REPORT

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PROJECT NAME : SMART AGRICULTURE SYSTEM BASED ON IOT

DATE :15-06-2020

PROJECT OVERVIEW

SMART AGRICULTURE SYSTEM IS COMMERCIALLY SCALABLE METHOD WHICH IS BEING BUILT TO REDUCE THE EFFORTS OF FARMERES.THIS PROJECT WILL SOLVE THE MOST IMPORTANT PROBLEM THE FARMERS ARE FACING THAT IS WATERING THE CROPS AT RIGHT TIME AND ACCORDING TO THE REAL TIME FIELD CONDITIONS.

THERE ARE MANY THINGS TO TAKE CARE OF, WHILE WATERING OF CROPS.IF WE WATER THE CROPS TO MUCH, THE CROPS CAN GET DAMAGED DUE TOP WATER LOGGING.IF WE WATER THE CROPS ON A RAINY DAY ,THE EXTRA RAINWATER MAY TAMPER THE GROWTH OF CROPS.IF IN ANY CASE THE FARMER FORGET TO WETER THE CROPS FOR ONE DAY OR TWO BECAUSE OF ANY REASON,IT CAN AGAIN MAKE THE SOIL TWO DRY FOR THE PLANTS TO GET THEIR DAILY NUTRITION LEVEL.

CONSIDERING MANY FACTS ,THE PROJECT IS MAINLY FOCUSED ON AUTOMATING THE PROCESS OF WATER PUMP AND PROVIDING THE FARMERS WITH AN APPLICATION WHERE THEY CAN SEE THE STATUS OF THE PUMP,MOISTURE OF THE SOIL,HUMIDITY ,TEMPERATURE AS WELL AS WEATHER FORECASTING SO THE FARMER CAN MANY ARRANGEMENTS ACCORDINGLY.

THE ULTIMATE GOAL OF THE PROJECT IS TO INCREASE THE QUALITY OF YIELD BY TAKING CARE OF IRRIGATION PROCESS AND STARING THE REVOLUTIONARY ERA OF FARMERS BY BRINGING TECHNOLGY INTO THE DOMAIN.

PROJECT SCOPE

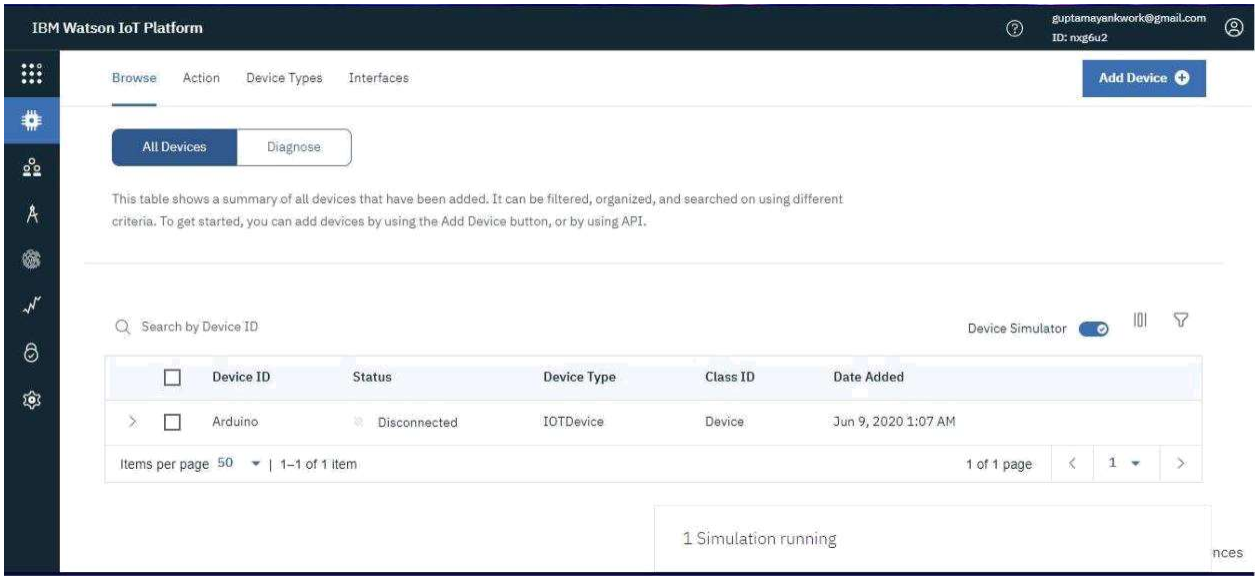
-WE ARE DEVELOPING AN UI FOR THE FARMERS TO HELP THEM CONTROL THE REAL FIELD PARAMETERS SUCH AS TEMPERATURE,HUMIDITY AND SOIL MOISTURE IN ORDER TO IRRIGATE THE FIELD ACCORDINGLY.

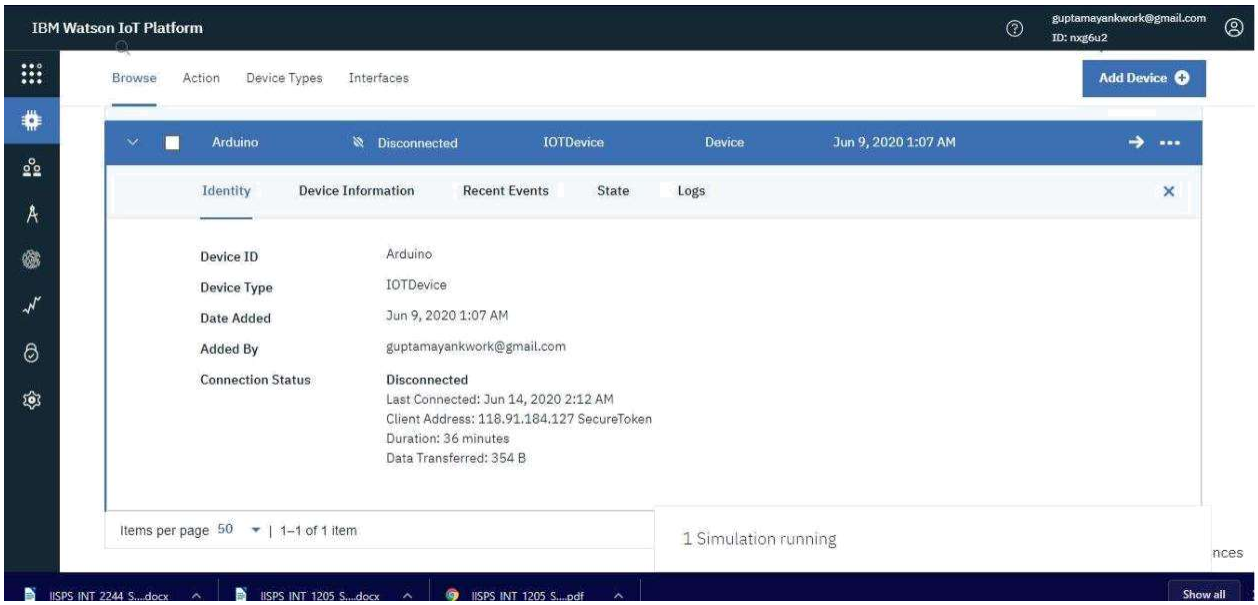
-THE UI IS BUILD USING NODE RED.

-THE IBM CLOUD IS USED TO STORE DATA FROM IBM WATSON IOT SIMULATOR WHICH IS KIND OF VIRTUAL SENSOR.

-THIS UI WILL HELP THE FARMERS CONTROL THE IRRIGATION ACCORDING TO THE FIELD PARAMETERS AND THEY CAN DO SO FROM ANYWHERE.

USE OF IBM WATSON




IBM Watson IoT Platform
guptamayankwork@gmail.com
ID: nxg6u2
Browse
Action
Device Types
Interfaces
Add Device
Arduino
Disconnected
IOTDevice
Device
Jun 9, 2020 1:07 AM
Identity
Device Information
Recent Events
State
Logs
Device ID
Arduino
Device Type
IOTDevice
Date Added
Jun 9, 2020 1:07 AM
Added By
guptamayankwork@gmail.com
Connection Status
Disconnected
Last Connected: Jun 14, 2020 2:12 AM
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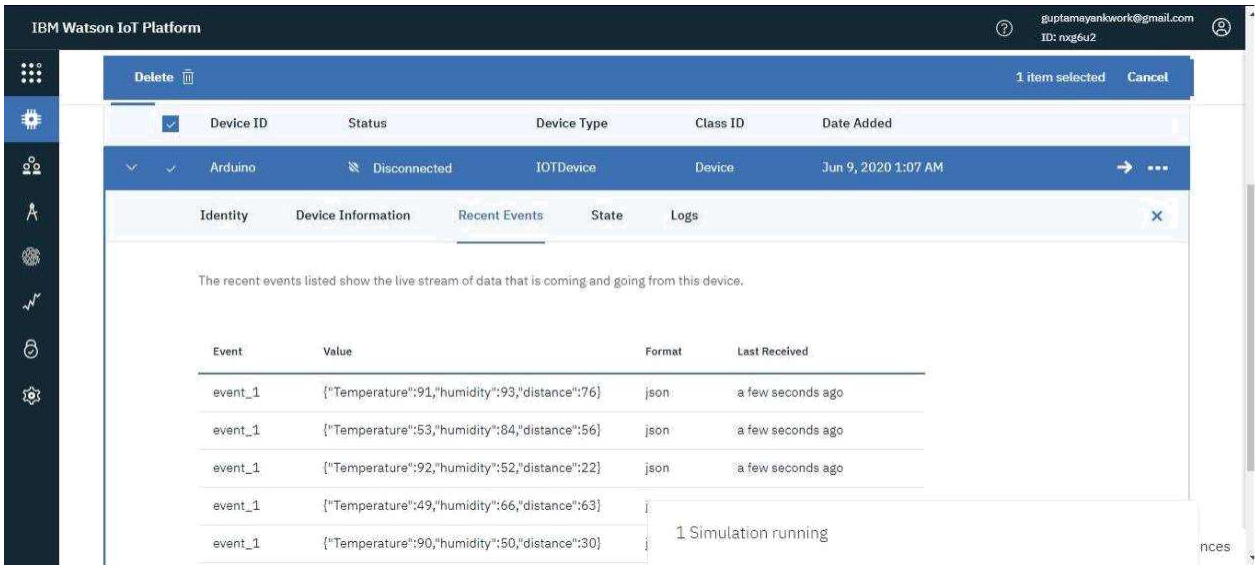
Items per page 50
1–1 of 1 item
1 Simulation running
Show all


IBM Watson IoT Platform
guptamayankwork@gmail.com
ID: nxg6u2
Delete
1 item selected
Cancel
Device ID
Status
Device Type
Class ID
Date Added
Arduino
Disconnected
IOTDevice
Device
Jun 9, 2020 1:07 AM
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 Received
event_1
{"Temperature":91,"humidity":93,"distance":76}
json
a few seconds ago
event_1
{"Temperature":53,"humidity":84,"distance":56}
json
a few seconds ago
event_1
{"Temperature":92,"humidity":52,"distance":22}
json
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event_1
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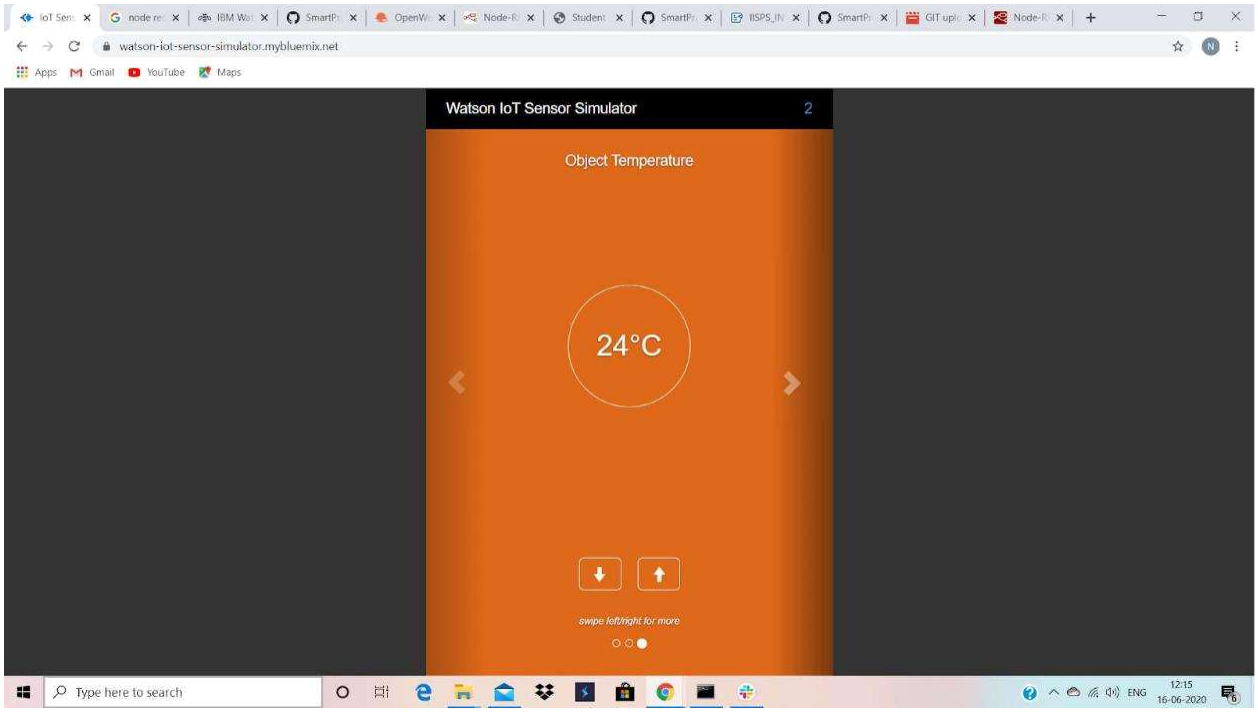
1 Simulation running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swipe left/right for more
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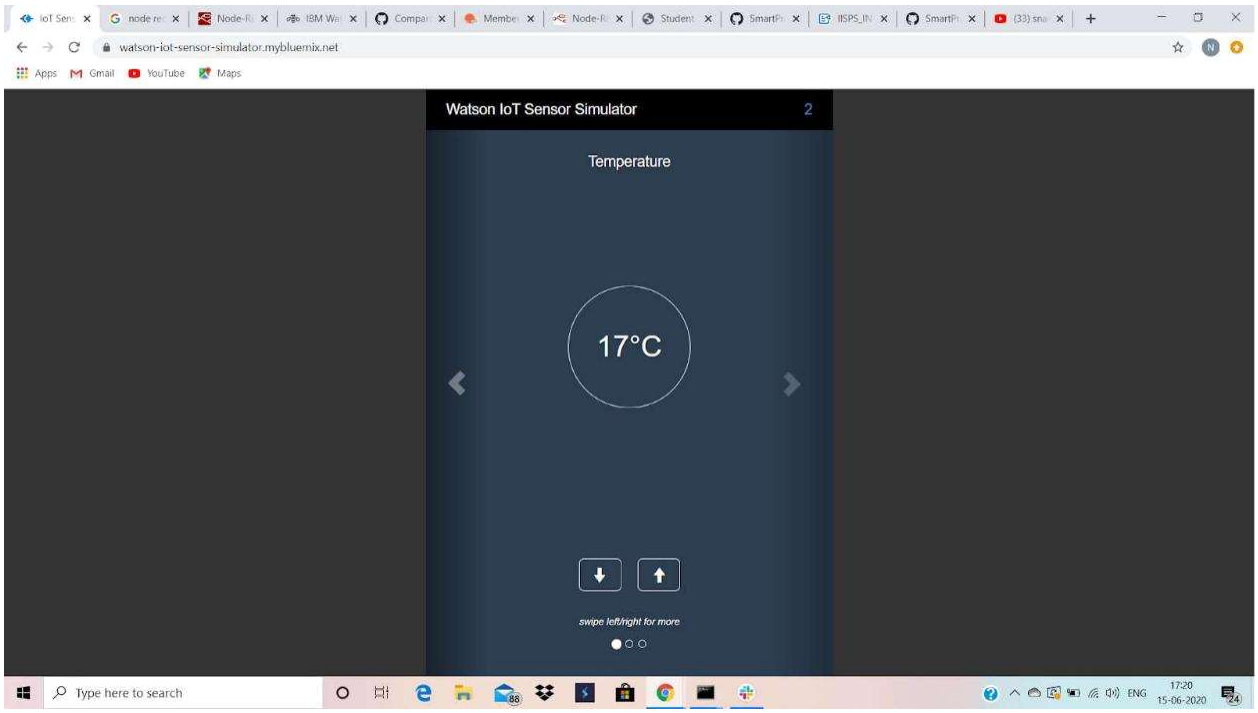
16-06-2020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Maps
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Temperature
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swipe left/right for more
Type here to search
ENG
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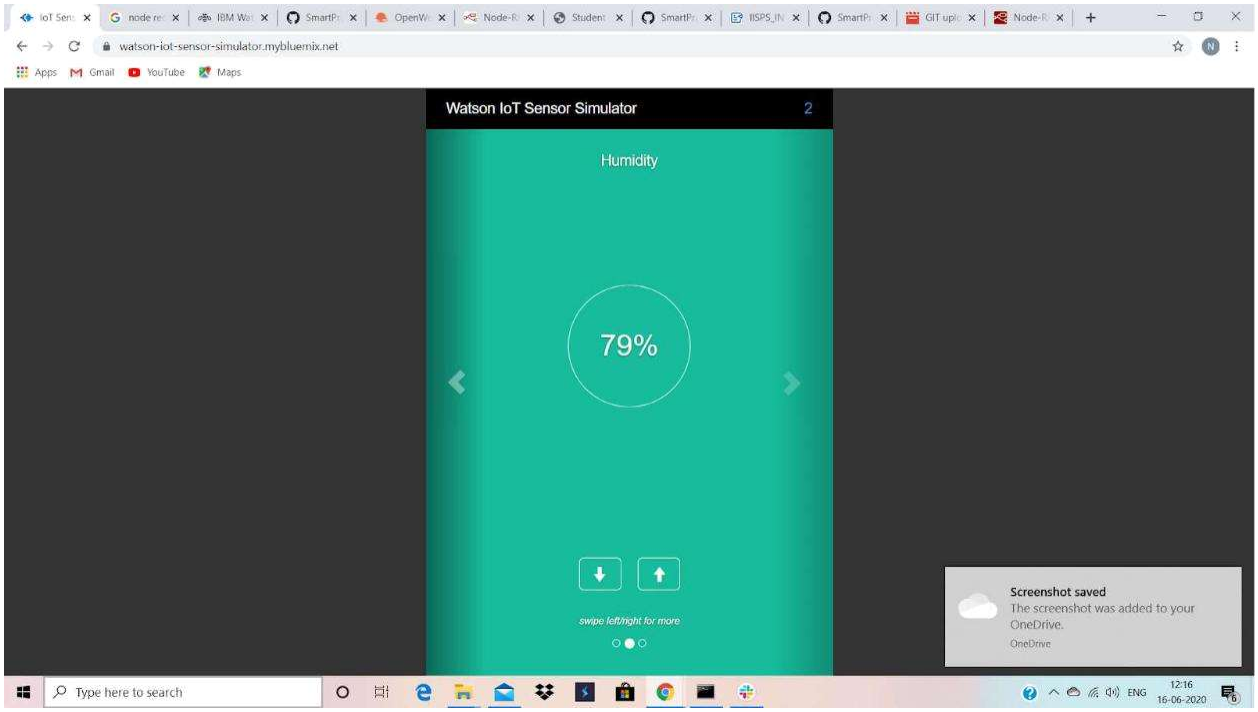
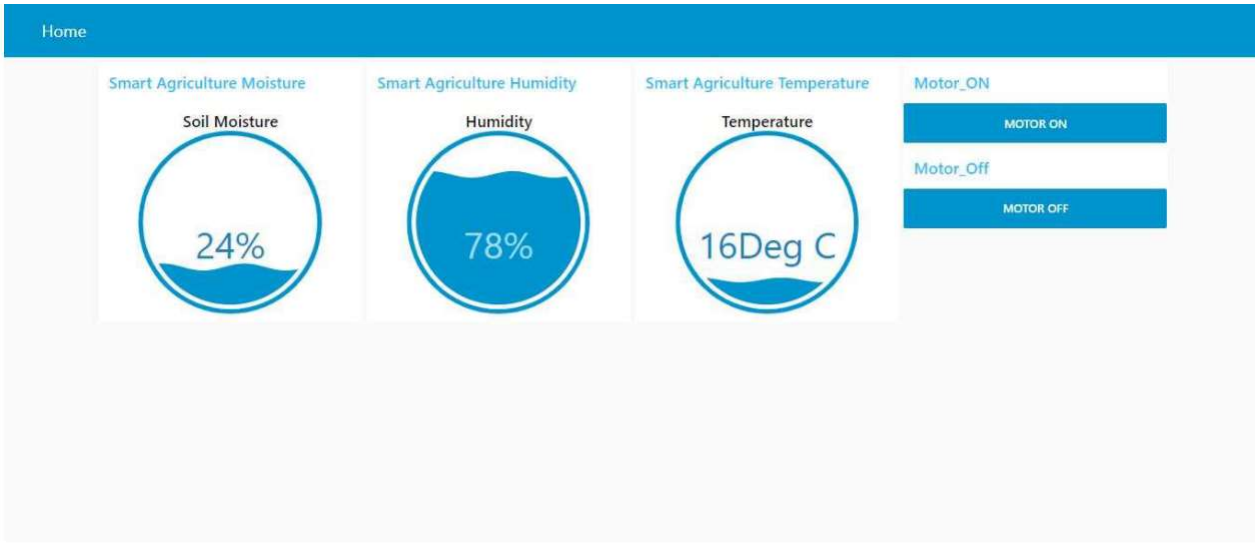
15-06-2020

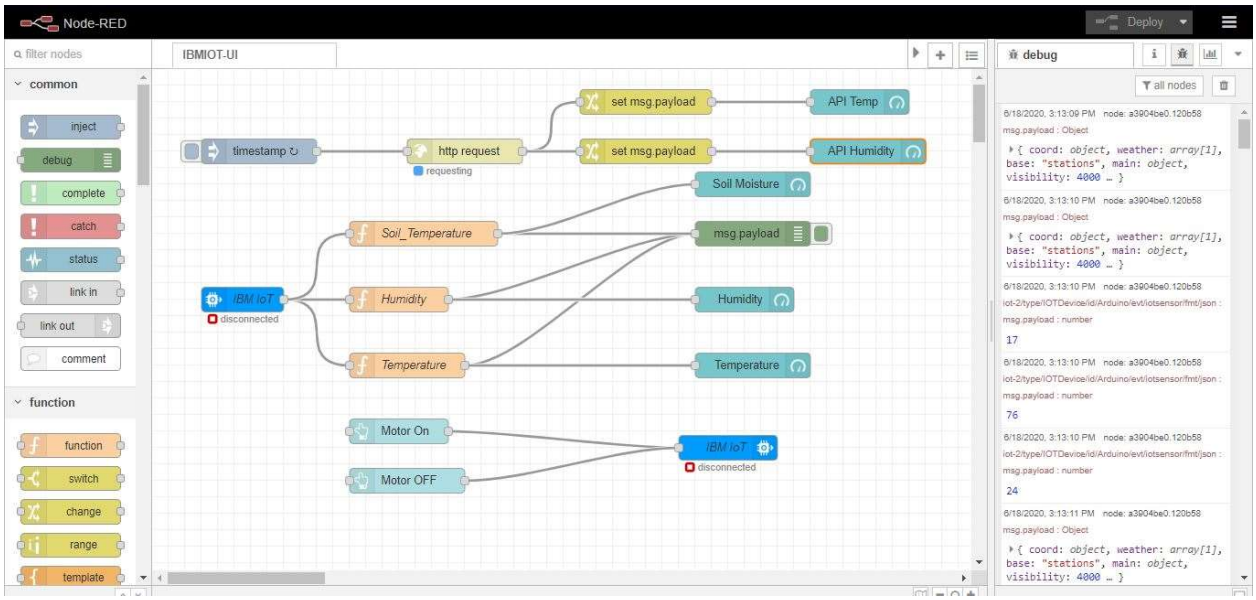




HERE WE HAVE ALL WORKING COMPONENTS SUCH AS THE IOT SENSOR.THE DEVICE WHICH CONNECTS TO THE SENSOR AND UPLOADS DATA INTO THE IBM CLOUD.THE MOTOR WHICH TAKES INPUT FROM THE WEB APP AND THEN UPLOADS INPUT VIA PYTHON CODE ON CLOUD.

THE BOTTOM CORNER OF THE IMAGE SHOWS SOME CARDS WHICH DISPLAYS THE DATA IN A VISUALLY APPEALING WAY THAN JUST NUMBERS SUCH AS LINE GRAPHS OR GAUGE WHICH MAKES IT EASY TO UNDERSTAND.

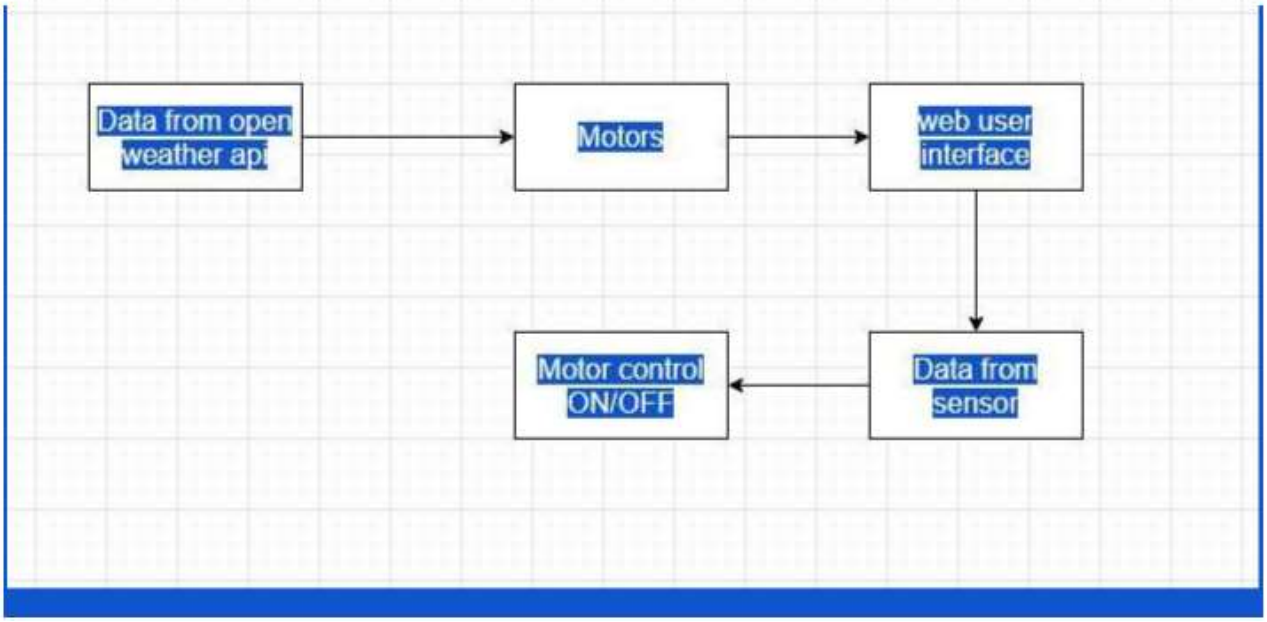
FUNCTIONING OF THE APP



IN THIS FLOW WE HAVE IBM NODES TO GET THE IOT SENSOR DATA FROM IBM CLOUD AND PUSH THE MOTOR ON/OFF COMMANDS FROM THE WEB DASHBOARD FROM THE WEB DASHBOARD BACK TO THE IBM CLOUD.

HERE WE ARE USING HTTP REQUEST WHICH I AM USING TO GET CURRENT WEATHER DATA AND DISPLAY ON THE DASHBOARD.

THEORY BLOCK DIAGRAM

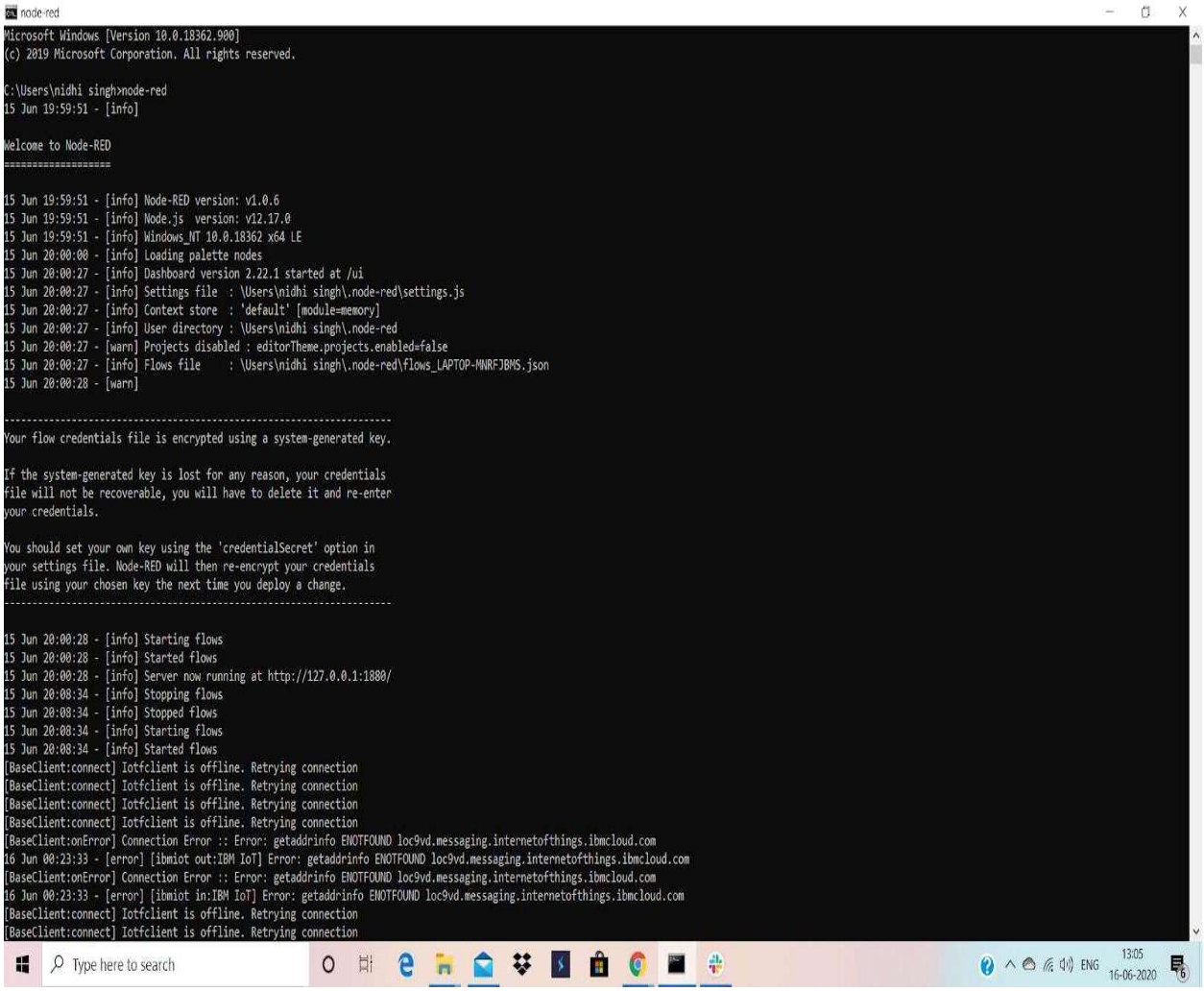


THIS BLOCK DIAGRAM IS SHOWING THEORITICAL COMPUTATION OF WHAT ARE WE BASICALLY DOING IN THIS PROJECT.

SO, HERE WE ARE BASICALLY MONITORING THE WEATHER CONDITIONS AND COLLECTING DATA FROM OPEN WEATHER API.
THE REAL TIME FIELD CONDITIONS ARE MONITORED VIA SENSOR AND THE DATA IS COLLECTED VIA SENSOR.
AND ACCORDINGLY THE MOTOR IS CONTROLLED BY ON/OFF BUTTONS.

ALL THESE DATAS ARE SEND TO THE WEB USER INTERFACE AND THE MOTOR IS CONTROLLED ACCORDINGLY.

NODE-RED ON COMMAND PROMPT



PROJECT SCHEDULE

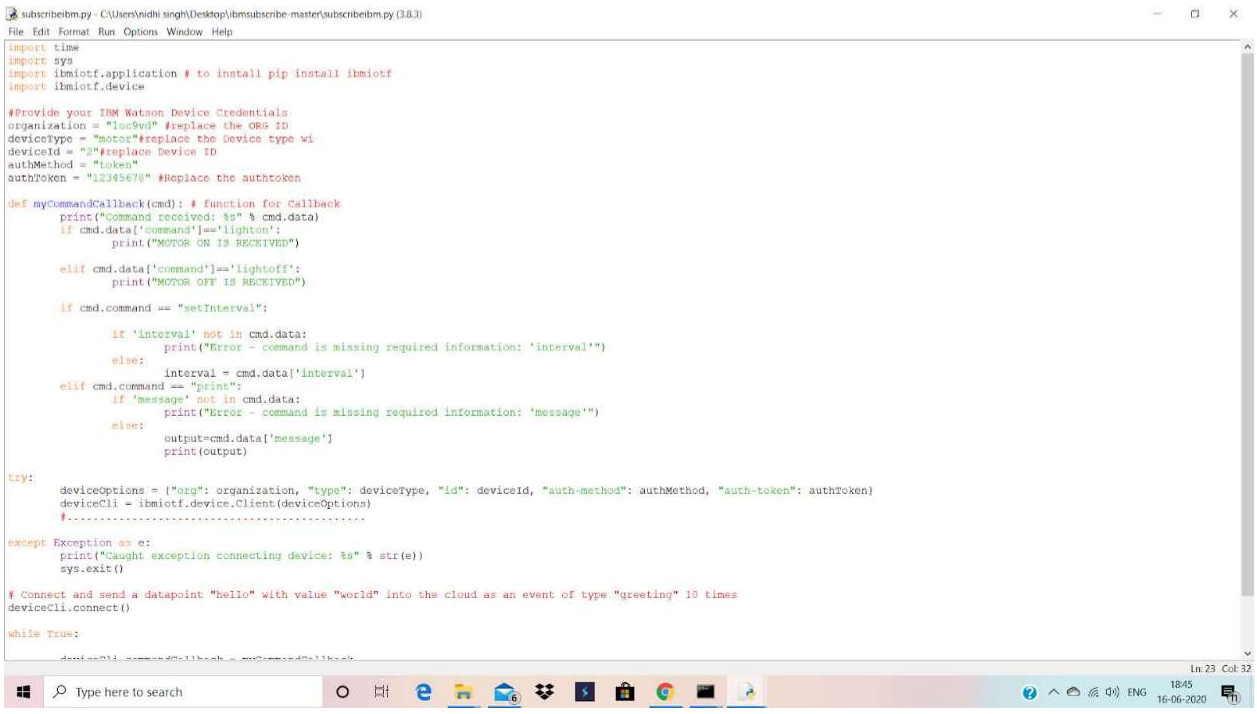
WEEK 1	WEEK 2	WEEK 3	WEEK 4
planned my project	created device in IBM cloud	started working with node-red	started to prepare reports on zoho writer
set up the development environment	installed node red locally	configured IBM iot sensor and node-red UI	pushed my files to github repository
created accounts in IBM cloud	installed the required nodes	downloaded python idle and ran the code	recorded the feedback video

PYTHON CODE

subscribeibm.py - C:\Users\mayan\Desktop\ibmsubscribe-master\subscribeibm.py (3.7.4)

File Edit Format Run Options Window Help

```
import time
import sys
import ibmiotf.application # to install pip install ibmiotf
import ibmiotf.device

#Provide your IBM Watson Device Credentials
organization = "nxg6u2" #replace the ORG ID
deviceType = "IOTDevice"#replace the Device type wi
deviceId = "Arduino"#replace Device ID
authMethod = "token"
authToken = "123456789" #Replace the authtoken

def myCommandCallback(cmd): # function for Callback
        print("Command received: %s" % cmd.data)
        if cmd.data['command']=='motoron':
                print("Motor ON IS RECEIVED")

        elif cmd.data['command']=='motoroff':
                print("Motor OFF IS RECEIVED")

        if cmd.command == "setInterval":

                if 'interval' not in cmd.data:
                        print("Error - command is missing required information: 'interval'")
                else:
                        interval = cmd.data['interval']
        elif cmd.command == "print":
                if 'message' not in cmd.data:
                        print("Error - command is missing required information: 'message'")
                else:
                        output=cmd.data['message']
                        print(output)

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()
```



WHEN THE MOTOR COMMANDS ARE GIVEN ON THE NODE-RED DASHBOARD ,WE GET SIGNAL IN THE PYTHON PROGRAM.

BIBLIOGRAPHY

1.https://cloud.ibm.com/
2.https://watson-iot-sensor-simulator.mybluemix.net/
3.https://loc9vd.internetofthings.ibmcloud.com/dashboard/devices/browse
4.http://localhost:1880/ui/#!/0?socketid=cxfzbqCJL5U8bODKAAAc

5.http://localhost:1880/#flow/23ee611b.2e0ebe
6.https://github.com/SmartPracticeschool/llSPS-INT-2244-Smart-Agriculture-system-based-on-IoT