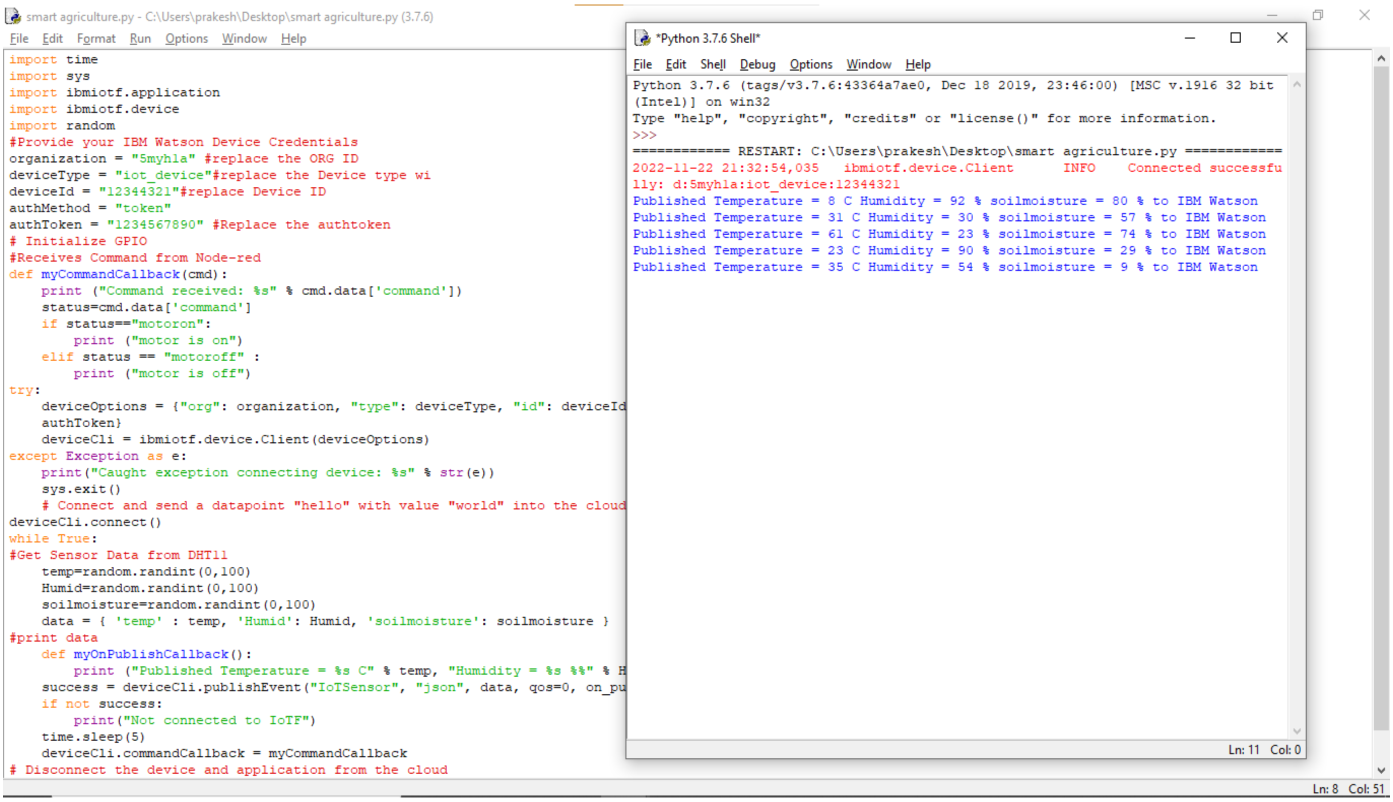
SPRINT DELIVERY – 4

Team ID	PNT2022TMID41919
Project Name	SmartFarmer - IoT Enabled Smart Farming Application
Date	10 November 2022

Receiving commands from IBM cloud using Python program:

```
import time
import sys
import ibmiotf.application
import ibmiotf.device
import random
#Provide your IBM Watson Device Credentials
organization = "5myh1a" #replace the ORG ID
deviceType = "iot_device"#replace the Device type wi
deviceId = "12344321"#replace Device ID
authMethod = "token"
authToken = "1234567890" #Replace the authtoken
# Initialize GPIO
#Receives Command from Node-red
def myCommandCallback(cmd):
    print ("Command received: %s" % cmd.data['command'])
    status=cmd.data['command']
    if status=="motoron":
        print ("motor is on")
    elif status == "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:
```

```
#Get Sensor Data from DHT11
    temp=random.randint(0,100)
    Humid=random.randint(0,100)
    soilmoisture=random.randint(0,100)
    data = { 'temp' : temp, 'Humid': Humid, 'soilmoisture': soilmoisture }
#print data
    def myOnPublishCallback():
        print ("Published Temperature = %s C" % temp, "Humidity = %s %%" % Humid,
"soilmoisture = %s %%"%soilmoisture, "to IBM Watson")
    success = deviceCli.publishEvent("IoTSensor", "json", data, qos=0,
on_publish=myOnPublishCallback)
    if not success:
        print("Not connected to IoTF")
    time.sleep(5)
    deviceCli.commandCallback = myCommandCallback
# Disconnect the device and application from the cloud
deviceCli.disconnect()
```


smart agriculture.py - C:\Users\prakesh\Desktop\smart agriculture.py (3.7.6)
File Edit Format Run Options Window Help
Python 3.7.6 Shell
File Edit Shell Debug Options Window Help
Ln: 11 Col: 0
Ln: 8 Col: 51

```
import time
import sys
import ibmiotf.application
import ibmiotf.device
import random
#Provide your IBM Watson Device Credentials
organization = "5myhla" #replace the ORG ID
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deviceId = "12344321"#replace Device ID
authMethod = "token"
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# Initialize GPIO
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except Exception as e:
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deviceCli.connect()
while True:
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#print data
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    deviceCli.commandCallback = myCommandCallback
# Disconnect the device and application from the cloud
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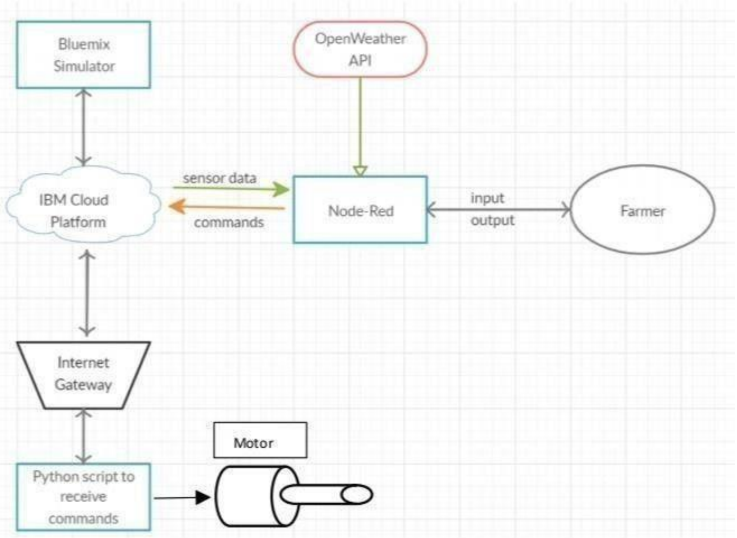
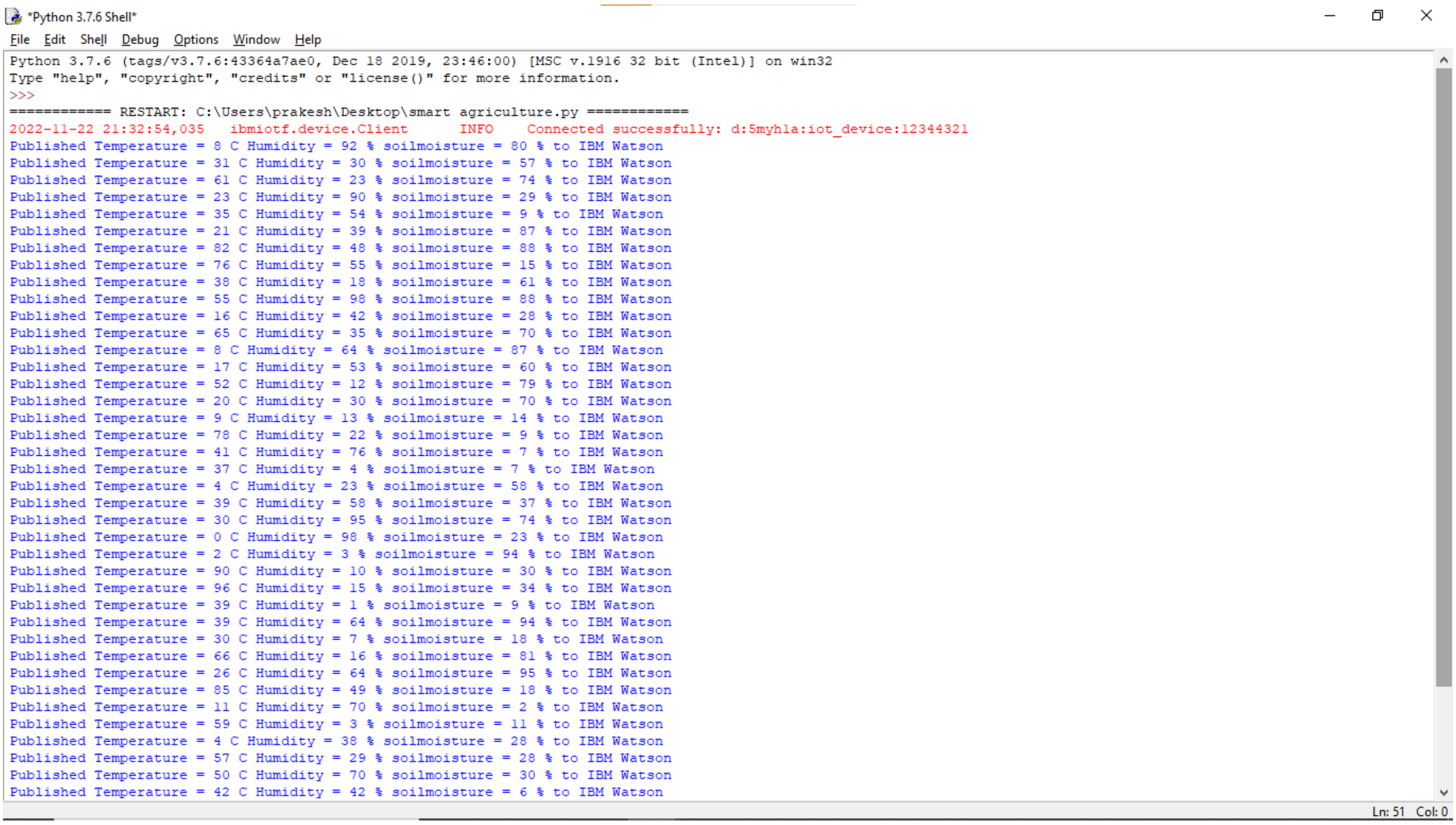
```
Python 3.7.6 (tags/v3.7.6:43364a7ae0, Dec 18 2019, 23:46:00) [MSC v.1916 32 bit
(Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
============ RESTART: C:\Users\prakesh\Desktop\smart agriculture.py ============
2022-11-22 21:32:54,035   ibmiotf.device.Client      INFO    Connected successfu
lly: d:5myhla:iot_device:12344321
Published Temperature = 8 C Humidity = 92 % soilmoisture = 80 % to IBM Watson
Published Temperature = 31 C Humidity = 30 % soilmoisture = 57 % to IBM Watson
Published Temperature = 61 C Humidity = 23 % soilmoisture = 74 % to IBM Watson
Published Temperature = 23 C Humidity = 90 % soilmoisture = 29 % to IBM Watson
Published Temperature = 35 C Humidity = 54 % soilmoisture = 9 % to IBM Watson
```

6. Flow Chart



7. Observations & Results



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Python 3.7.6 (tags/v3.7.6:43364a7ae0, Dec 18 2019, 23:46:00) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
============ RESTART: C:\Users\prakesh\Desktop\smart agriculture.py ============
2022-11-22 21:32:54,035   ibmiotf.device.Client      INFO    Connected successfully: d:5myhla:iot_device:12344321
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Published Temperature = 23 C Humidity = 90 % soilmoisture = 29 % to IBM Watson
Published Temperature = 35 C Humidity = 54 % soilmoisture = 9 % to IBM Watson
Published Temperature = 21 C Humidity = 39 % soilmoisture = 87 % to IBM Watson
Published Temperature = 82 C Humidity = 48 % soilmoisture = 88 % to IBM Watson
Published Temperature = 76 C Humidity = 55 % soilmoisture = 15 % to IBM Watson
Published Temperature = 38 C Humidity = 18 % soilmoisture = 61 % to IBM Watson
Published Temperature = 55 C Humidity = 98 % soilmoisture = 88 % to IBM Watson
Published Temperature = 16 C Humidity = 42 % soilmoisture = 28 % to IBM Watson
Published Temperature = 65 C Humidity = 35 % soilmoisture = 70 % to IBM Watson
Published Temperature = 8 C Humidity = 64 % soilmoisture = 87 % to IBM Watson
Published Temperature = 17 C Humidity = 53 % soilmoisture = 60 % to IBM Watson
Published Temperature = 52 C Humidity = 12 % soilmoisture = 79 % to IBM Watson
Published Temperature = 20 C Humidity = 30 % soilmoisture = 70 % to IBM Watson
Published Temperature = 9 C Humidity = 13 % soilmoisture = 14 % to IBM Watson
Published Temperature = 78 C Humidity = 22 % soilmoisture = 9 % to IBM Watson
Published Temperature = 41 C Humidity = 76 % soilmoisture = 7 % to IBM Watson
Published Temperature = 37 C Humidity = 4 % soilmoisture = 7 % to IBM Watson
Published Temperature = 4 C Humidity = 23 % soilmoisture = 58 % to IBM Watson
Published Temperature = 39 C Humidity = 58 % soilmoisture = 37 % to IBM Watson
Published Temperature = 30 C Humidity = 95 % soilmoisture = 74 % to IBM Watson
Published Temperature = 0 C Humidity = 98 % soilmoisture = 23 % to IBM Watson
Published Temperature = 2 C Humidity = 3 % soilmoisture = 94 % to IBM Watson
Published Temperature = 90 C Humidity = 10 % soilmoisture = 30 % to IBM Watson
Published Temperature = 96 C Humidity = 15 % soilmoisture = 34 % to IBM Watson
Published Temperature = 39 C Humidity = 1 % soilmoisture = 9 % to IBM Watson
Published Temperature = 39 C Humidity = 64 % soilmoisture = 94 % to IBM Watson
Published Temperature = 30 C Humidity = 7 % soilmoisture = 18 % to IBM Watson
Published Temperature = 66 C Humidity = 16 % soilmoisture = 81 % to IBM Watson
Published Temperature = 26 C Humidity = 64 % soilmoisture = 95 % to IBM Watson
Published Temperature = 85 C Humidity = 49 % soilmoisture = 18 % to IBM Watson
Published Temperature = 11 C Humidity = 70 % soilmoisture = 2 % to IBM Watson
Published Temperature = 59 C Humidity = 3 % soilmoisture = 11 % to IBM Watson
Published Temperature = 4 C Humidity = 38 % soilmoisture = 28 % to IBM Watson
Published Temperature = 57 C Humidity = 29 % soilmoisture = 28 % to IBM Watson
Published Temperature = 50 C Humidity = 70 % soilmoisture = 30 % to IBM Watson
Published Temperature = 42 C Humidity = 42 % soilmoisture = 6 % to IBM Watson
```
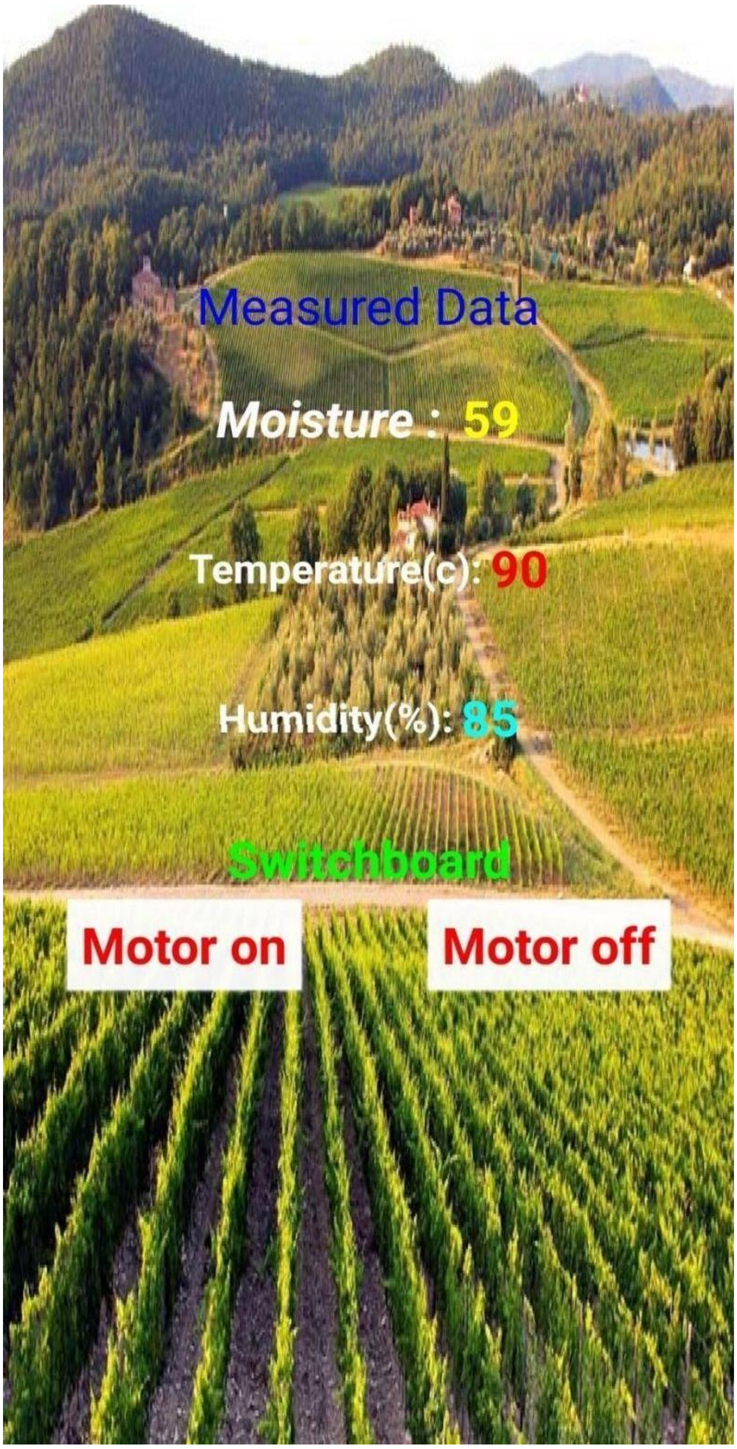
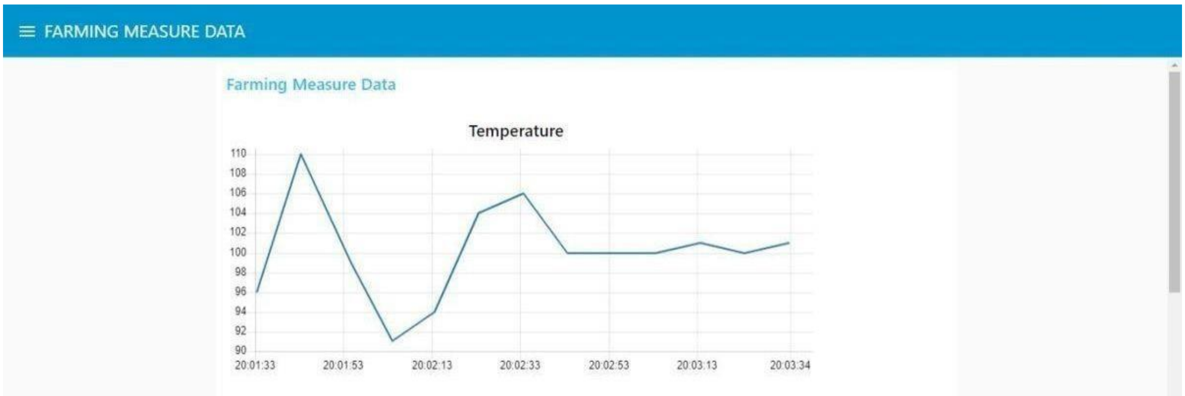



Measured Data

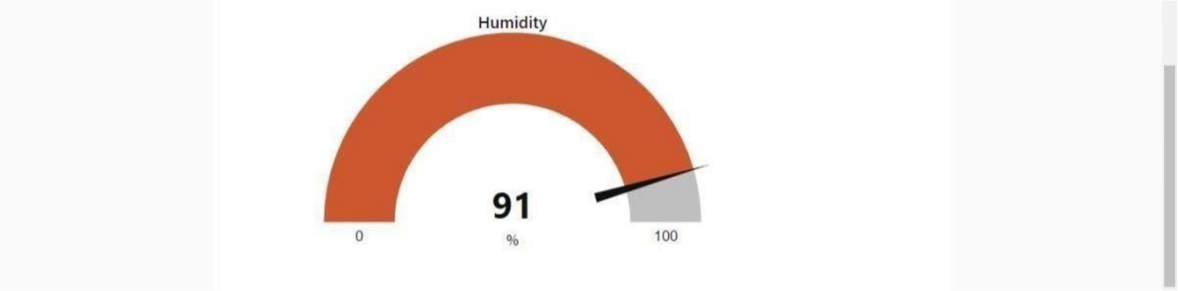
Moisture : 59

Temperature(c): 90

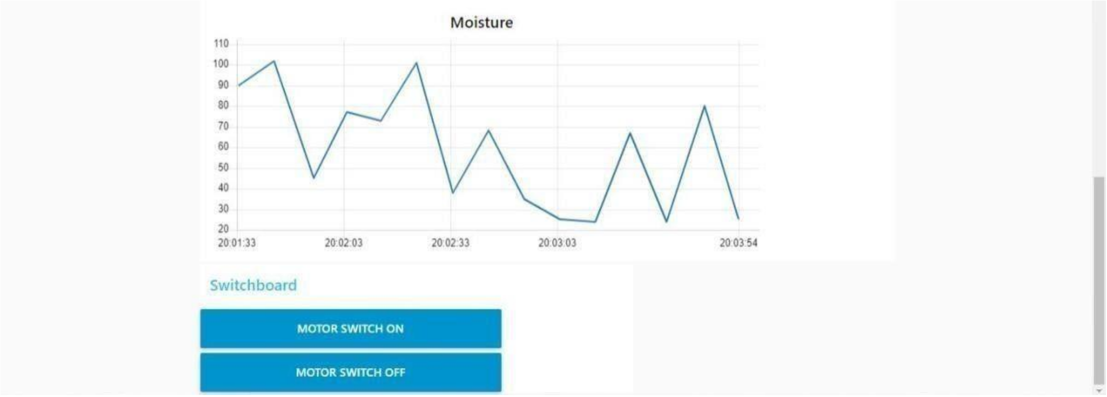
Humidity(%): 85



FARMING MEASURE DATA
Farming Measure Data
Temperature
110
108
106
104
102
100
98
96
94
92
90
20:01:33
20:01:53
20:02:13
20:02:33
20:02:53
20:03:13
20:03:34



Humidity
91
%
0
100



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

8. Advantages & Disadvantages Advantages:

- Farms can be monitored and controlled remotely.
- Increase in convenience to farmers.
- Less labor cost.
- Better standards of living.

Disadvantages:

- Lack of internet/connectivity issues.
- Added cost of internet and internet gateway infrastructure.
- Farmers wanted to adapt the use of Mobile App.

9.Conclusion

Thus the objective of the project to implement an IOT system in order to help farmers to control and monitor their farms has been implemented successfully.