

Smart Farmer - IoT Enabled Smart Farming Application

SPRINT DELIVERY-4

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8. RECEIVING OUTPUT IN IBM CLOUD USING PYTHON PROGRAM

- IBM cloud will receive the data such as soil moisture, Temperature and humidity.
- It also receives commands like Motor On and Motor Off when we press the button in MIT App or Node-RED web.

Recent Events

The recent events listed show the live stream of data that is coming and going from this device.


Event	Value	Format	Last Received
IoTSensor	{"soil_moisture":87,"temperature":16,"humidity"...	json	a few seconds ago
IoTSensor	{"soil_moisture":21,"temperature":-3,"humidity"...	json	a few seconds ago
IoTSensor	{"command":"motoron"}	json	a few seconds ago
IoTSensor	{"command":"motoron"}	json	a few seconds ago
IoTSensor	{"soil_moisture":6,"temperature":57,"humidity":...	json	a few seconds ago

State

This table shows a list of data points that are reported by this device.

 Showing Raw Data | No Interfaces Available

Property	Value	Type	Event	Last Received
soil_moisture	79	Number	IoTSensor	a few seconds ago
temperature	7	Number	IoTSensor	a few seconds ago
humidity	69	Number	IoTSensor	a few seconds ago

Message	Timestamp	
Token auth succeeded: ClientID='dstioda:RASPBERRY_PI:123456789', ClientIP=223.181.239.133, ClientPort=3056, ConnectionId=109919193	Nov 17, 2022 9:55 PM	
Closed connection. The connection was closed by the client or network (5)	Nov 17, 2022 9:53 PM	
Token auth succeeded: ClientID='dstioda:RASPBERRY_PI:123456789', ClientIP=223.181.239.133, ClientPort=2905, ConnectionId=109911464	Nov 17, 2022 9:49 PM	
Closed connection. The connection was closed by the client or network (5)	Nov 17, 2022 9:33 PM	
Token auth succeeded: ClientID='dstioda:RASPBERRY_PI:123456789', ClientIP=223.181.239.133, ClientPort=2983, ConnectionId=153187490	Nov 17, 2022 8:35 PM	
Closed connection. The connection was closed by the client or network (5)	Nov 17, 2022 8:35 PM	

9. PYTHON OUTPUT:

```
smart_agri.py - C:\Users\puppy\AppData\Local\Programs\Python\Python37\smart_agri.py (3.7.4)
File Edit Format Run Options Window Help

import wiotp.sdk.device
import wiotp.sdk.application
import time
import os
import datetime
import random
myconfig={
    "identity":{
        "orgId":"stioda",
        "typeId":"RASPBERRY_PI",
        "deviceId":"123456789",
        "auth":{
            "token":"123456789"
        }
    }
}
client=wiotp.sdk.device.DeviceClient()
client.connect()

def myCommandCallback(cmd):
    print("Message received from IBM Iot platform: ",cmd)
    m=cmd.data['command']
    if(m=="motoron"):
        print("Motor is switched on")
    elif(m=="motoroff"):
        print("Motor is switched off")
    else:
        print("Invalid command")
while(True):
    soil=random.randint(0,100)
    temp=random.randint(-20,125)
    hum=random.randint(0,100)
    myData={'soil_moisture':soil,'temperature':temp,'humidity':hum}
    client.publishEvent("IoTSensorData",myData)
    print("Published data Successfully: ('soil_moisture':",soil,', 'temperature':",temp,', 'humidity':",hum)
    time.sleep(2)
    client.commandCallback=myCommandCallback
    client.disconnect()
```

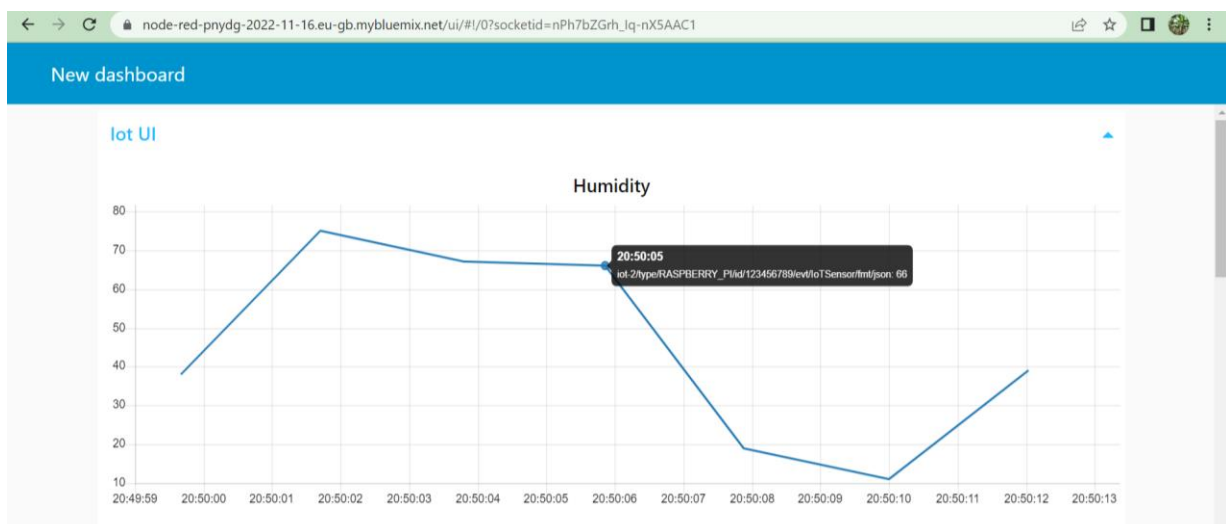
```
*Python 3.7.4 Shell*
File Edit Shell Debug Options Window Help

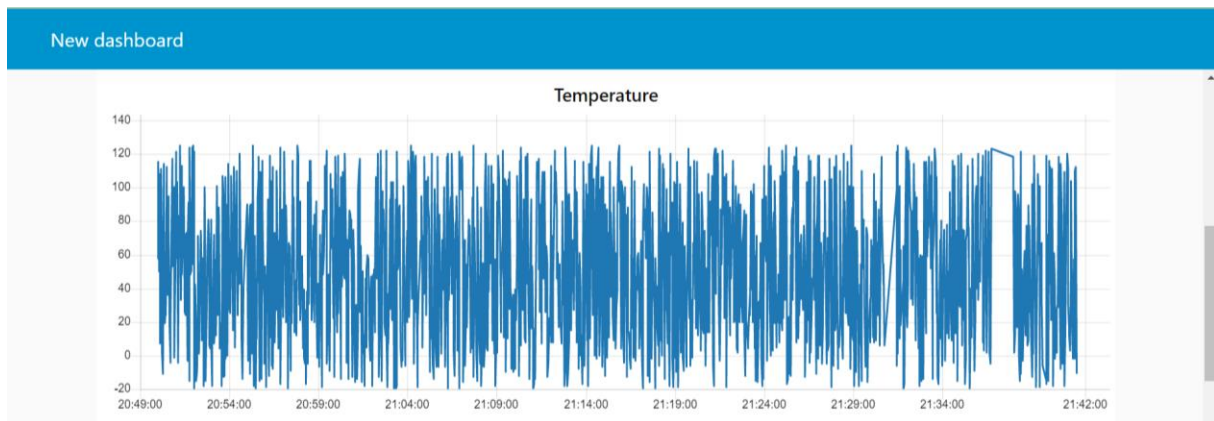
Published data Successfully: ('soil_moisture': 73, 'temperature': 96, 'humidity': 52)
Published data Successfully: ('soil_moisture': 25, 'temperature': 43, 'humidity': 39)
Published data Successfully: ('soil_moisture': 31, 'temperature': 11, 'humidity': 3)
Published data Successfully: ('soil_moisture': 25, 'temperature': -9, 'humidity': 37)
Message received from IBM Iot platform: motoron
Motor is switched on
Published data Successfully: ('soil_moisture': 28, 'temperature': 41, 'humidity': 61)
Message received from IBM Iot platform: motoroff
Motor is switched OFF
Message received from IBM Iot platform: motoron
Motor is switched on
Published data Successfully: ('soil_moisture': 31, 'temperature': -8, 'humidity': 44)
Message received from IBM Iot platform: motoroff
Motor is switched OFF
Published data Successfully: ('soil_moisture': 19, 'temperature': 26, 'humidity': 53)
Message received from IBM Iot platform: motoron
Motor is switched on
Published data Successfully: ('soil_moisture': 33, 'temperature': 83, 'humidity': 48)
Published data Successfully: ('soil_moisture': 20, 'temperature': 114, 'humidity': 44)
Published data Successfully: ('soil_moisture': 94, 'temperature': 51, 'humidity': 85)
```

10. NODE-RED OUTPUT

Web Application Output:

- Temperature and Humidity values was uploaded in the Node-RED and it was shown in the design of Graph with changing random values.
- Soil Moisture was shown using the gauge node.





11. MIT APP INVENTOR OUTPUT

SIGN UP WINDOW:

- The sign-up window will pop up first when we open the app. Fill the username and password and press the sign up window

4:14

SIGN UP/ SIGN IN

SIGN UP

Username Agriculture

Password

SIGN UP LOGIN

LOGIN WINDOW:

- The login window was filled with updated username and password.

4:17

LOGIN FORM

SIGN IN

User Name Agriculture

Password

Login

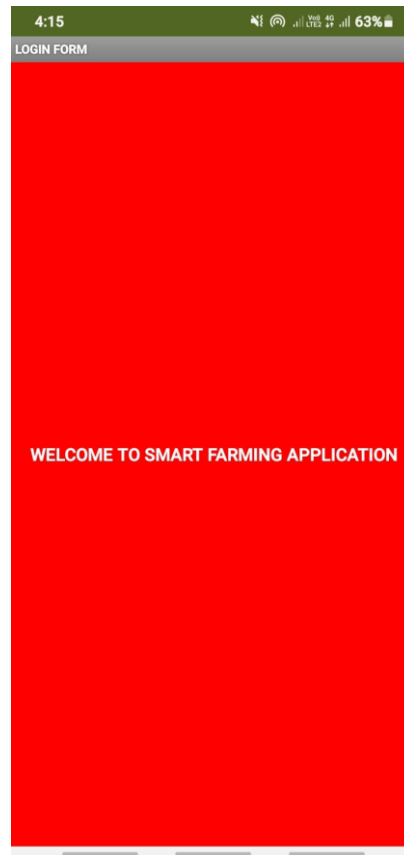
LOGIN WINDOW:

- Error will come if we give wrong username or wrong password.

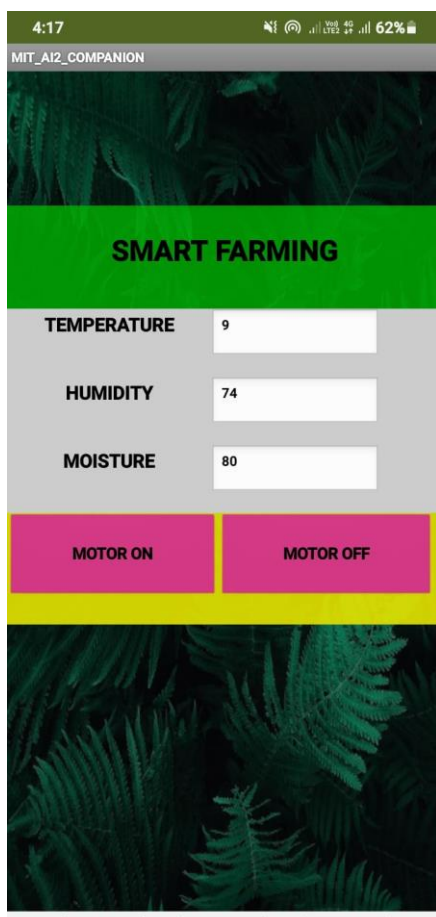


APP OPENING WINDOW:

- A red coloured screen was opened when you give the right username and password and this will indicate the successful opening of main screen.

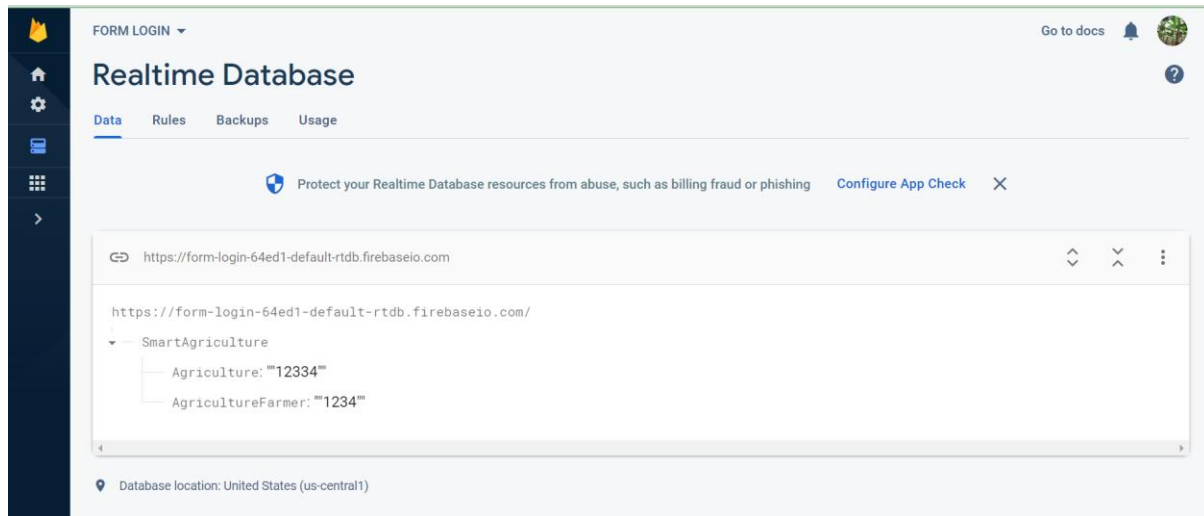


MAIN SCREEN:



12. DATABASE FOR STORING LOGIN ID INFORMATION

- Username and Password was stored successfully in Firebase database.



13. ADVANTAGES AND DISADVANTAGES

ADVANTAGES:

- It allows farmers to maximize yields using minimum resources such as water, fertilizers, seeds etc.
- Solar powered and mobile operated pumps save cost of electricity.
- Smart agriculture use drones and robots which helps in many ways. These improves data collection process and helps in wireless monitoring and control.
- It is cost effective method.
- It delivers high quality crop production.

DISADVANTAGES:

- The smart agriculture needs availability of internet continuously. Rural part of most of the developing countries do not fulfil this requirement. Moreover internet connection is slower.
- The smart farming based equipments require farmers to understand and learn the use of technology. This is major challenge in adopting smart agriculture farming at large scale across the countries.
- The Cost Involved in Smart Agriculture.
- There could be wrong Analysis of Weather Conditions.
- Increased channel maintenance.

14. CONCLUSION

Thus, the objective of the project was implemented successfully using IoT technology. The required Software simulation was done using Node-RED and MIT App Inventor which will help farmers to turn on motor on and off in their place with help of mobile application.

15. BIBLIOGRAPHY

IBM WATSON CLOUD: <https://cloud.ibm.com/login>

NODE-RED: <https://node-red-pnydg-2022-11-16.eu-gb.mybluemix.net/red/#flow/0af9f7b1c2a47c1b>

MIT APP INVENTOR: <http://ai2.appinventor.mit.edu/#5561748011483136>