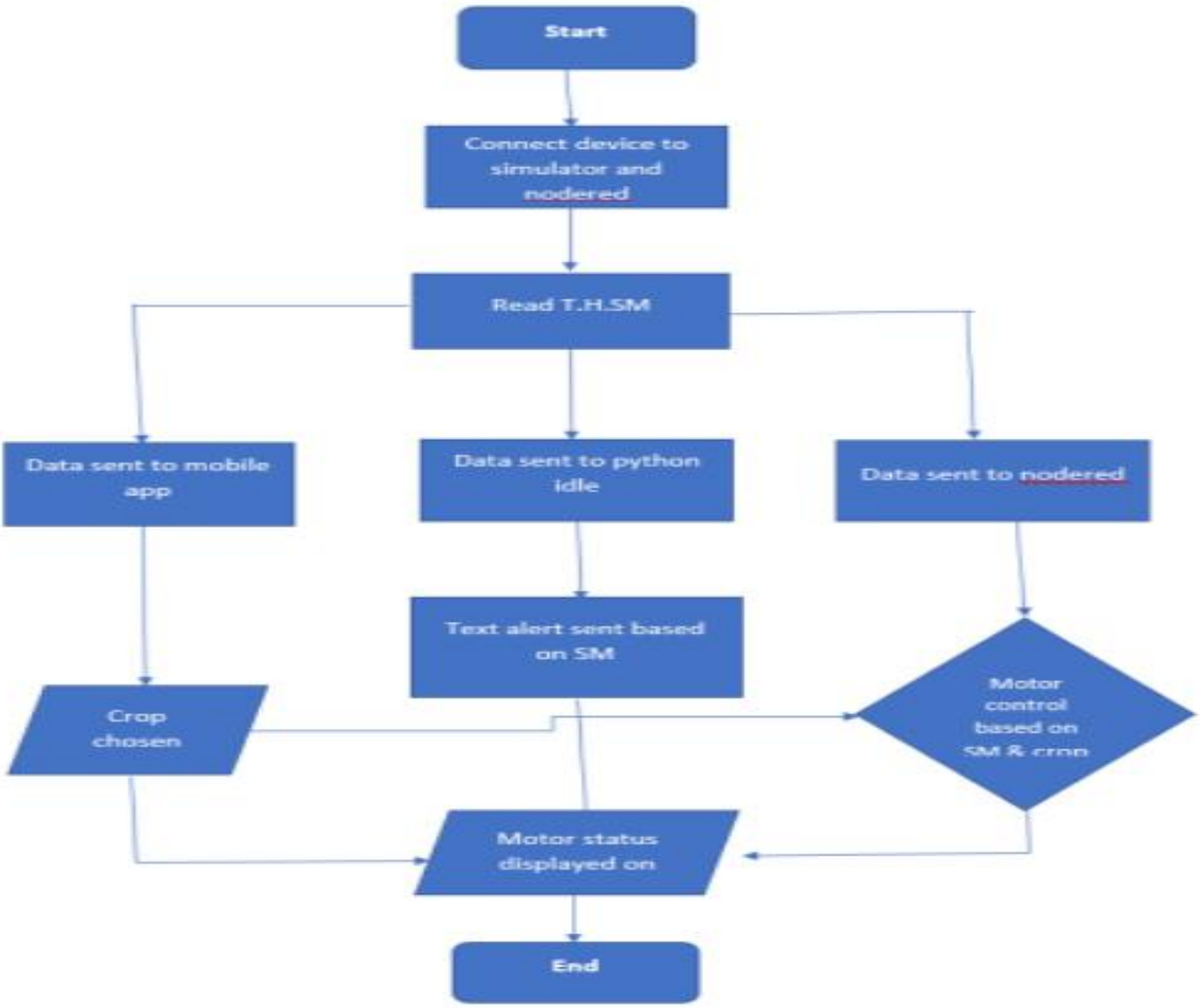
3.2. SOFTWARE DESIGNING :

In the software designing part create a IBM cloud platform. In this design the raspberry pi model is used. the software should be design by taking avalues from the dht11 sensor and then sent to the IBM cloud services and then the data send to the mobile application which was developed using MIT app inventor. Here we use python language for coding, Node-Red ,etc.

EXPERIMENTAL INVESTIGATIONS:

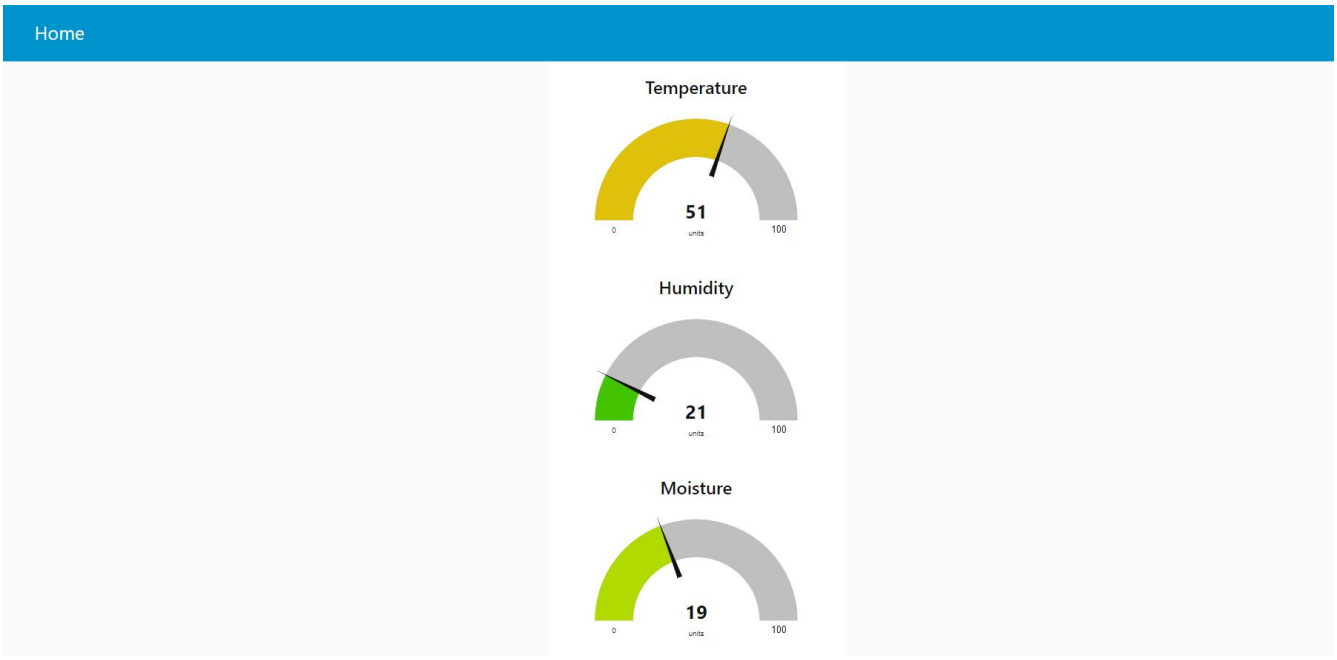
By integrating the applications using Watson IoT all the devices can be connected and thus they can be controlled from any place and at any time. Real time data can be seen from the mobile application and the online web application.Appropriate environmental conditions are necessary for optimum plant growth, improved crop yields, and efficient use of water and other resources. Automating the data acquisition process of the soil conditions and various climatic parameters that govern plant growth allows information to be collected with this system with less labor requirements. This IOT Greenhouse monitoring systems employs PC or phone-based systems for keeping the owner continuously informed of the conditions inside the greenhouse.

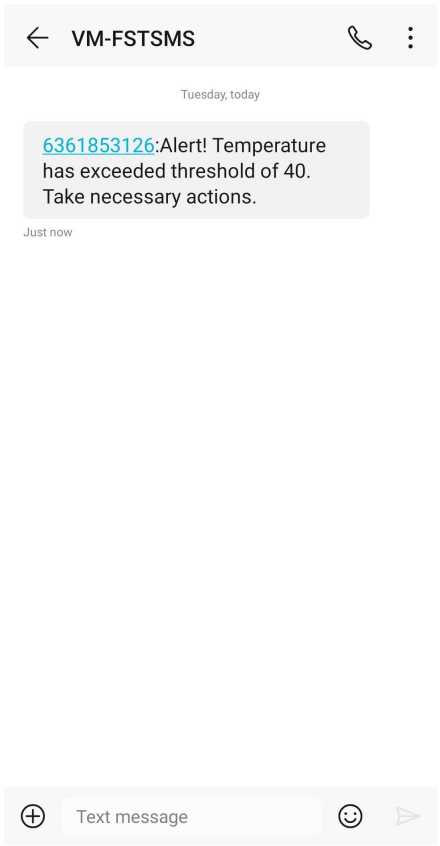
FLOWCHART

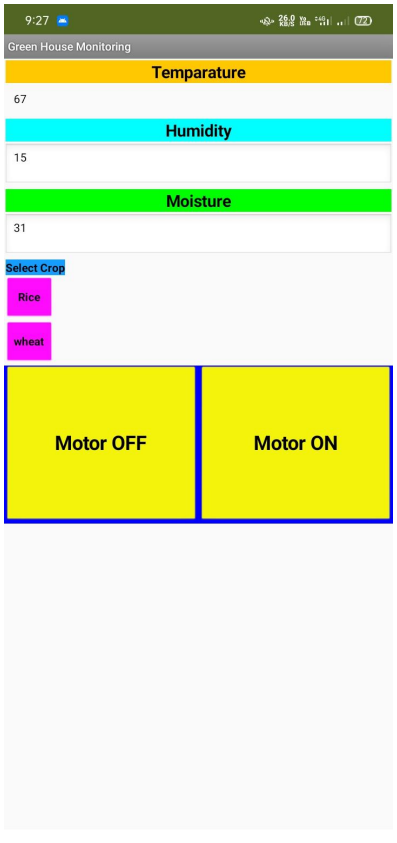

Start
Connect device to simulator and nodered
Read T.H.SM
Data sent to mobile app
Data sent to python idle
Data sent to nodered
Text alert sent based on SM
Crop chosen
Motor control based on SM & crnn
Motor status displayed on
End

RESULT :

One can view the temperature, humidity and soil moisture anywhere and anytime and can control the green house.







ADVANTAGES :

· User friendly
· Easily implementable
· Focuses on main parameters
· Uses GSM because of their availability
· Easy network coverage
· Cloud computing procides Increased storage
· Easier group collaboration
· Resource continuity

DISADVANTAGES :

Requires higher initial capital investment for the distribution system and controls.

APPLICATION :

- Can be used in green houses to control the temperature, soil moisture, humidity and light for the proper growth of plants

- With little modification, this project can be used in Mechanical companies to measure various parameters of operating machines like temperature and light.

- 3. Temperature monitoring and controlling action can be used in home or various halls like conference room, seminar hall to control the temperature of room

CONCLUSION :

This project offers a design of fully automated greenhouse management system. From the experiment it could be seen that it is fulfilling all re-

quirements related greenhouse monitoring. The automatic greenhouse sensor design could help in increasing the productivity of plants. As it has been mentioned earlier, we are not only providing automatic control over the devices like light, motor pump but also we have a mechanism to alert farmers regarding the parameter changes in the greenhouse so that early precaution steps can be taken. Thus this construction, productivity of cropping can be continuously increased so it can handle famine problem around the world.

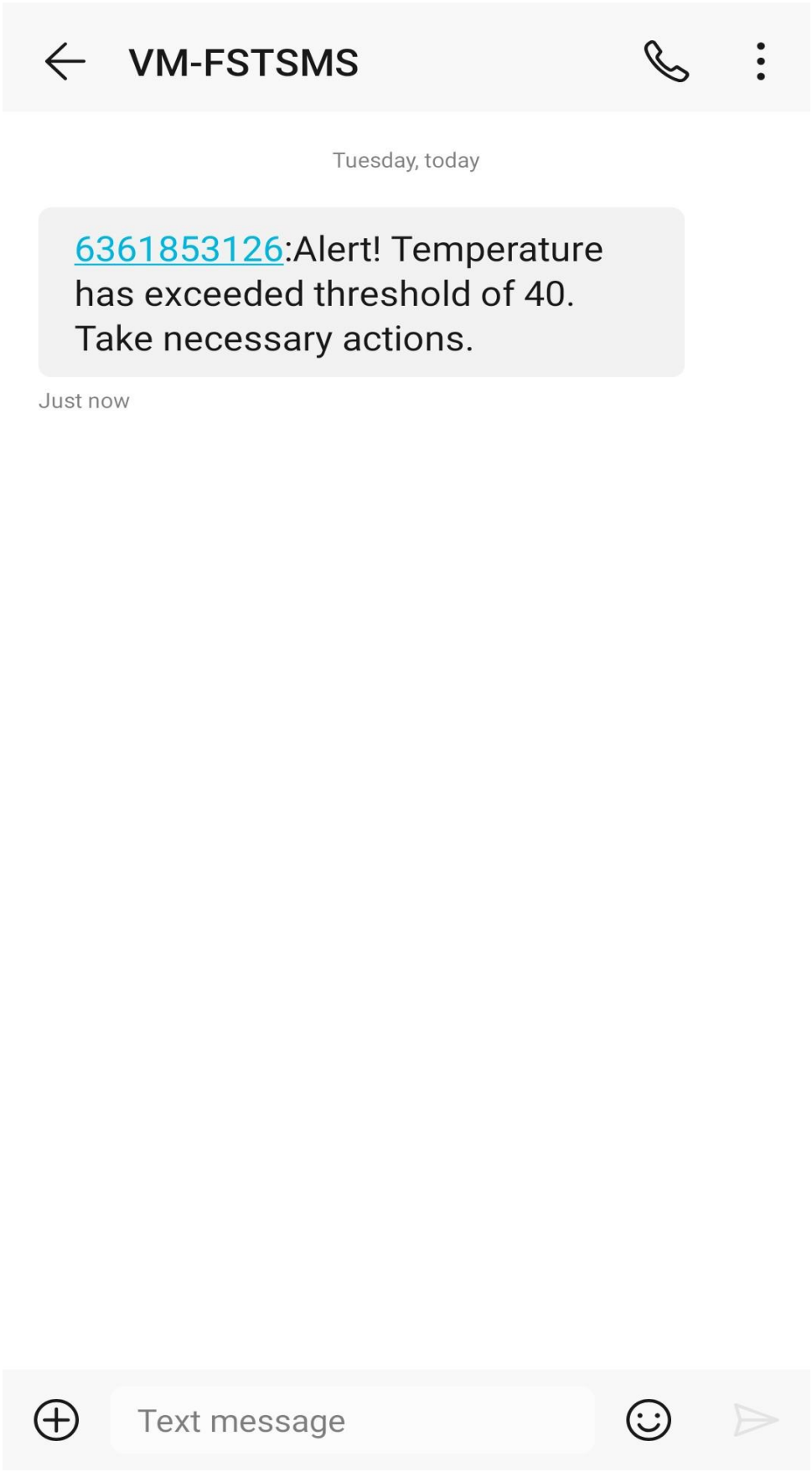
FUTURE SCOPE :

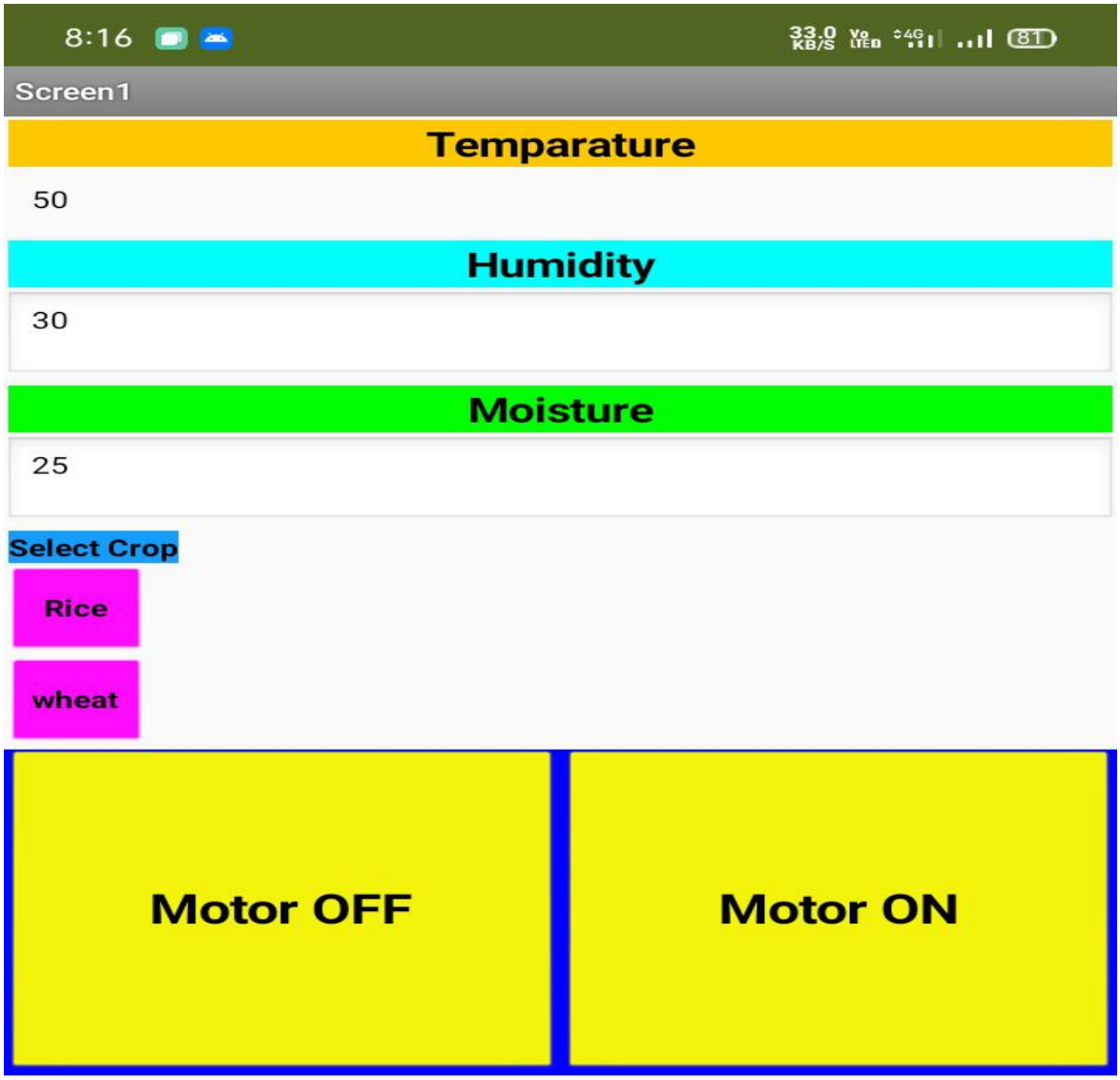
- We can monitor more parameters like PH of soil, pressure, water level and at the same time control them
- We can send this data to a remote location using mobile or internet
- We can draw graphs of variations in these parameters using computer
- This project can be further enhanced to monitor and control the pesticide le vel

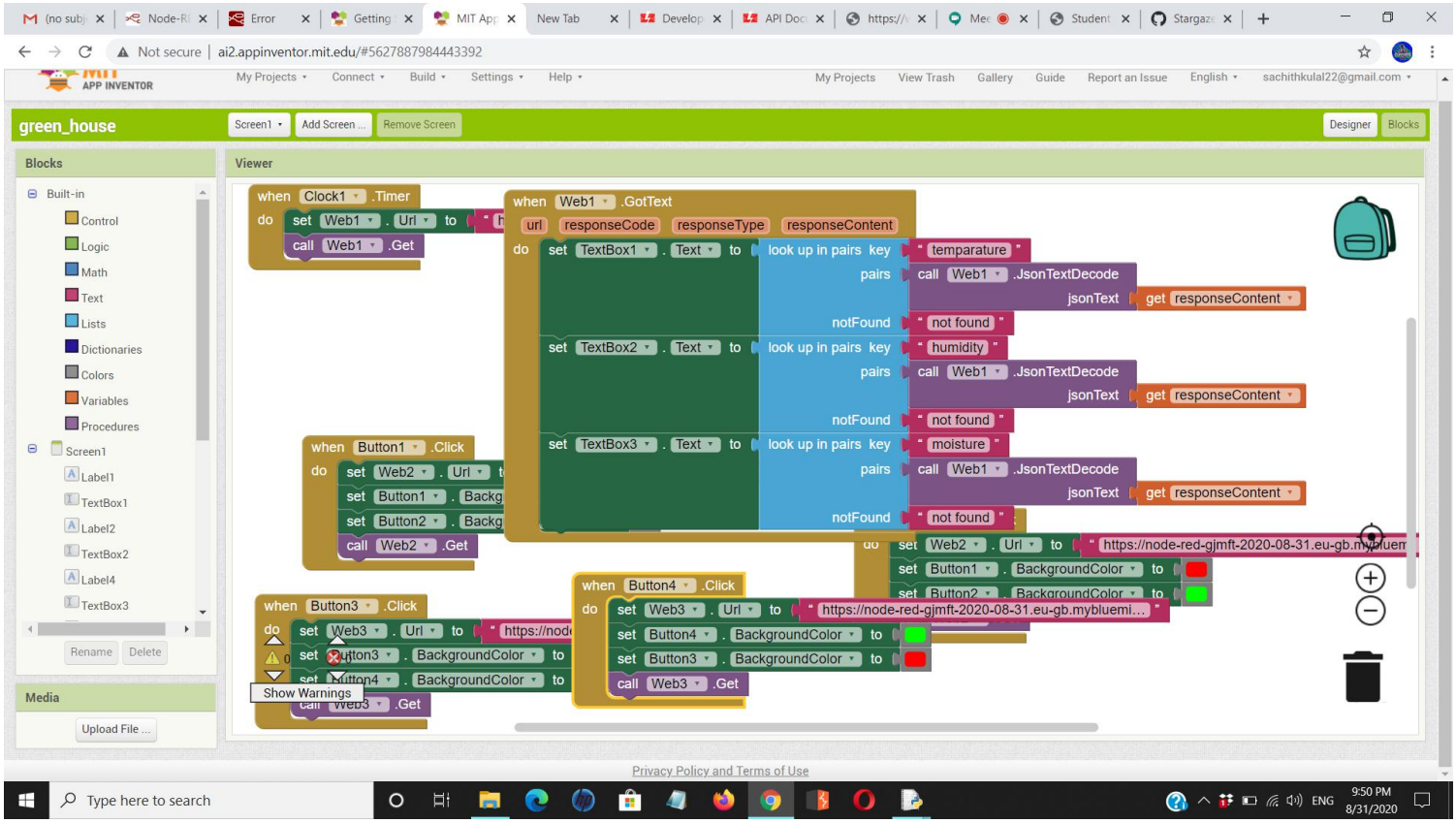
BIBILOGRAPHY:

- **SmartBridge Videos**
- **www.google.com**
- **www.wikipedia.com**

APPENDIX :


VM-FSTSMS
Tuesday, today
6361853126:Alert! Temperature has exceeded threshold of 40. Take necessary actions.
Just now
Text message


8:16
33.0 KB/S
Screen1
Temparature
50
Humidity
30
Moisture
25
Select Crop
Rice
wheat
Motor OFF
Motor ON


green_house
Screen1
Add Screen ...
Remove Screen
Designer
Blocks
Viewer
when Clock1 .Timer
do set Web1 . Url to
call Web1 .Get
when Web1 .GotText
url responseCode responseType responseContent
do set TextBox1 . Text to look up in pairs key " temparature "
pairs call Web1 .JsonTextDecode
jsonText get responseContent
notFound " not found "
set TextBox2 . Text to look up in pairs key " humidity "
set TextBox3 . Text to look up in pairs key " moisture "
when Button1 .Click
set Web2 . Url to
set Button1 . BackgroundColor to
set Button2 . BackgroundColor to
call Web2 .Get
when Button3 .Click
set Web3 . Url to
set Button3 . BackgroundColor to
when Button4 .Click
set Button4 . BackgroundColor to
call Web3 .Get
https://node-red-gjmft-2020-08-31.eu-gb.mybluemi...
Show Warnings
Built-in
Control
Logic
Math
Text
Lists
Dictionaries
Colors
Variables
Procedures
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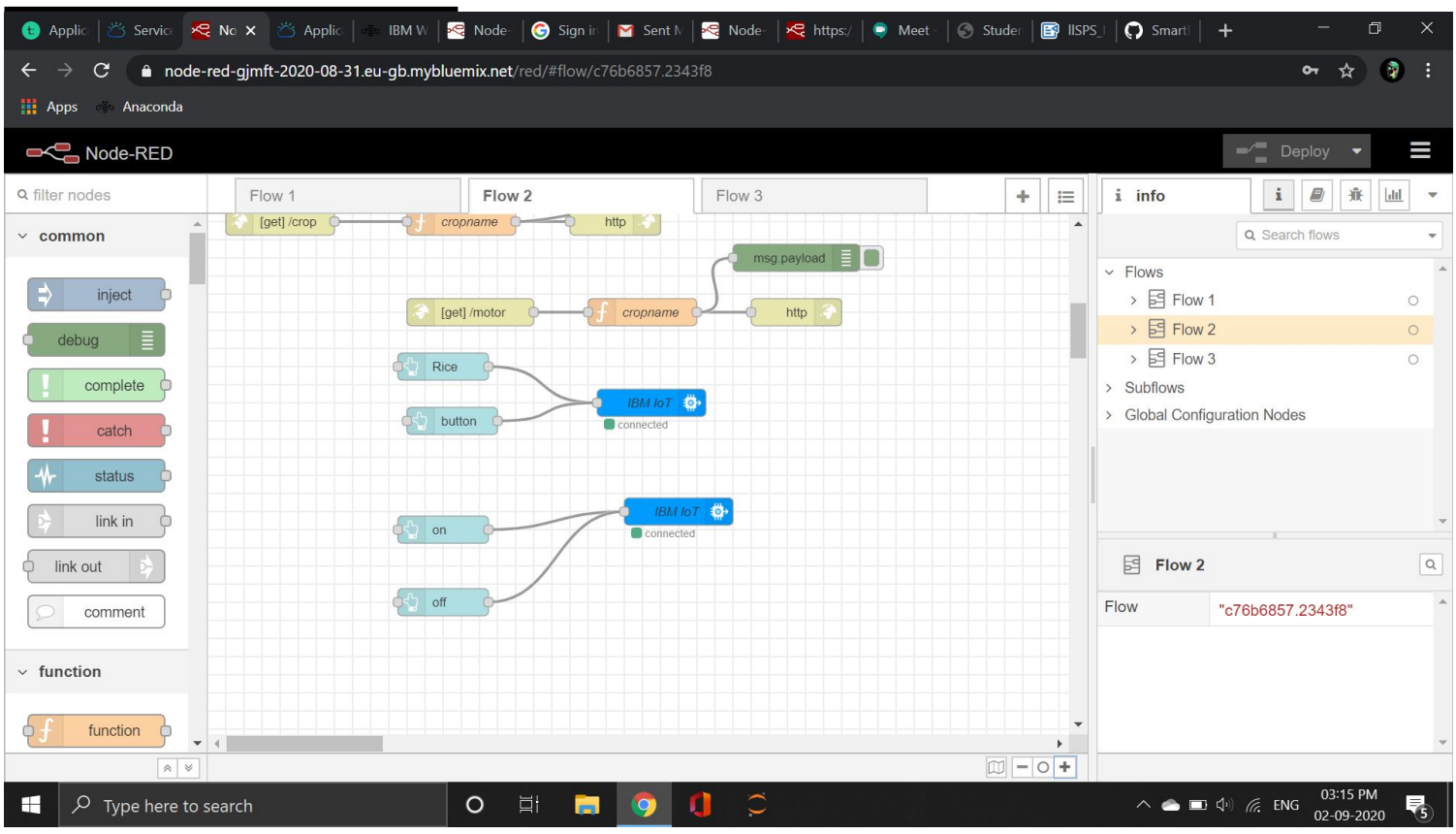
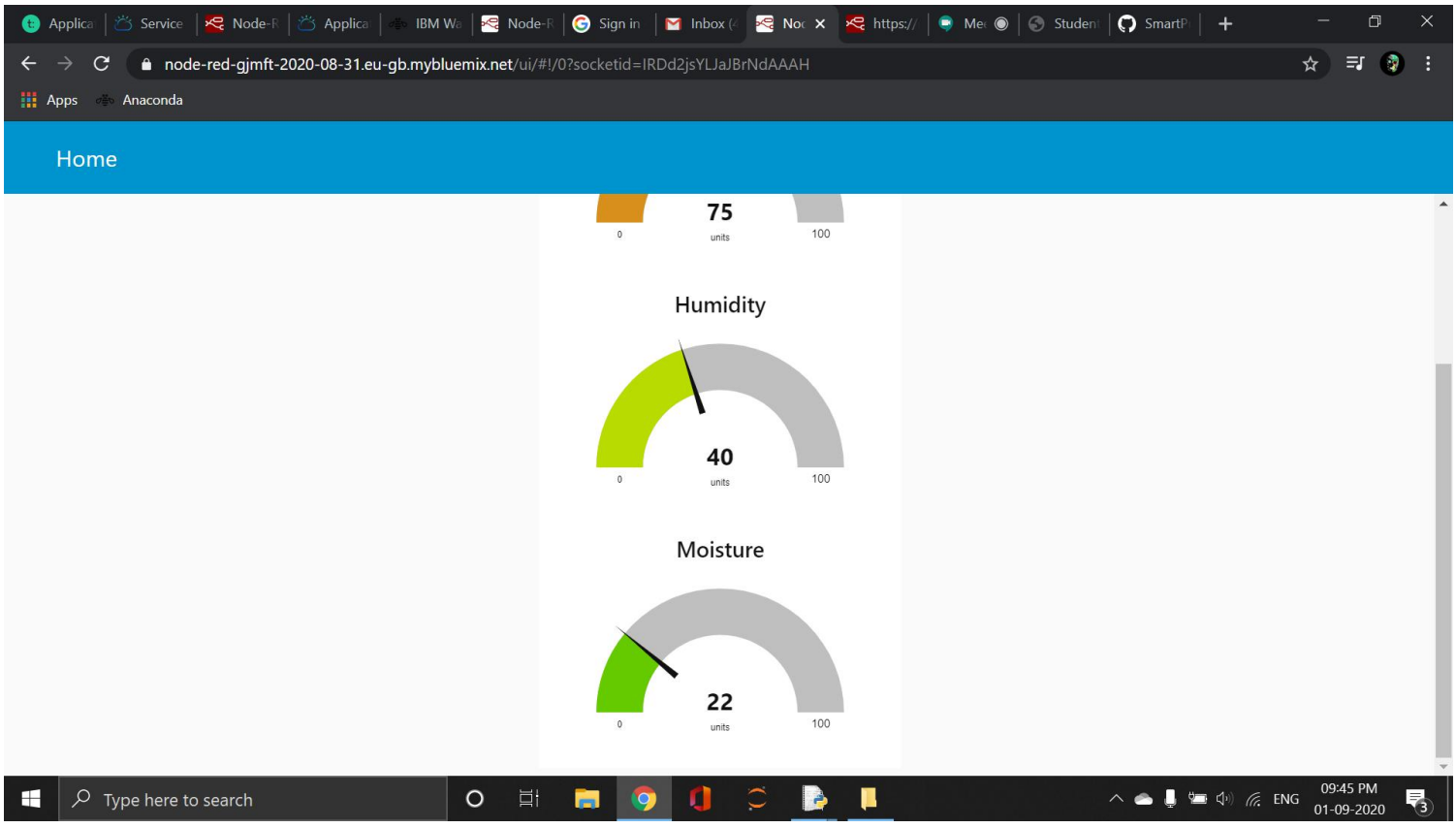
Label1
TextBox1
Label2
TextBox2
Label4
TextBox3
Rename
Delete
Media
Upload File ...
Privacy Policy and Terms of Use


node-red-gjmft-2020-08-31.eu-gb.mybluemix.net/red/#flow/c76b6857.2343f8
Node-RED
Deploy
filter nodes
Flow 1
Flow 2
Flow 3
common
inject
debug
complete
catch
status
link in
link out
comment
function
[get] /crop
cropname
http
msg.payload
[get] /motor
Rice
button
IBM IoT
connected
on
off
info
Search flows
Flows
Subflows
Global Configuration Nodes
Flow
"c76b6857.2343f8"


node-red-gjmft-2020-08-31.eu-gb.mybluemix.net/ui/#!/0?socketid=IRDd2jsYLJaJBrNdAAAH
Apps
Anaconda
Home
75
0
units
100
Humidity
40
0
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100
Moisture
22
0
units
100
Type here to search
ENG
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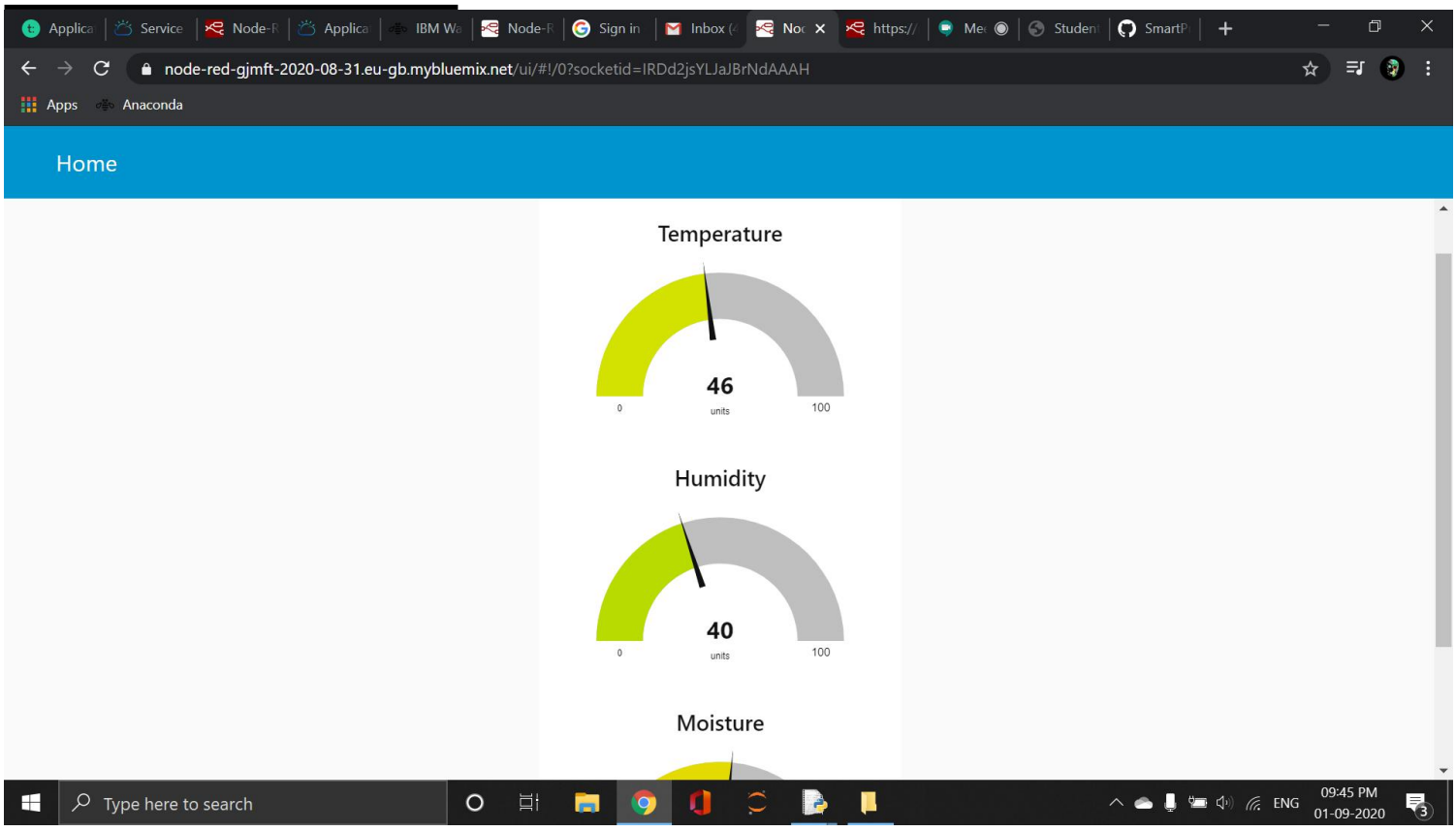
01-09-2020


node-red-gjmft-2020-08-31.eu-gb.mybluemix.net/ui/#!/0?socketid=IRDd2jsYLJaJBrNdAAAH
Apps
Anaconda
Home
Temperature
46
0
units
100
Humidity
40
0
units
100
Moisture
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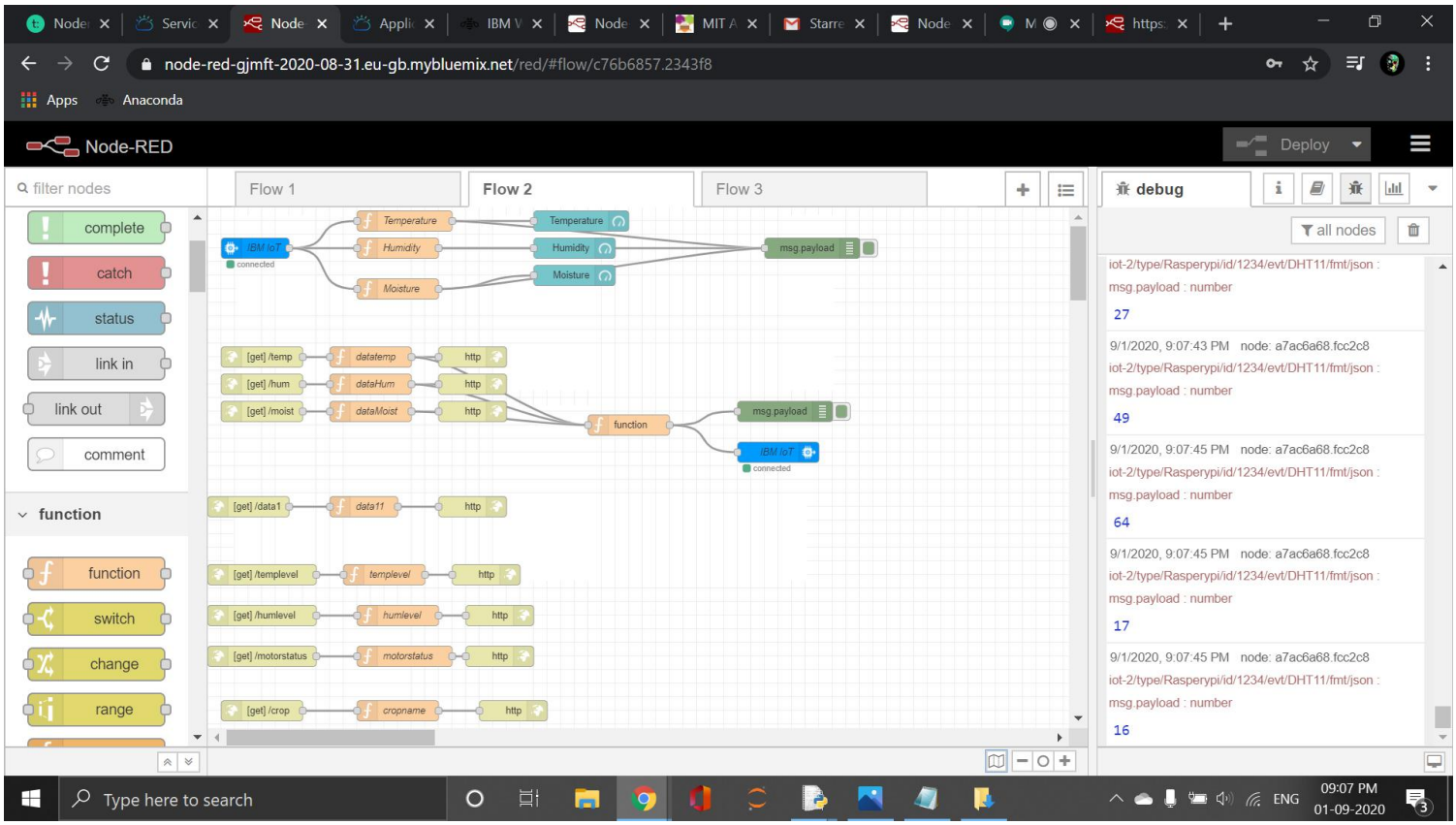
01-09-2020


node-red-gjmft-2020-08-31.eu-gb.mybluemix.net/red/#flow/c76b6857.2343f8
Node-RED
Deploy
filter nodes
Flow 1
Flow 2
Flow 3
debug
all nodes
complete
catch
status
link in
link out
comment
function
function
switch
change
range
Temperature
Humidity
Moisture
IBM IoT
connected
msg.payload
[get] /temp
[get] /hum
[get] /moist
datatemp
dataHum
dataMoist
http
function
[get] /data1
data11
[get] /templevel
templevel
[get] /humlevel
humlevel
[get] /motorstatus
motorstatus
[get] /crop
cropname
iot-2/type/Rasperypi/id/1234/evt/DHT11/fmt/json : msg.payload : number
27
9/1/2020, 9:07:43 PM node: a7ac6a68.fcc2c8
49
9/1/2020, 9:07:45 PM node: a7ac6a68.fcc2c8
64
9/1/2020, 9:07:45 PM node: a7ac6a68.fcc2c8
17
9/1/2020, 9:07:45 PM node: a7ac6a68.fcc2c8
16
Type here to search
ENG
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01-09-2020