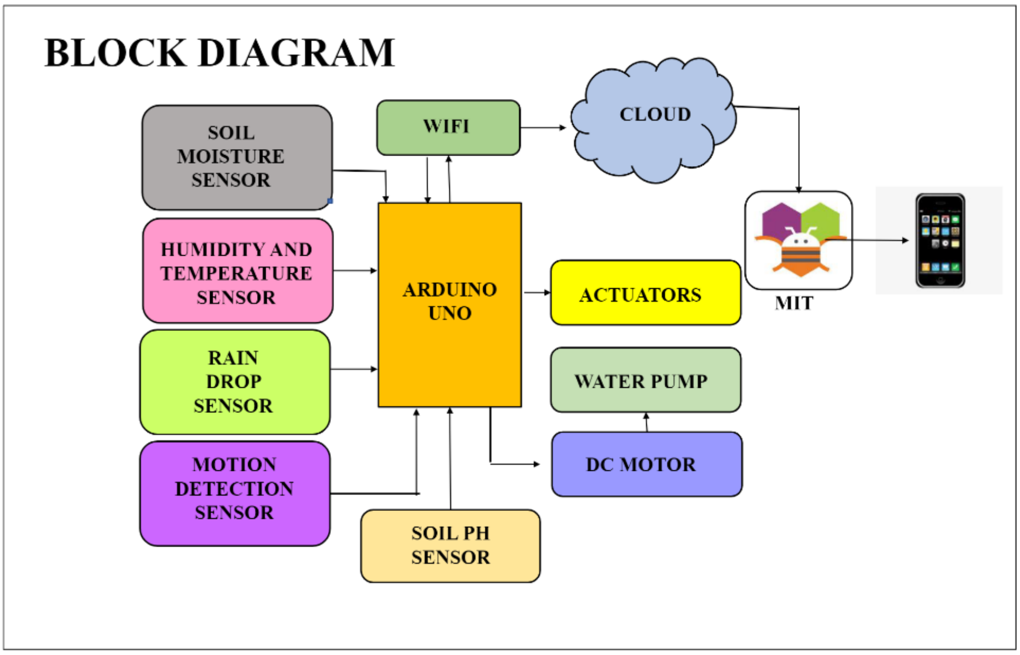
Project Development -Delivery of Sprint-4

Date	18 NOV 2022
Team ID	PNT2022TMID18233
Project Name	Project -Smart farmer-IOT enabled smart Farming Application

Flow Diagram



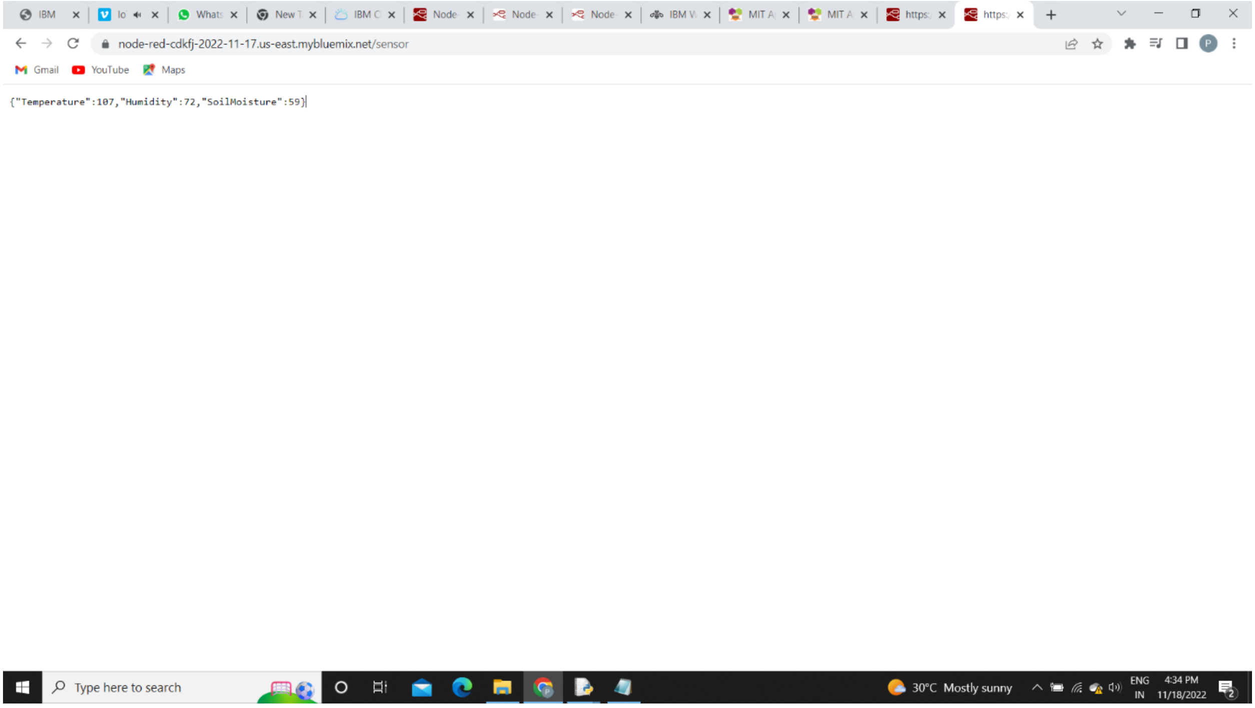
Python Code:

- **For Connecting IBM Cloud**
- **For NODE RED**
- **Weather Map Information**
- **MIT App Inventor**

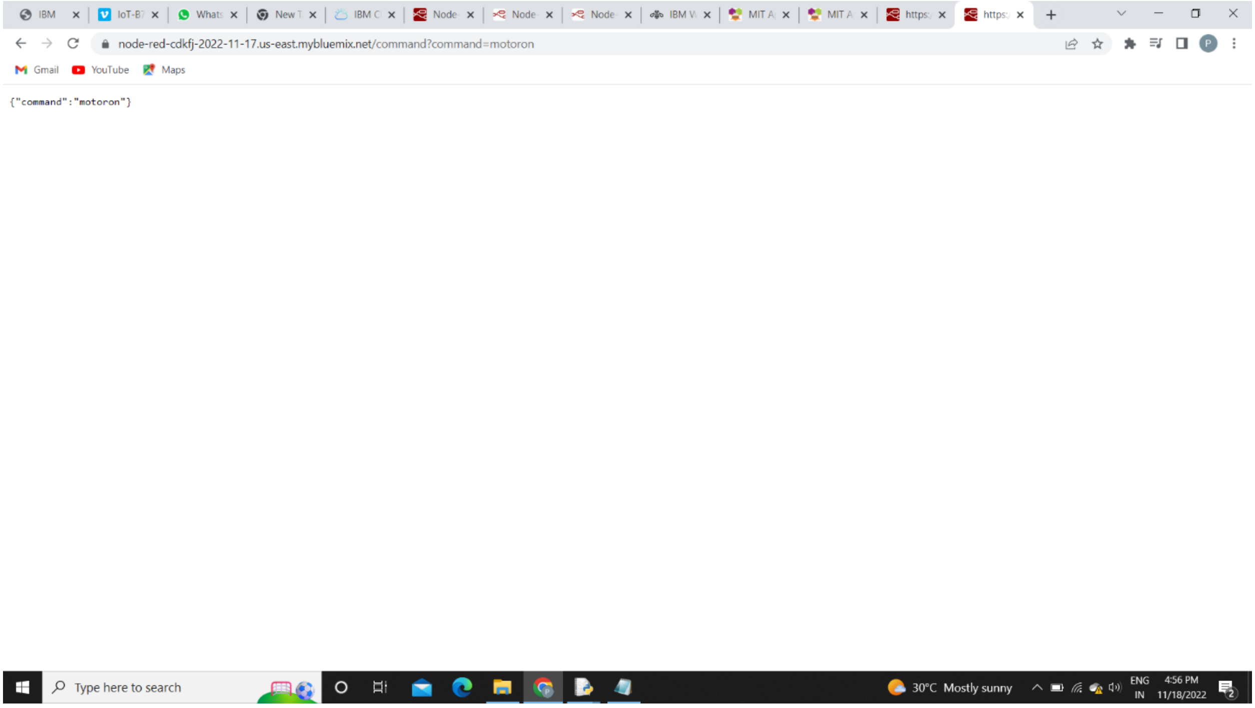
```
  "auth": {
```

```
import time
import sys
import ibmiotf.application
import ibmiotf.device
import paho.mqtt.client as mqtt
import random

organization="6eut6z"
deviceType="IOT"
deviceId="21"
authMethod="token"
authToken="12345678"


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")
    else:
        print("please send proper command")
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 connection device:%s" %str(e))
    sys.exit()

while True:
    temp=random.randint(90,110)
    humidity=random.randint(60,100)

    data={'Temperature':temp,'Humidity':humidity}
    def myonPublishCallback():
        print("published Temperature=%s C"%temp,"Humidity=%s%%" %humidity,"to IBM Watson")
    success=deviceCli.publishEvent("IoTSensor","json",data,qos=0,on_publish=myonPublishCallback)
    if not success:
        print("Not connected to IoTF")
    time.sleep(10)
    deviceCli.commandCallback=myCommandCallback

deviceCli.disconnect()
```

Nodered output:

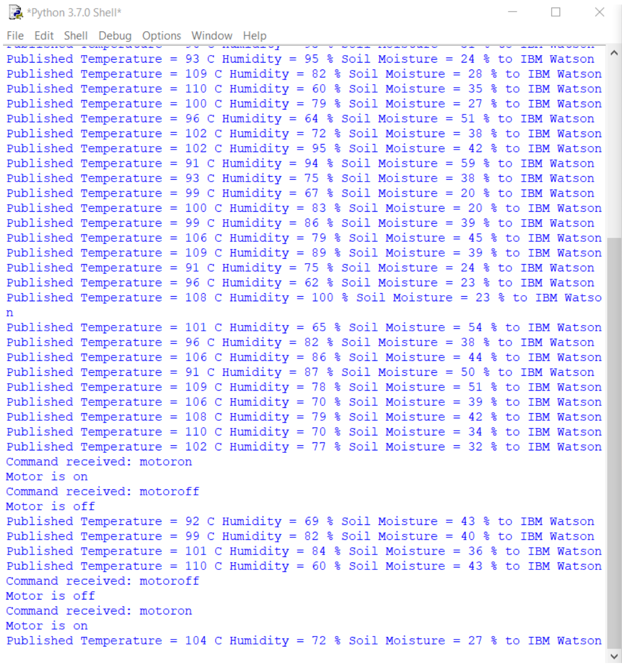


```
{"Temperature":107,"Humidity":72,"SoilMoisture":59}
```

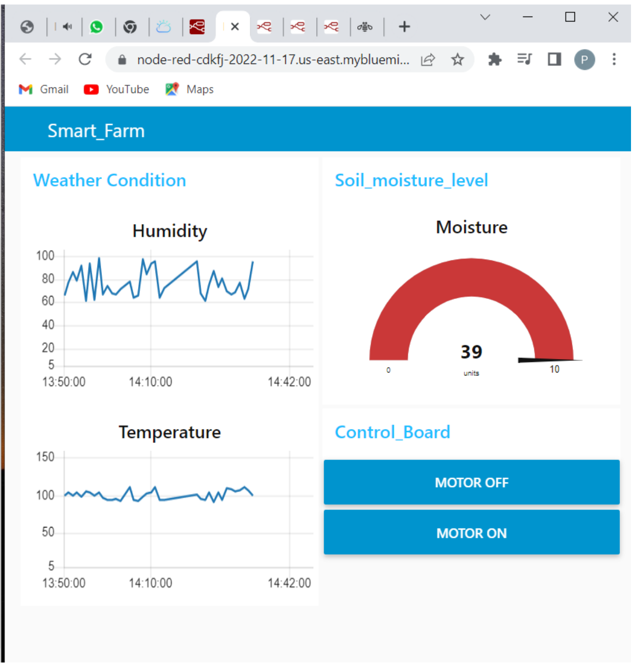


```
{"command":"motoron"}
```

Running Module

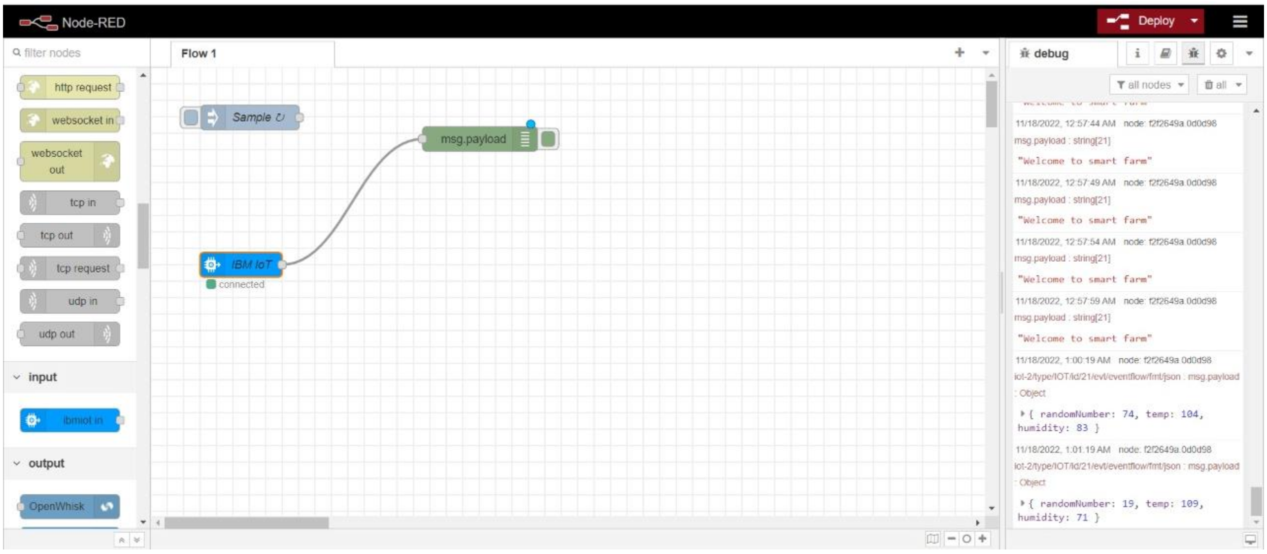


```
Published Temperature = 93 C Humidity = 95 % Soil Moisture = 24 % to IBM Watson
Published Temperature = 109 C Humidity = 82 % Soil Moisture = 28 % to IBM Watson
Published Temperature = 110 C Humidity = 60 % Soil Moisture = 35 % to IBM Watson
Published Temperature = 100 C Humidity = 79 % Soil Moisture = 27 % to IBM Watson
Published Temperature = 96 C Humidity = 64 % Soil Moisture = 51 % to IBM Watson
Published Temperature = 102 C Humidity = 72 % Soil Moisture = 38 % to IBM Watson
Published Temperature = 102 C Humidity = 95 % Soil Moisture = 42 % to IBM Watson
Published Temperature = 91 C Humidity = 94 % Soil Moisture = 59 % to IBM Watson
Published Temperature = 93 C Humidity = 75 % Soil Moisture = 38 % to IBM Watson
Published Temperature = 99 C Humidity = 67 % Soil Moisture = 20 % to IBM Watson
Published Temperature = 100 C Humidity = 83 % Soil Moisture = 20 % to IBM Watson
Published Temperature = 99 C Humidity = 86 % Soil Moisture = 39 % to IBM Watson
Published Temperature = 106 C Humidity = 79 % Soil Moisture = 45 % to IBM Watson
Published Temperature = 109 C Humidity = 89 % Soil Moisture = 39 % to IBM Watson
Published Temperature = 91 C Humidity = 75 % Soil Moisture = 24 % to IBM Watson
Published Temperature = 96 C Humidity = 62 % Soil Moisture = 23 % to IBM Watson
Published Temperature = 108 C Humidity = 100 % Soil Moisture = 23 % to IBM Watso
n
Published Temperature = 101 C Humidity = 65 % Soil Moisture = 54 % to IBM Watson
Published Temperature = 96 C Humidity = 82 % Soil Moisture = 38 % to IBM Watson
Published Temperature = 106 C Humidity = 86 % Soil Moisture = 44 % to IBM Watson
Published Temperature = 91 C Humidity = 87 % Soil Moisture = 50 % to IBM Watson
Published Temperature = 109 C Humidity = 78 % Soil Moisture = 51 % to IBM Watson
Published Temperature = 106 C Humidity = 70 % Soil Moisture = 39 % to IBM Watson
Published Temperature = 108 C Humidity = 79 % Soil Moisture = 42 % to IBM Watson
Published Temperature = 110 C Humidity = 70 % Soil Moisture = 34 % to IBM Watson
Published Temperature = 102 C Humidity = 77 % Soil Moisture = 32 % to IBM Watson
Command received: motoron
Motor is on
Command received: motoroff
Motor is off
Published Temperature = 92 C Humidity = 69 % Soil Moisture = 43 % to IBM Watson
Published Temperature = 99 C Humidity = 82 % Soil Moisture = 40 % to IBM Watson
Published Temperature = 101 C Humidity = 84 % Soil Moisture = 36 % to IBM Watson
Published Temperature = 110 C Humidity = 60 % Soil Moisture = 43 % to IBM Watson
Command received: motoroff
Motor is off
Command received: motoron
Motor is on
Published Temperature = 104 C Humidity = 72 % Soil Moisture = 27 % to IBM Watson
```

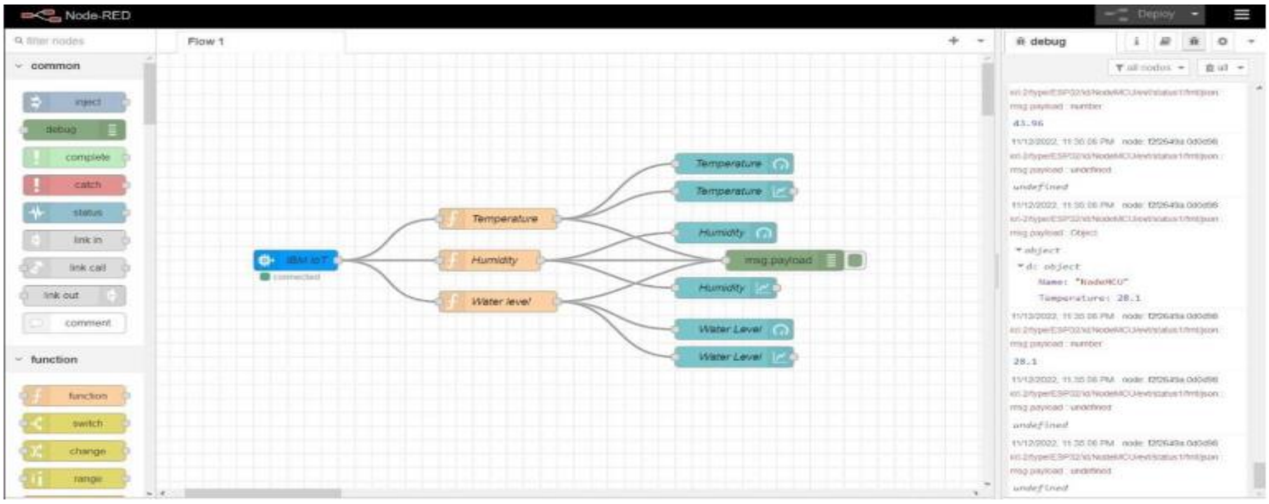


NODE RED Flow Connections

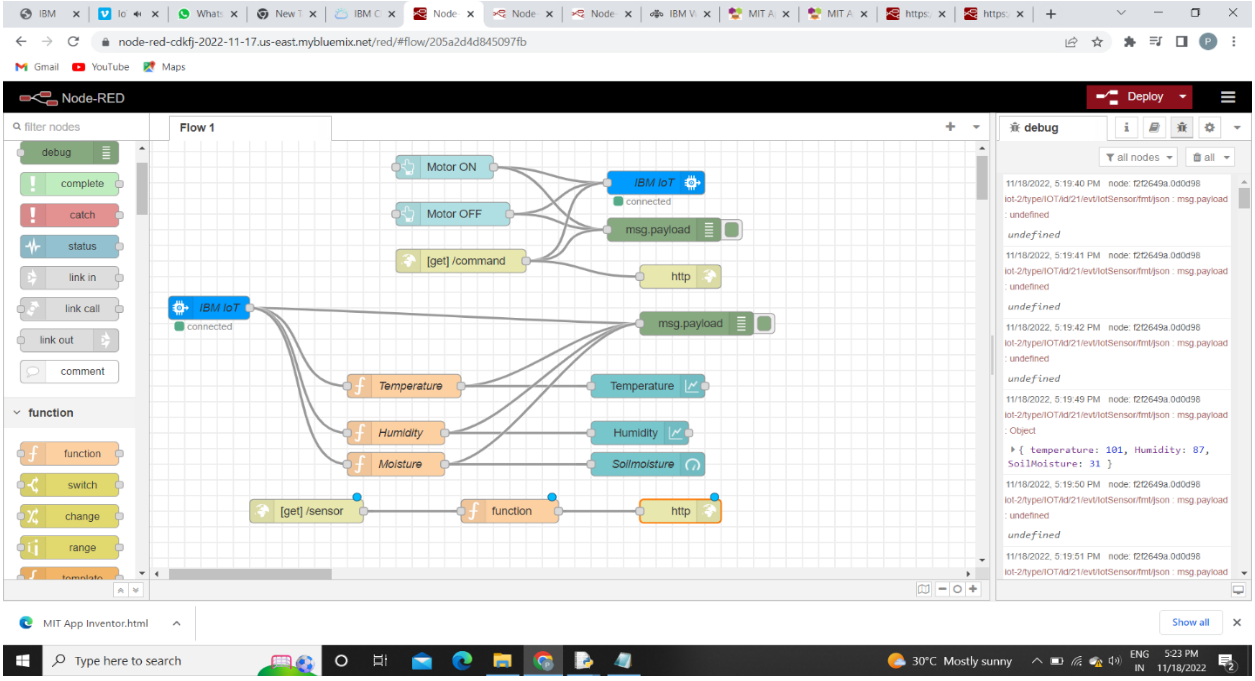
- **Interfacing IBM Cloud**
- **Intefacing & Getting Sensor Datas**
- **Connecting MIT App Inventor**
- **Weather Map Parameters**



```
11/18/2022, 12:57:44 AM   node: f2f2649a.0d0d98
msg.payload : string[21]
"Welcome to smart farm"
11/18/2022, 12:57:49 AM   node: f2f2649a.0d0d98
msg.payload : string[21]
"Welcome to smart farm"
11/18/2022, 12:57:54 AM   node: f2f2649a.0d0d98
msg.payload : string[21]
"Welcome to smart farm"
11/18/2022, 12:57:59 AM   node: f2f2649a.0d0d98
msg.payload : string[21]
"Welcome to smart farm"
11/18/2022, 1:00:19 AM   node: f2f2649a.0d0d98
iot-2/type/IOT/id/21/evt/eventflow/fmt/json : msg.payload
: Object
▸{ randomNumber: 74, temp: 104,
humidity: 83 }
11/18/2022, 1:01:19 AM   node: f2f2649a.0d0d98
iot-2/type/IOT/id/21/evt/eventflow/fmt/json : msg.payload
: Object
▸{ randomNumber: 19, temp: 109,
humidity: 71 }
```

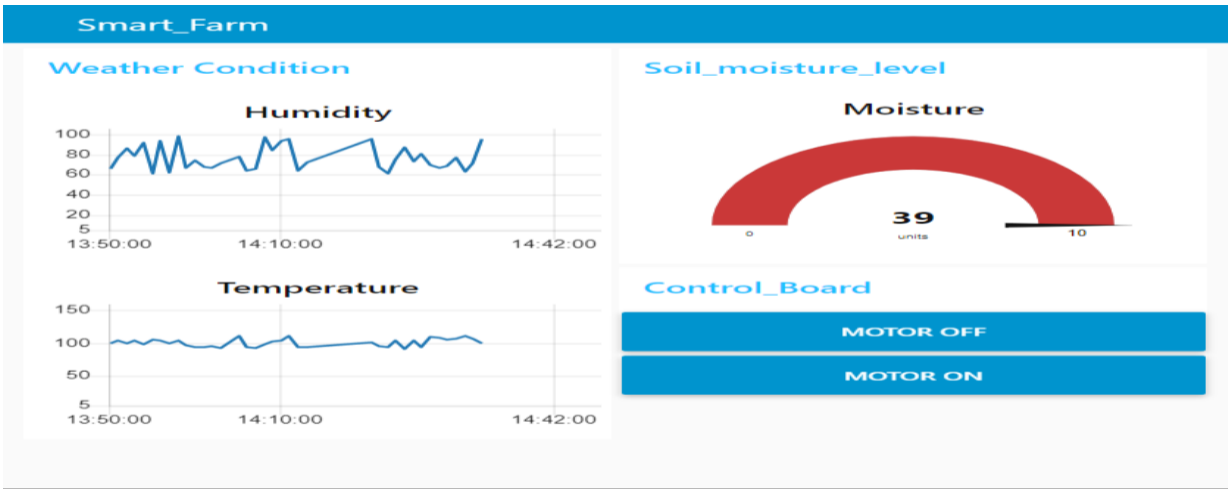


```
iot-2/type/ESP32/id/NodeMCU/evt/status1/fmt/json :
msg.payload : number
43.96
11/12/2022, 11:35:06 PM   node: f2f2649a.0d0d98
iot-2/type/ESP32/id/NodeMCU/evt/status1/fmt/json :
msg.payload : undefined
undefined
11/12/2022, 11:35:06 PM   node: f2f2649a.0d0d98
iot-2/type/ESP32/id/NodeMCU/evt/status1/fmt/json :
msg.payload : Object
▾object
 ▾d: object
   Name: "NodeMCU"
   Temperature: 28.1
11/13/2022, 11:35:06 PM   node: f2f2649a.0d0d98
iot-2/type/ESP32/id/NodeMCU/evt/status1/fmt/json :
msg.payload : number
28.1
11/12/2022, 11:35:06 PM   node: f2f2649a.0d0d98
iot-2/type/ESP32/id/NodeMCU/evt/status1/fmt/json :
msg.payload : undefined
undefined
11/12/2022, 11:35:06 PM   node: f2f2649a.0d0d98
iot-2/type/ESP32/id/NodeMCU/evt/status1/fmt/json :
msg.payload : undefined
undefined
```



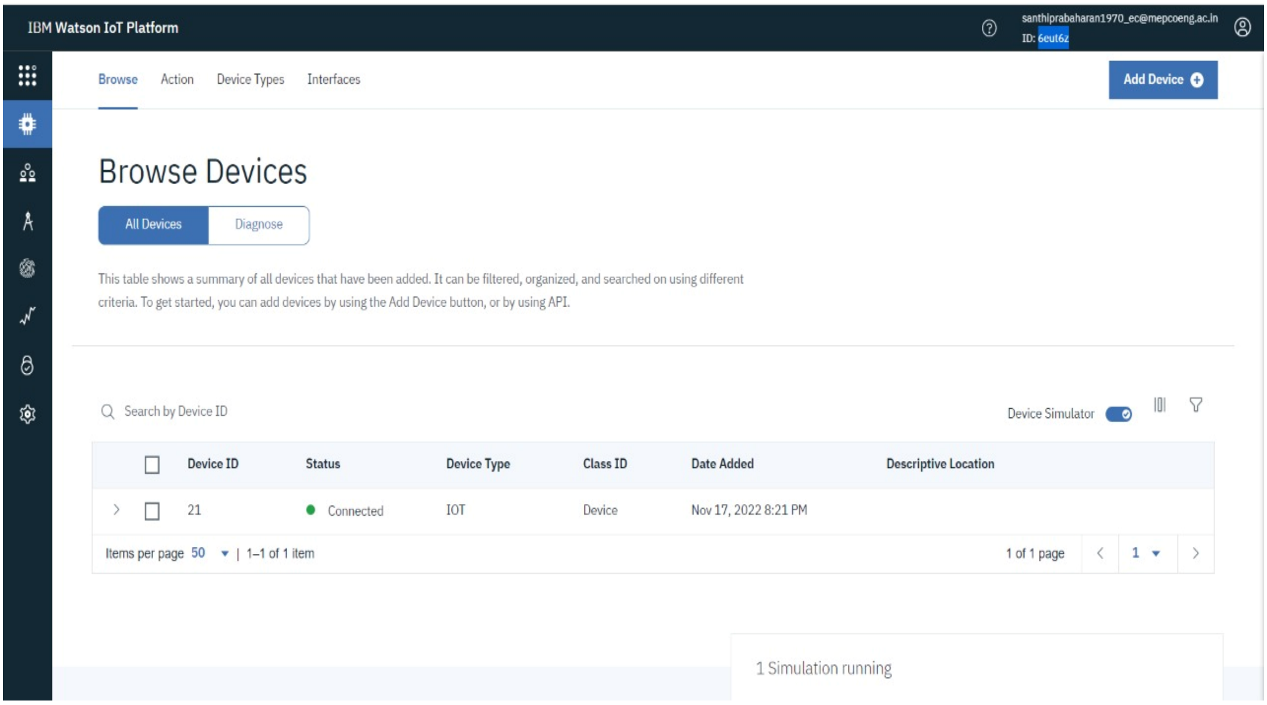
```
11/18/2022, 5:19:40 PM   node: f2f2649a.0d0d98
iot-2/type/IOT/id/21/evt/IotSensor/fmt/json : msg.payload
: undefined
undefined
11/18/2022, 5:19:41 PM   node: f2f2649a.0d0d98
iot-2/type/IOT/id/21/evt/IotSensor/fmt/json : msg.payload
: undefined
undefined
11/18/2022, 5:19:42 PM   node: f2f2649a.0d0d98
iot-2/type/IOT/id/21/evt/IotSensor/fmt/json : msg.payload
: undefined
undefined
11/18/2022, 5:19:49 PM   node: f2f2649a.0d0d98
iot-2/type/IOT/id/21/evt/IotSensor/fmt/json : msg.payload
: Object
 ▸{ temperature: 101, Humidity: 87,
SoilMoisture: 31 }
11/18/2022, 5:19:50 PM   node: f2f2649a.0d0d98
iot-2/type/IOT/id/21/evt/IotSensor/fmt/json : msg.payload
: undefined
undefined
11/18/2022, 5:19:51 PM   node: f2f2649a.0d0d98
iot-2/type/IOT/id/21/evt/IotSensor/fmt/json : msg.payload
```

Web API Output :



IBM Watson IoT Platform

- **Device Connected Details**



IBM Watson IoT Platform

santhiprabaharan1970_ec@mepcoeng.ac.in
ID: 6eut6z

Browse Action Device Types Interfaces

Add Device

Browse Devices

All Devices Diagnose

This table shows a summary of all devices that have been added. It can be filtered, organized, and searched on using different criteria. To get started, you can add devices by using the Add Device button, or by using API.

Search by Device ID

Device Simulator

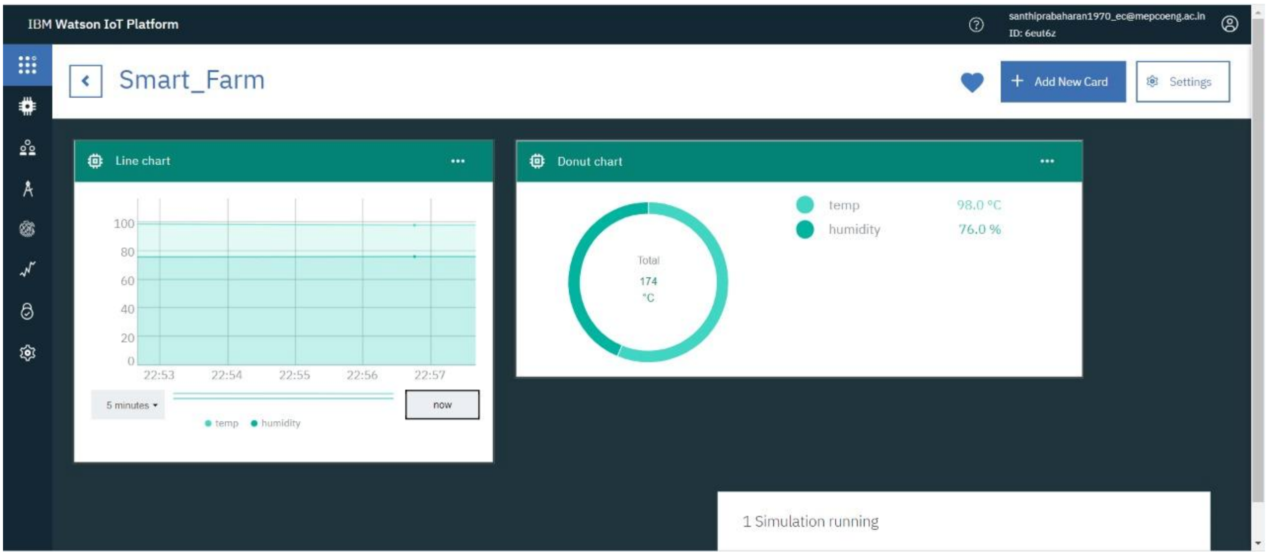
	Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
□	21	● Connected	IOT	Device	Nov 17, 2022 8:21 PM	

Items per page 50 | 1–1 of 1 item 1 of 1 page 1

1 Simulation running

Live Date Output Of IBM Watson Iot Platform

- **Sensor Output Data**
- **Weather Condition**



IBM Watson IoT Platform

santhiprabaharan1970_ec@mepcoeng.ac.in
ID: 6eut6z

Smart_Farm

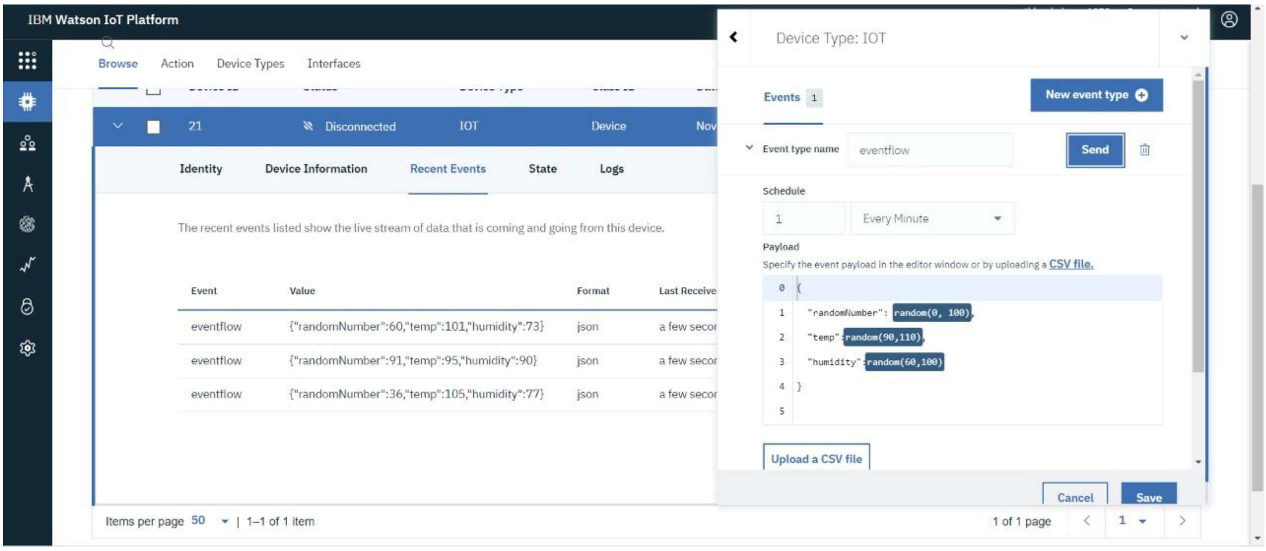
Add New Card Settings

Line chart

Donut chart

temp	98.0 °C
humidity	76.0 %

1 Simulation running



21 Disconnected IOT Device Nov

Identity | Device Information | Recent Events | State | Logs

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

Event	Value	Format	Last Receive
eventflow	{"randomNumber":60,"temp":101,"humidity":73}	json	a few secor
eventflow	{"randomNumber":91,"temp":95,"humidity":90}	json	a few secor
eventflow	{"randomNumber":36,"temp":105,"humidity":77}	json	a few secor

Items per page 50 | 1–1 of 1 item

1 of 1 page 1

Event type name: eventflow

Schedule: 1 Every Minute

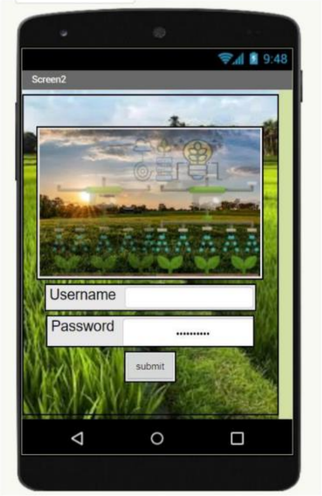
Payload

Specify the event payload in the editor window or by uploading a CSV file.

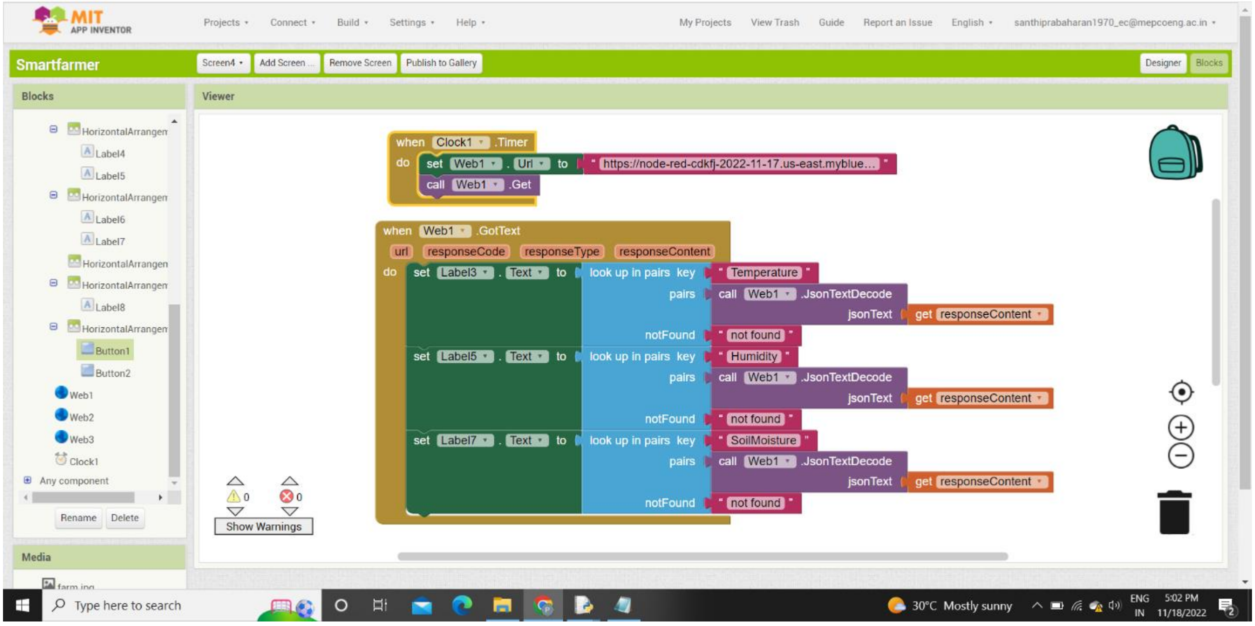
```
{
  "randomNumber": random(0, 100),
  "temp":random(90,110),
  "humidity":random(60,100)
}
```

MIT APP INVENTOR

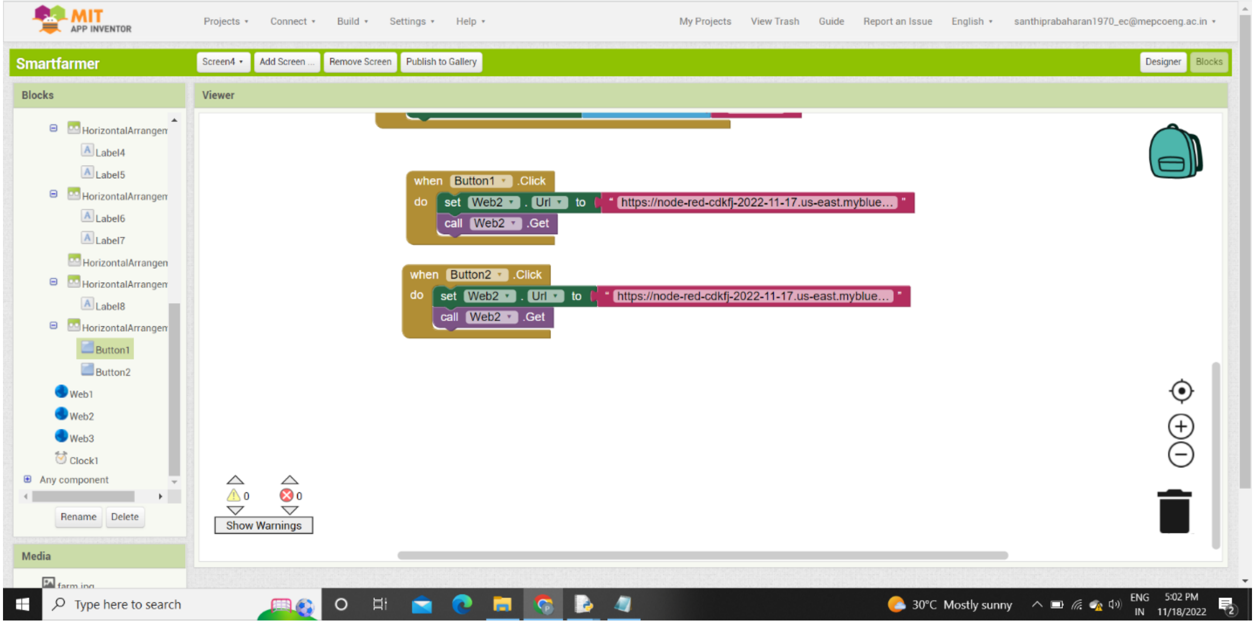
- **Design**



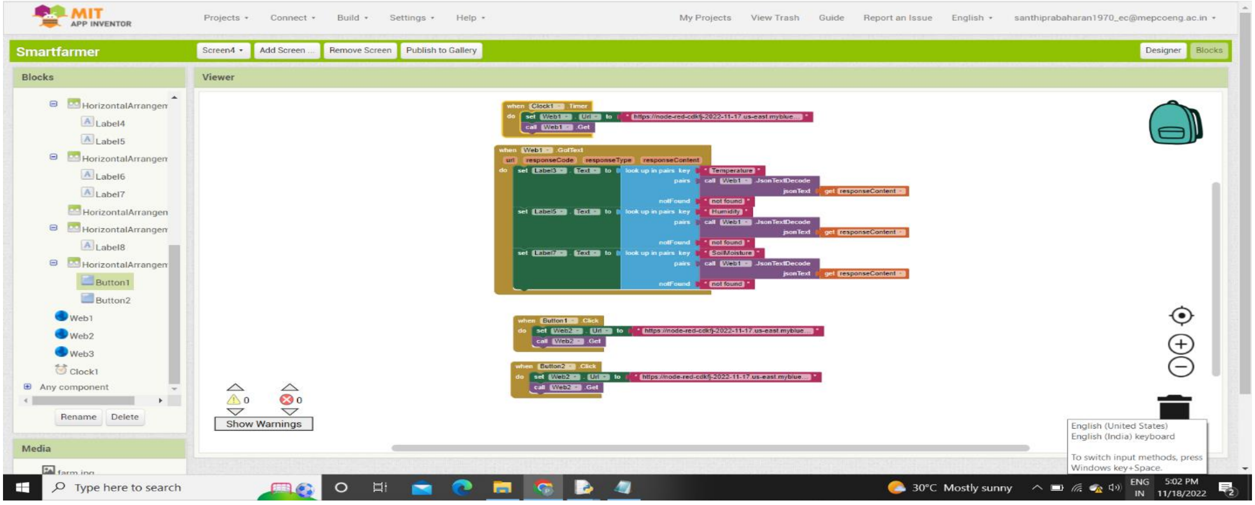
Back End Process(Block)



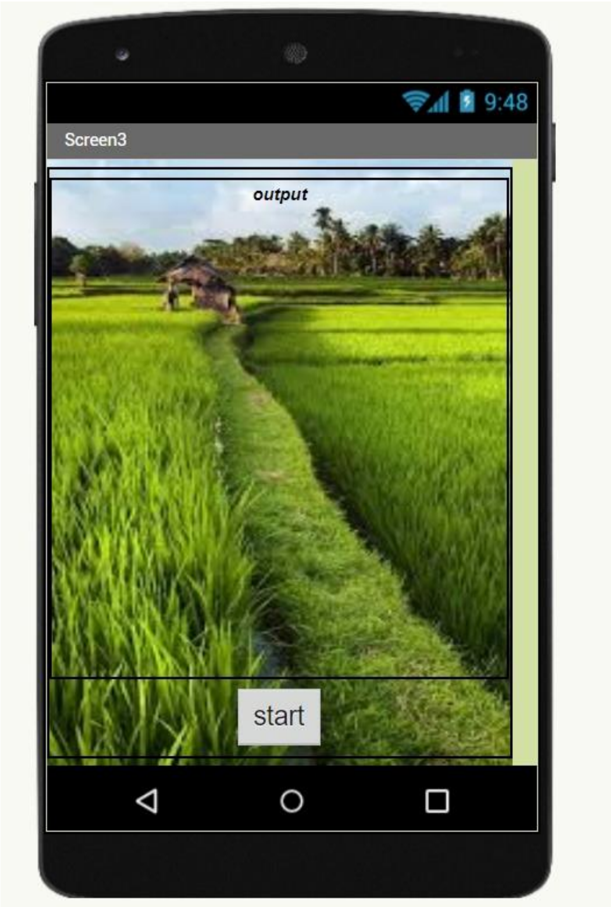
```
when Clock1 .Timer
do  set Web1 . Url to " https://node-red-cdkfj-2022-11-17.us-east.myblue... "
    call Web1 .Get

when Web1 .GotText
url  responseCode  responseType  responseContent
do  set Label3 . Text to  look up in pairs key " Temperature "
                                         pairs  call Web1 .JsonTextDecode
                                                            jsonText  get responseContent
                                      notFound " not found "
    set Label5 . Text to  look up in pairs key " Humidity "
                                         pairs  call Web1 .JsonTextDecode
                                                            jsonText  get responseContent
                                      notFound " not found "
    set Label7 . Text to  look up in pairs key " SoilMoisture "
                                         pairs  call Web1 .JsonTextDecode
                                                            jsonText  get responseContent
                                      notFound " not found "
```

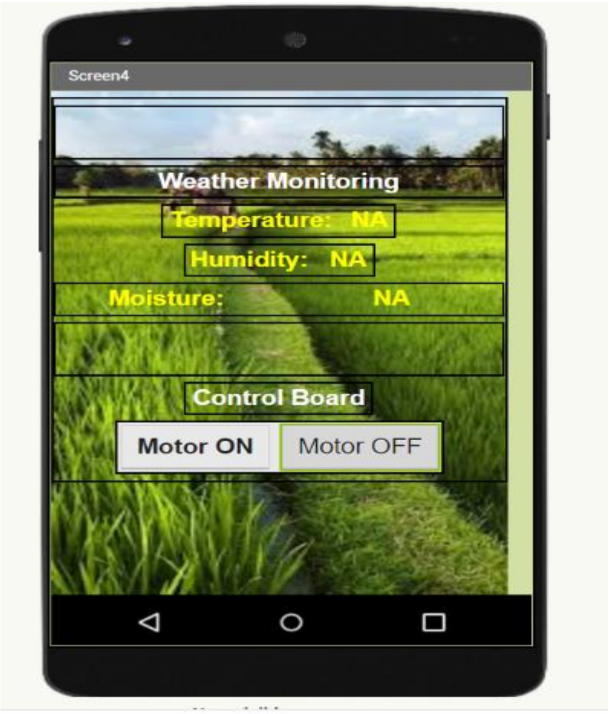

MIT APP INVENTOR
Projects ▾ Connect ▾ Build ▾ Settings ▾ Help ▾
My Projects View Trash Guide Report an Issue English ▾ santhiprabaharan1970_ec@mepcoeng.ac.in ▾
Smartfarmer
Screen4 ▾ Add Screen ... Remove Screen Publish to Gallery
Designer Blocks
Blocks
Viewer
Any component
Rename Delete
Media
⚠ 0 ⊗ 0
Show Warnings
Type here to search
30°C Mostly sunny
ENG IN 5:02 PM 11/18/2022

```
when Button1 .Click
do  set Web2 . Url to " https://node-red-cdkfj-2022-11-17.us-east.myblue... "
    call Web2 .Get

when Button2 .Click
do  set Web2 . Url to " https://node-red-cdkfj-2022-11-17.us-east.myblue... "
    call Web2 .Get
```



Mobile Application Ouput





Temperature: NA

Humidity: NA

Moisture: NA