**Green House Monitoring & Control System**

*by*

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*on*

# Internet of Things

By influence of Smartbridge

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# INTRODUCTION

#### 1 Overview

The objective of this report is to propose IoT based Green House

Monitoring And Control System which aids the farmer in controlling the motors in his Green House remotely by checking the weather as well as soil conditions of the ﬁeld through a Web App And Mobile App.

A Green house is a structure that is built on 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

parameter. Plants needs sustainable climatic conditions to grow and yield a good crop.Green house monitoring allows the farmer to know the temperature,humidity and soil moisture content.

#### 2 PURPOSE

The Project entitled Green house monitoring and control system is an on-line information system with HTTP web based server designed using python, Ibm cloud,Node-Red,Mit Inventor App and aimed at providing a common server for many users connected across the internet

Online interactive system provides an interactive desktop application to user to check the humidity, temperature and requried conditions to grow plants in a sustained climate conditions and yield a good crop.It also provides a web app to check the details of temperature,humidity and gives an option to on and off the motor depending on the requirements.

#### SCOPE

Smart Agriculture System based on IoT can monitor soil moisture and climatic conditions to grow and yield a good crop.

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.

#### 1.Literature survey

•The system does not have information about regular changes on temperature and humidity.

•The system does not have the option to turn motor on and off automatically based on soil moistures.

•The system does not send any alert messages to user regarding high temperature or low temperatue.

•High humidity can cause crop transpiration.

#### 2.Proposed solution

•User can know the temperature and humidity values using a web application or moblie appliction.

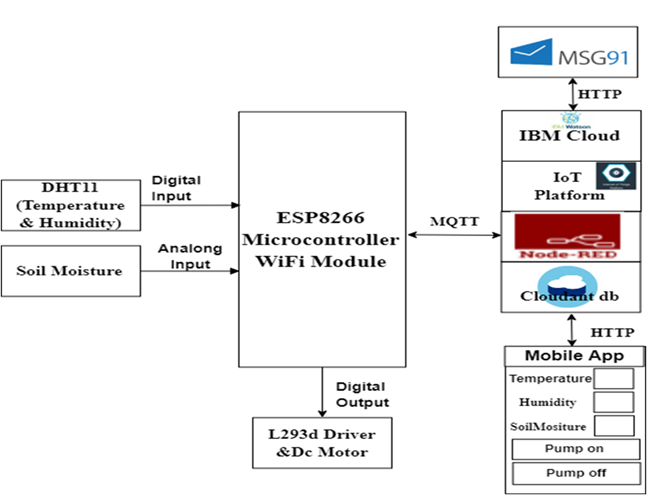
•user can on and off the motor on moblie app or web application deponding on situation.

•If any parameters reach beyond the threshold values user is notiﬁed with alert message.

# THEARITICAL ANALYSIS

#### 1.BLOCK DIAGRAM

Below is the block diagram of the project.



#### 2.HARDWARE DESIGN

*Hardware speciﬁcation:*

* processor : AMD Ryzen 5 2500U with radeon VegaMobile Gfx 2.00GHz

•8 GB RAM

•64 Bit Operating System

*Software Speciﬁcation:*

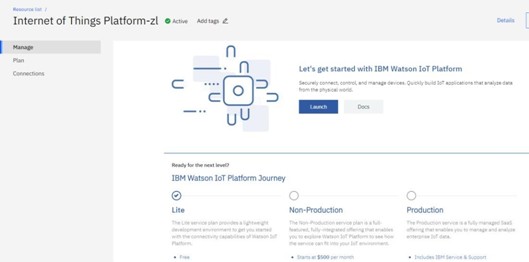
•DataBase : node-red-qcmio-cloudant-1594306440289-79244(cloudant-db)

•python,node-red,Mit-App inventor

#### Designing Procedure

**1.**Sign-in to your IBM cloud account from the linkh [ttps://cloud.ibm.com/login](https://cloud.ibm.com/login). There, go to Catalog and search for IoT in the search bar. Then select Internet of Things platform and subscribe for the desired plan and click create. Now, in the menu, go to Resource

List click on Services then on Internet of Things Platform and then click Launch, as shownbelow:



2 .Now in the Watson IoT platform,click on the Add Device button at the top right corner, as shown below.

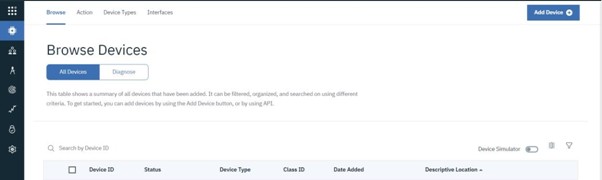
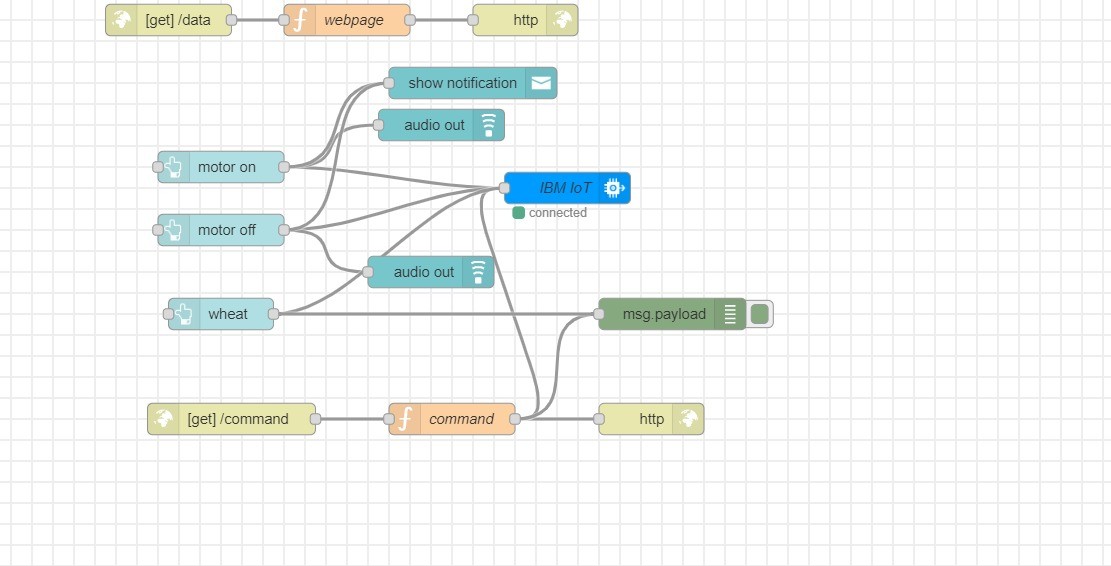
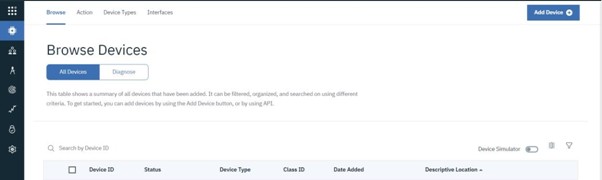


3. Now, once the data is received by the cloud,we use a special tool called Node-Red alow-code programming tool for event-driven applications, to build a Web-App. To install Node-Red on windows

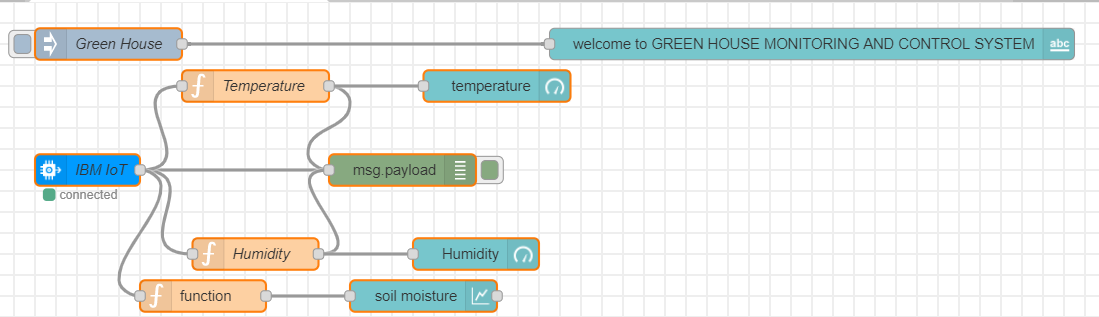
**N ODE RED FLOWS**

**Flows :-**

**ﬁ g 1:**This ﬂow is used to give the information about motor on/off conditions

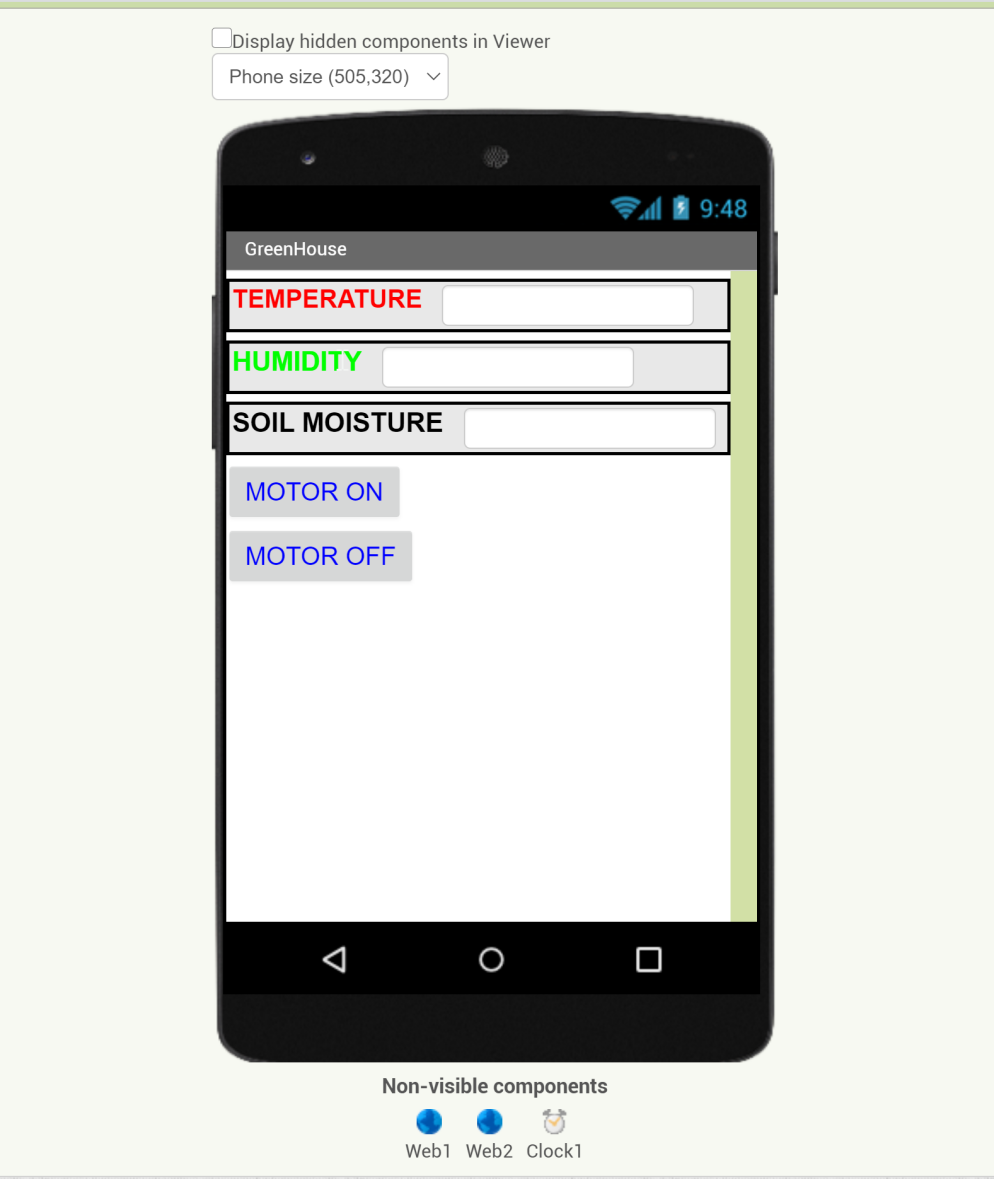
.**ﬁg 2:**This ﬂow is used to give the information about temperature and humidity ,soil moisture.

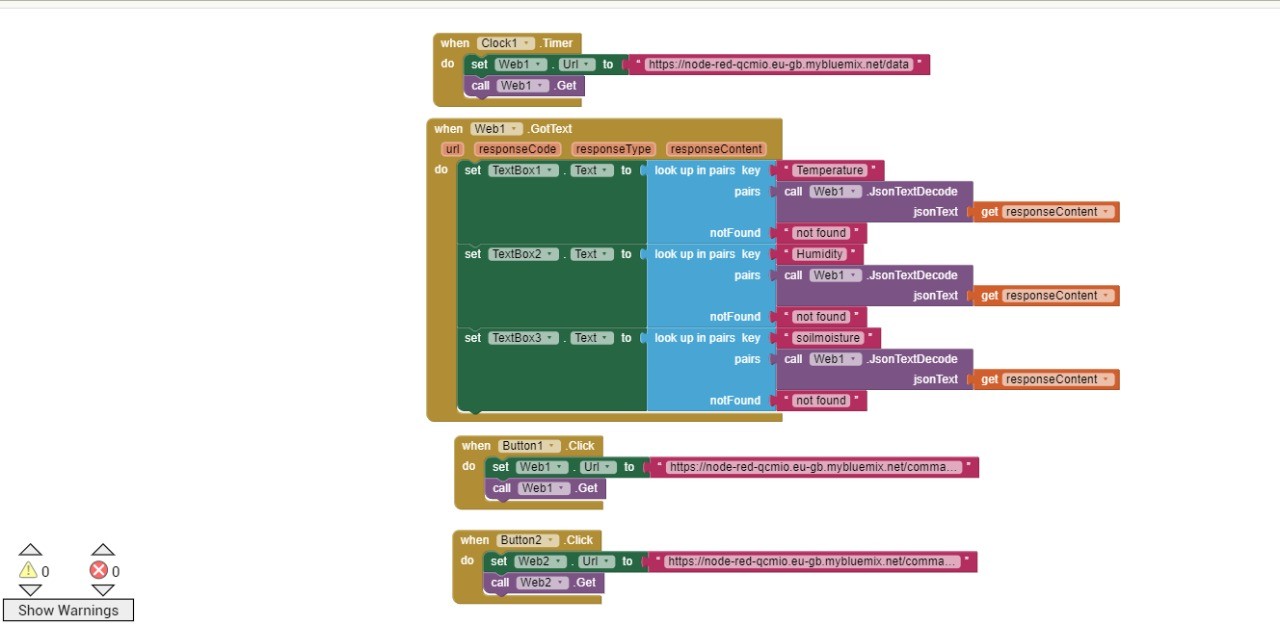
### *ﬁgure-1*



***FIGURE-2***

**M IT\_APP INVENTOR:**

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⁕This is the backend application of the mobile app.

### *PYTHON CODE to retrieve commands from IBM Watson IOT* Platform:

import time import sys

import ibmiotf.application import ibmiotf.device import random

import requests

#Provide your IBM Watson Device Credentials

organization =”2ega04”

deviceType = “Adhyan”

deviceId = “1234”

authMethod = “token” authToken = “12345678”

def myCommandCallback(cmd):

print("Command received: %s" % cmd.data)#Commands print(type(cmd.data))

i=cmd.data['command'] if i=='motoron':

print("motor is on") elif i=='motoroff':

print("motor is off")

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:

hum=random.randint(10, 40) #print(hum)

temp =random.randint(30, 80) soil=random.randint(10,60)

#Send Temperature & Humidity to IBM Watson

data = { 'Temperature' : temp, 'Humidity': hum, 'soilmoisture':soil } #print (data)

def myOnPublishCallback():

print ("Published Temperature = %s C" % temp, "Humidity = %s %%" % hum,"soilmoisture= %s %"%soil, "to IBM Watson")

success = deviceCli.publishEvent("Weather", "json", data, qos=0, on\_publish=myOnPublishCallback)

if not success:

print("Not connected to IoTF") time.sleep(2)

deviceCli.commandCallback = myCommandCallback

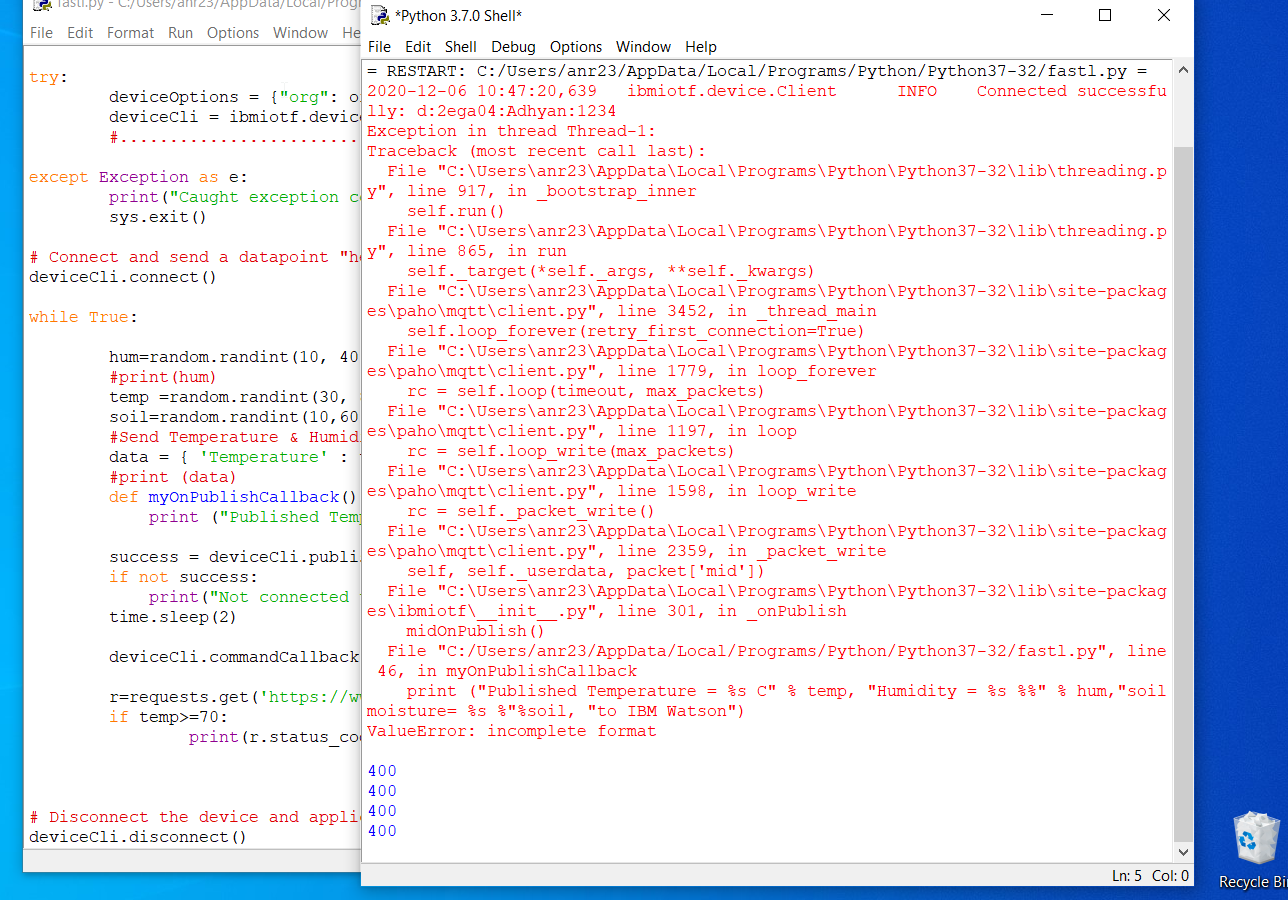
r=requests.get('https://www.fast2sms.com/dev/bulk?authorization=tXZE8BJRjI1ho3GWLgr0N9FS7MUkwx6ycHnd2DYlbTzPmpVfQAr3AT52w0xLpeYk1JZGbR76NmBWjvXd&sender\_id=FSTSMS&message=temp is above threshold values&language=english&route=p&numbers=9959389885')

if temp>=70:

print(r.status\_code)

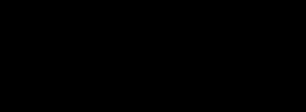
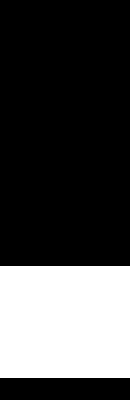
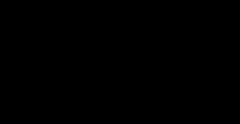
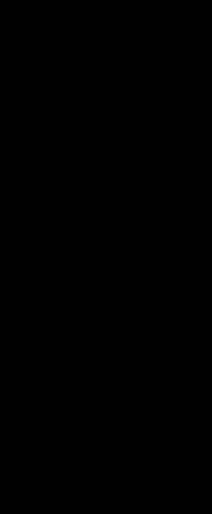
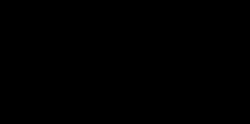
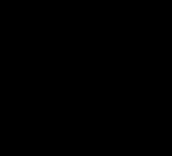
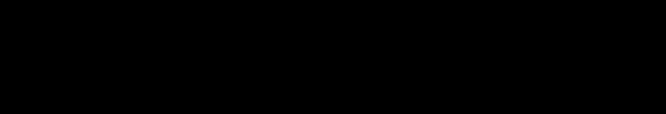
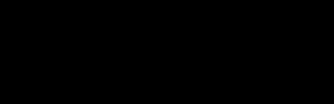
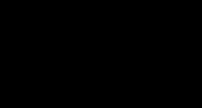
# Disconnect the device and application from the cloud deviceCli.disconnect()

### *Output of the python code :*



1. **FLOWCHART:**

here is the ﬂow chart describing the working of IOT based **Green House Monitoring & Control System.**



START

CONNECT TO

NETWORK

Get temparature, humidty , soil moisture

values from python code

Send data to

WEB APP

Send data to

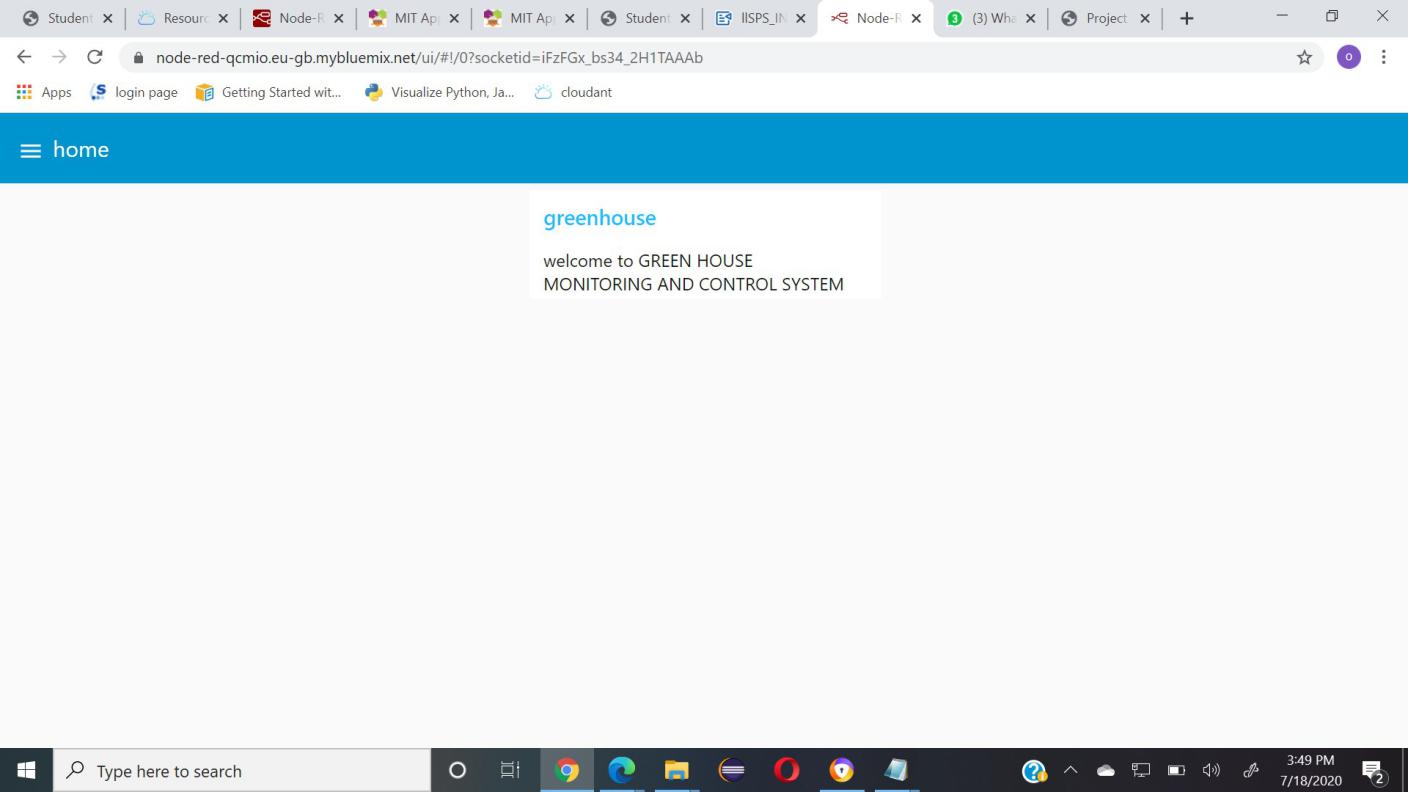
MOBILE APP

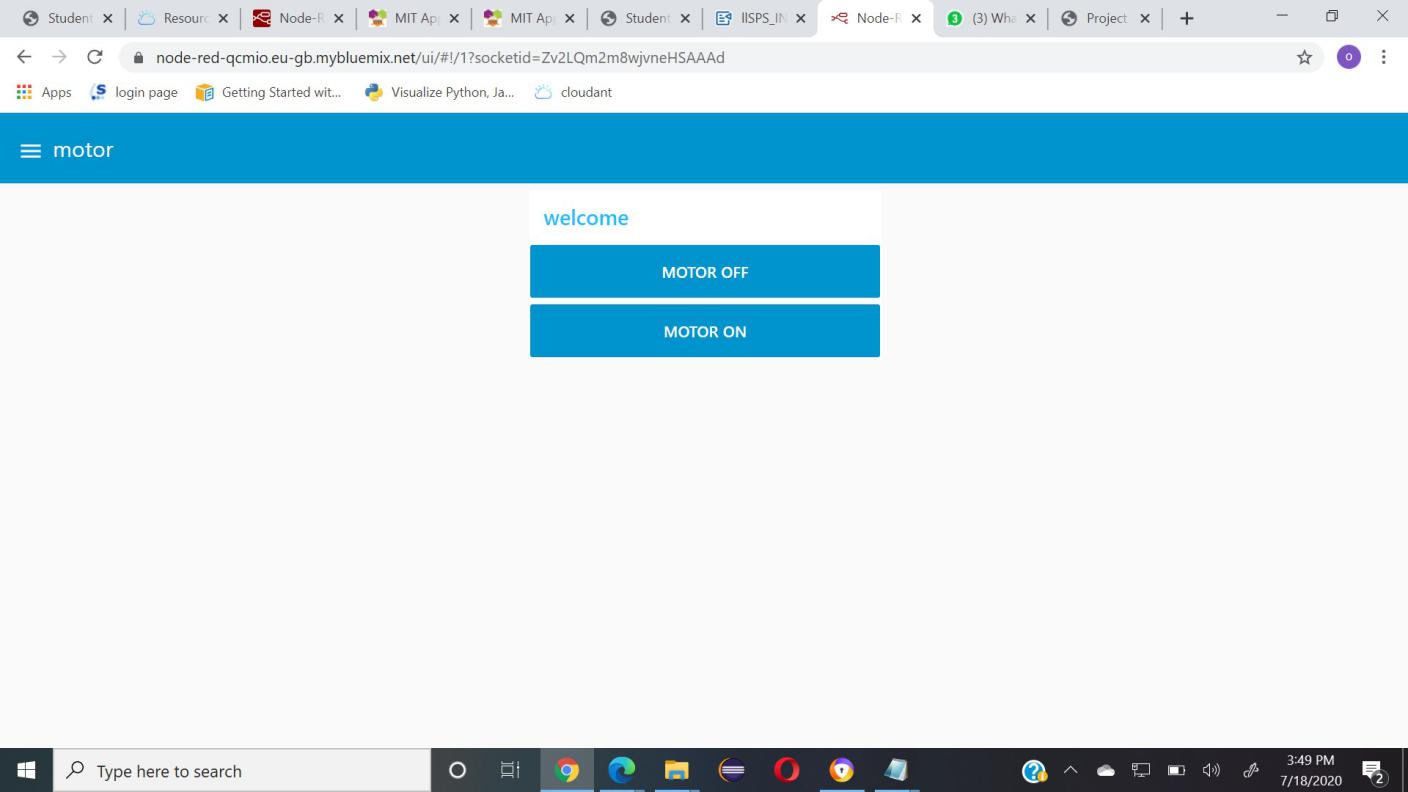
Time Delay

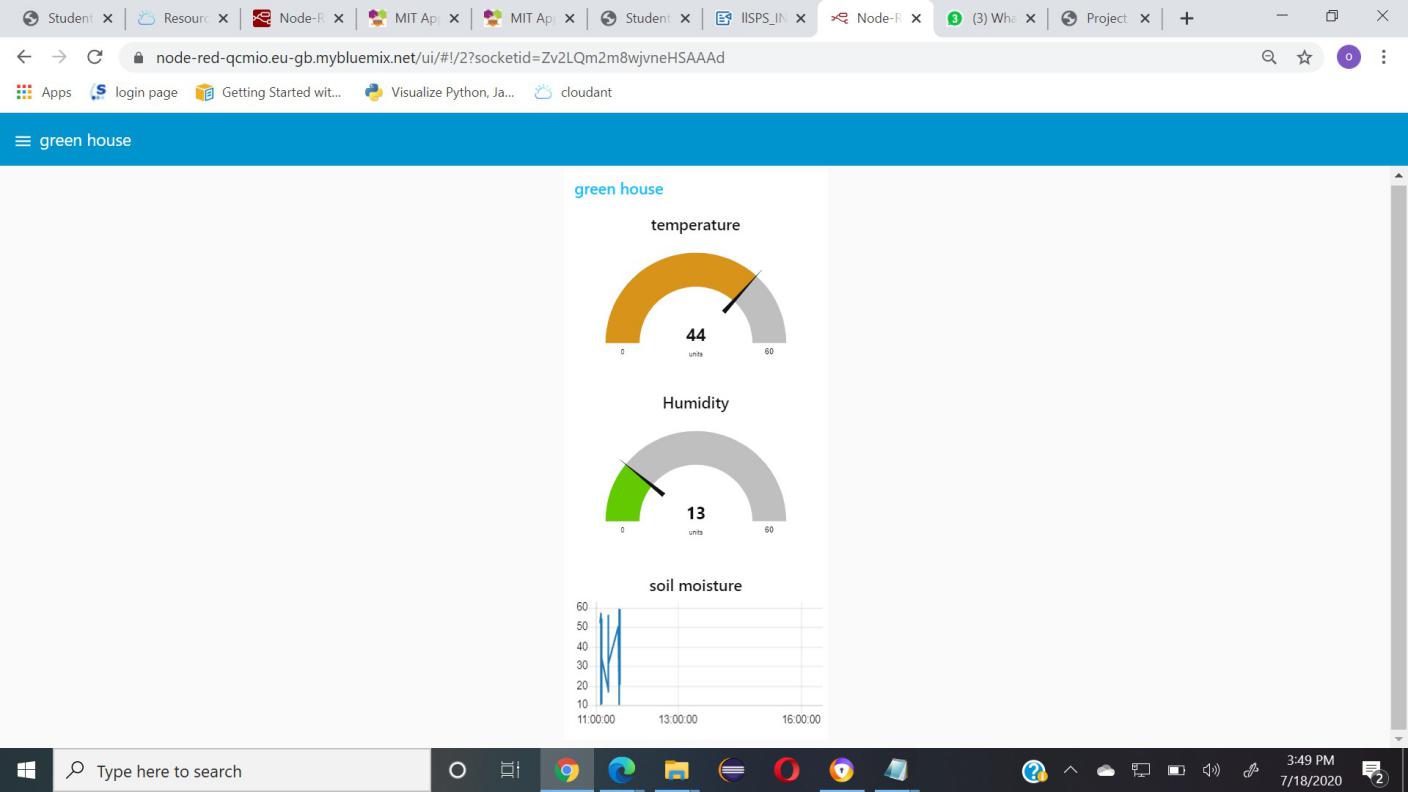
# RESULT:-

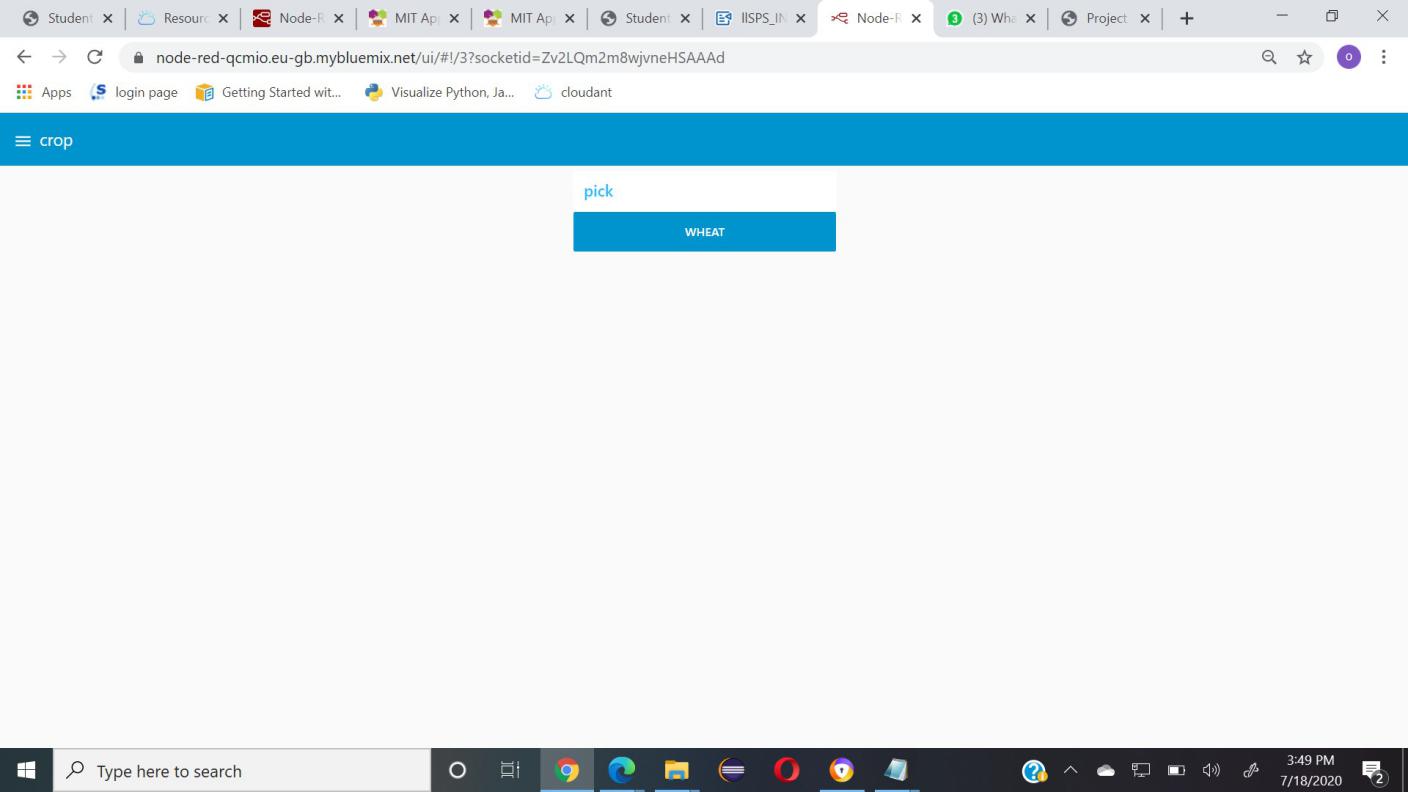
Following the above designing procedure results in a web Applicafion that is used by the farmers to perform green house monitoring and control system in a smart way.

The web Applicafion generated by the above designing procedure is as follows:



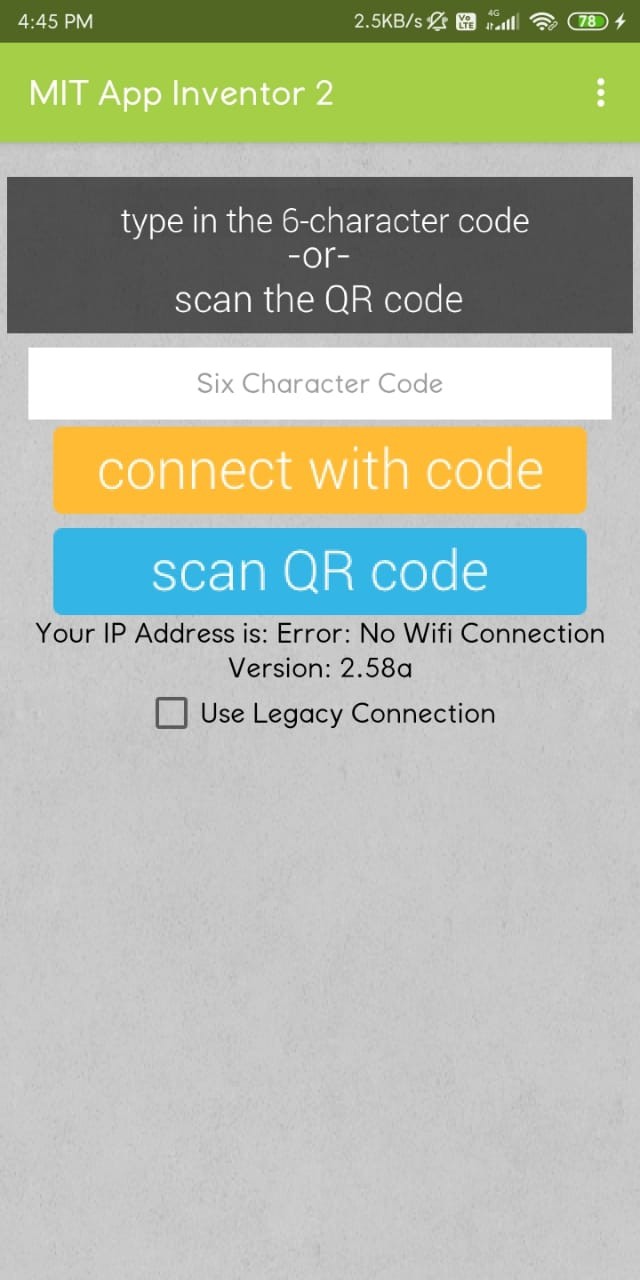


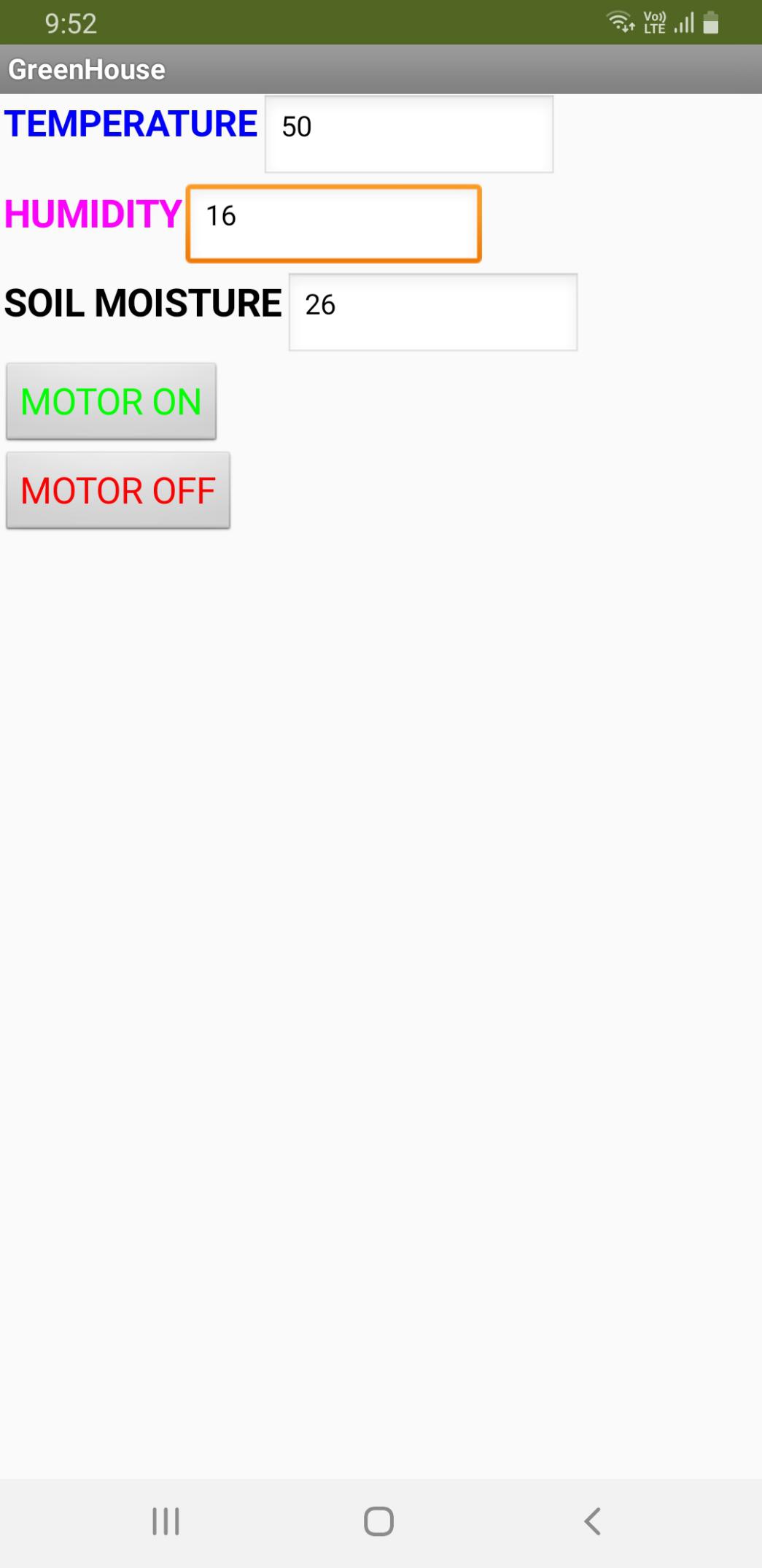




Following the above designing procedure results in a Mobile Applicafion that is used by the farmers to perform green house monitoring and control system in a smart way.

The Mobile Applicafion generated by the above designing procedure is as follows:





# Advantages & Disadvantages:

### *Advantages:*

* High proﬁts
* Clean crops
* Soil-free
* Crops can grow in poor areas
* Less staﬀ
* Shorter harvest fime
* No ploughing

***D isadvantages:***

* Expensive
* Lots of planning needed
* Alarms needed
* Income and ability to grow crops need to be balanced against the cost of the system

1. **Applications:**

* Automafic plant monitoring
* Water pump control
* Climate control
* Intelligent Environment Control System

**9.Conclusion:**

IoT based **Green House Monitoring & Control System** for Live Monitoring of Temperature and Soil Moisture has been proposed using IoT sensor simulator and

Cloud Computing. The IoT based Green House Monitoring & Control 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.

# Bibilography:

# https://smartbridge.teachable.com