**PROJECT REPORT ON**

**WHETHER BASED SMART SPRINKLER** . **SYSTEM**

INTRODUCTION

**1.1Overview**

The motto of this project is to build IoT based smart sprinkler system for golf courts based in the whether conditions this helps to keep the ground ready to use always with less effort as the motor operates automatically based on the weather conditions and the moisture level in the soil this can be done using a mobile application

This is designed to operate Mortor and sprinkles with the Mobile App based on the condition of the whether that is temperature and humidity. If the temperature is more and the soil looses mouisture the sprinklers will sprinkle the water and when desired soil moisture is achieved they will be turned on. All there functions can be monitored using the Mobile App which ease the maintenance of the ground.

**1.2 purpose**

The whether based smart sprinkler system for golf court is online information system with HTTP web based protocol using Phyton, IBM cloud, Nodered, MIT app inventor and aimed at provideing a common server for many users connected across the internet

scope

Smart sprinkler system based on weather conditions can monitor temperature humidity and soil moisture to maintain a perfect golf court

Here the user will be provided a model app

So even when the user is far from the ground he can monitor the ground he will get notifications if the motror gets on and off.

**2 literature survey**

**2.1 existing problems**

\* The system doesnot have option to turn sprinkler on and off automatically based on soil moisture

\* The system does not have informed about regular changes on temperure and humidity

\* The system does not send any notifications regarding temperature fluctuations

\* High watering make ground unfit to use

**2.2proposed solutions**

\* User can know the temperature and humidity value using a web application or mobile application

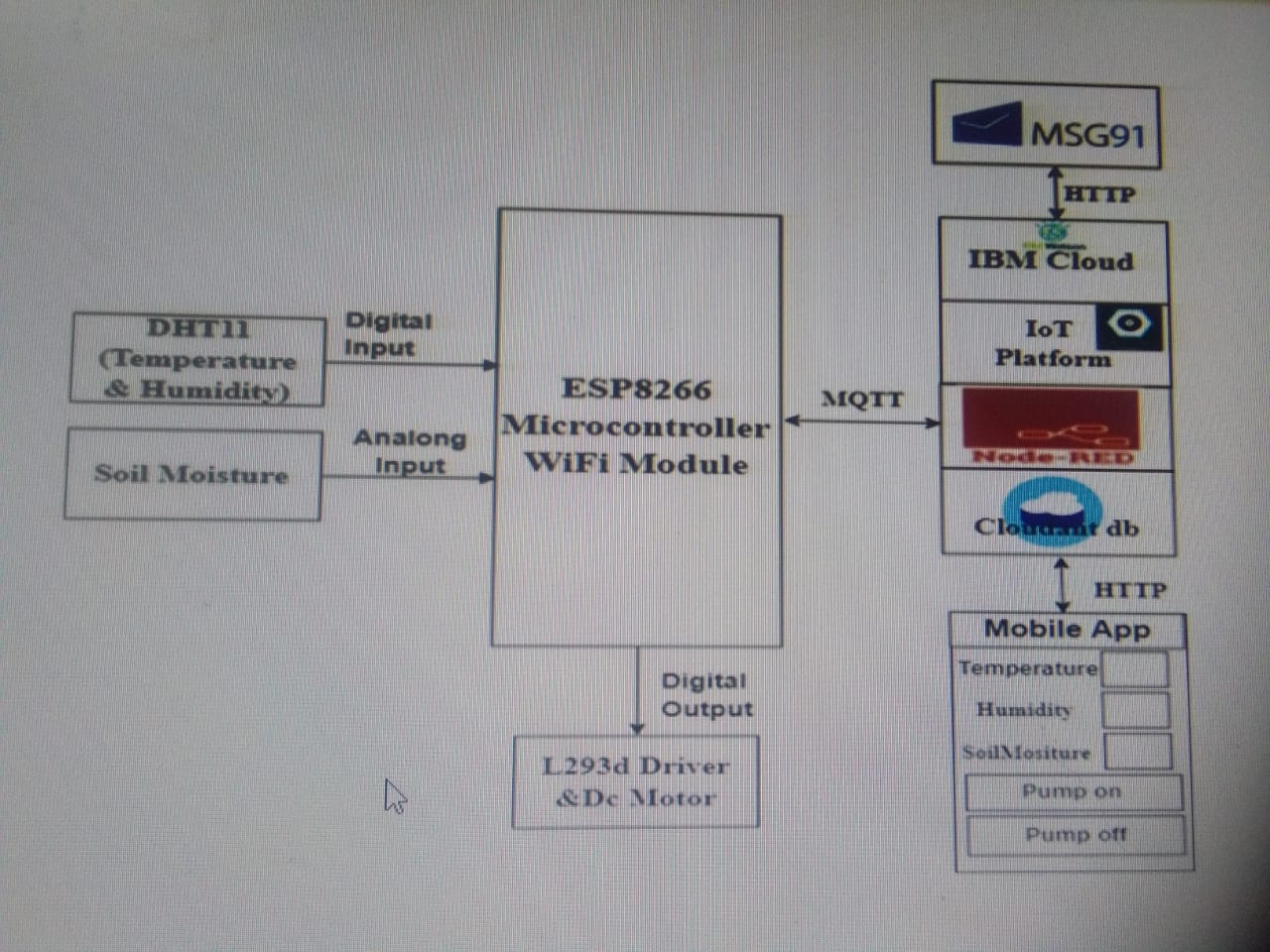
\*user can on and off the Mortor on the Mobile App or web application depending on his convince

\*If the parameters reach beyond the threshold values user will not alerted with a message

**3 Theoritical analysis**

**3.1 Block diagram**

Block diagram of the project



**3.2 Hardware and software designing**

Hard ware specification :

\*processor : AMD Ryzen 5 200U with radeon Vega mobile Gfx 2.00GHz

\*8GB RAM

\*64 bit operating system

**Software specification:**

\*Database: node-red-qcmio-cloudentent-1594306440289-79244(cloundent-db)

\*Phyton, node-red, mit-App inventor

for Designing procedure

**4.Designing Procedure**:-

1. Sign-up for IBM Academic Initiative Account through the link https://my15.digitalexperience.ibm.com/b73a5759-c6a6-4033-ab6bd9d4f9a6d65b/dxsites/151914d1-03d2-48fe-97d9-d21166848e65/academic/home Sign-in to your IBM cloud account from the linkhttps://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:

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, go tohttps://nodered.org/docs/gettingstarted/windows. (For further details on how to use Node-Red, visit https://nodered.org/docs/userguide/)

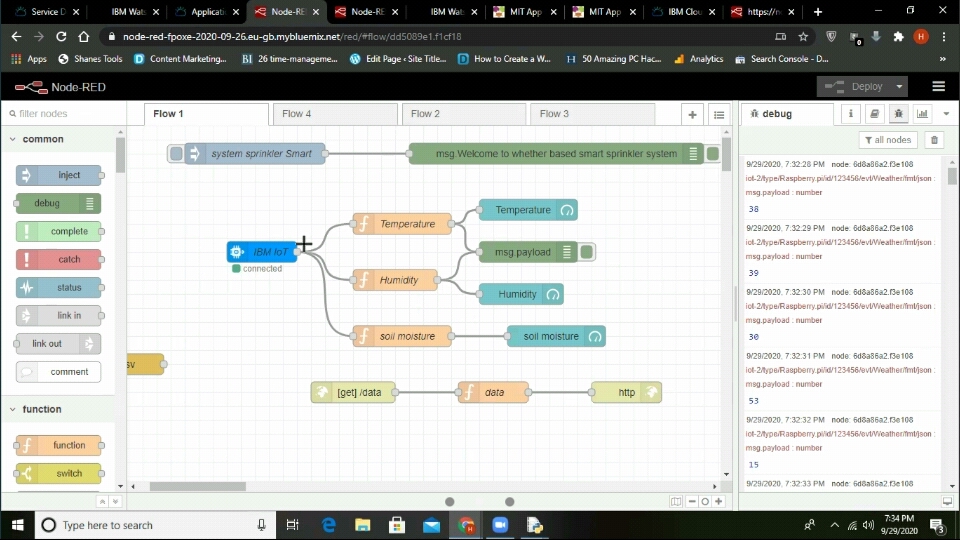
**NODE RED FLOWS**

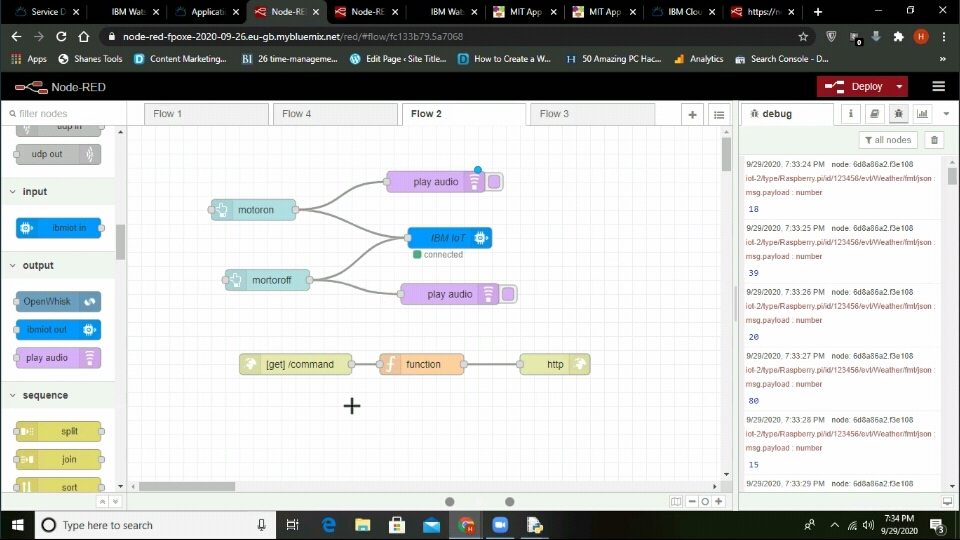
**Flows :- fig 1:**

This flow is used to give the information about motor on/off conditions

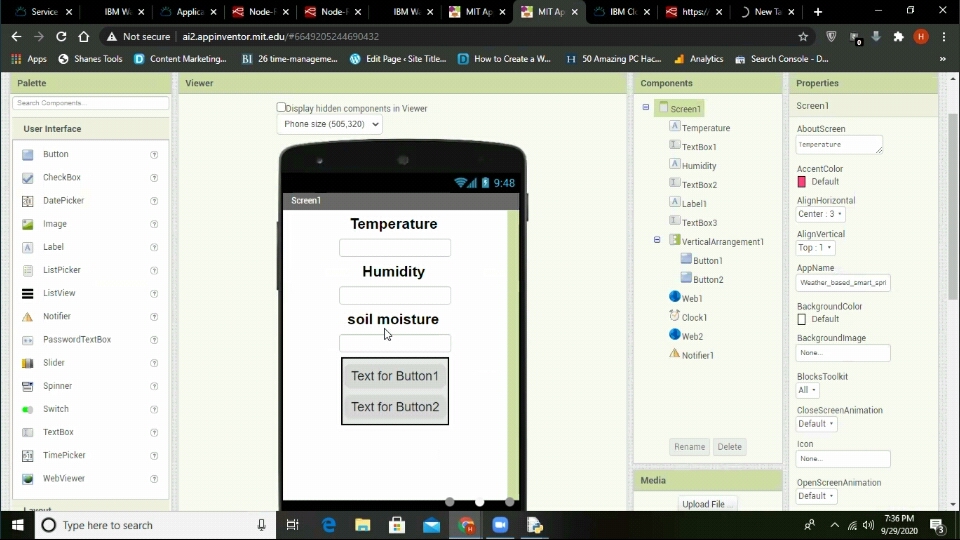
fig 2:

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

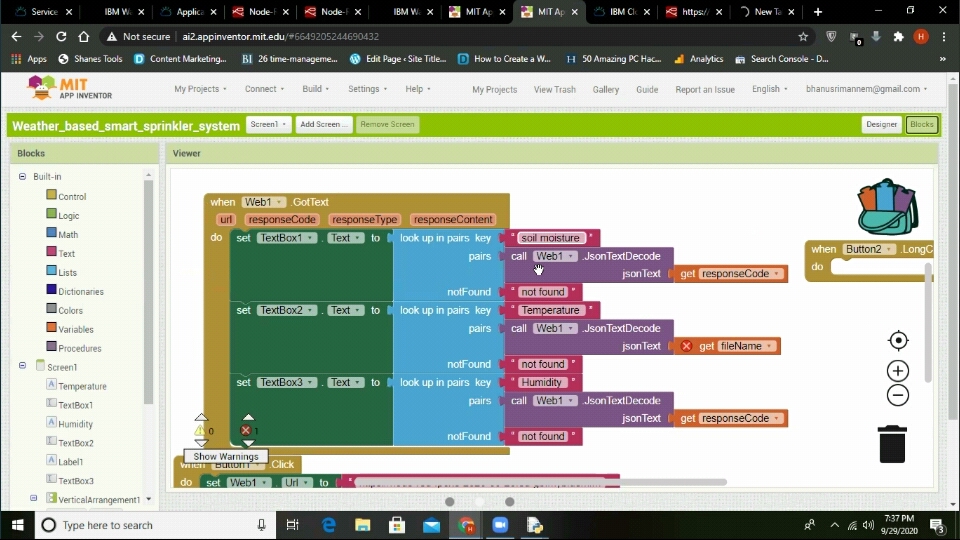




**MIT APP INVENTOR:**



⁕This is designer part of the mobile app



⁕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 = "y45n29"

deviceType = "Rasberry.pi"

deviceId = "123456"

authMethod = "token"

authToken = "12345678"

def myCommandCallback(cmd):

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

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=nO5pF9ULeKwo8Ev HfVImxDaB1XqMbdGrs20C74ZluYhA3tTJzyNze7VmUb1AYkhZySL69xa3goW84qpK&se nder\_id=FSTSMS&message=temp is above threshold values&language=english&route=p&numbers=9182519168,9912233583')

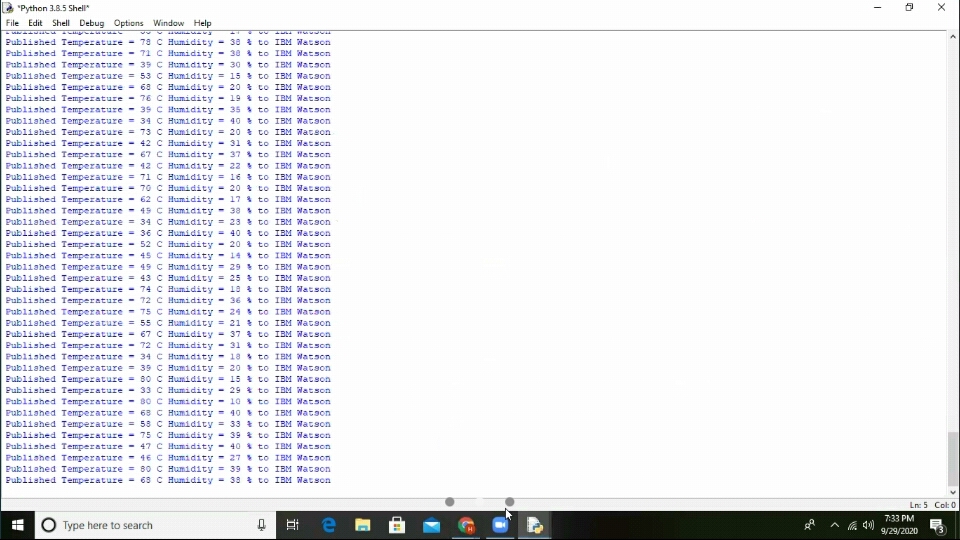
if temp>=70:

print(r.status\_code)

# Disconnect the device and application from the cloud

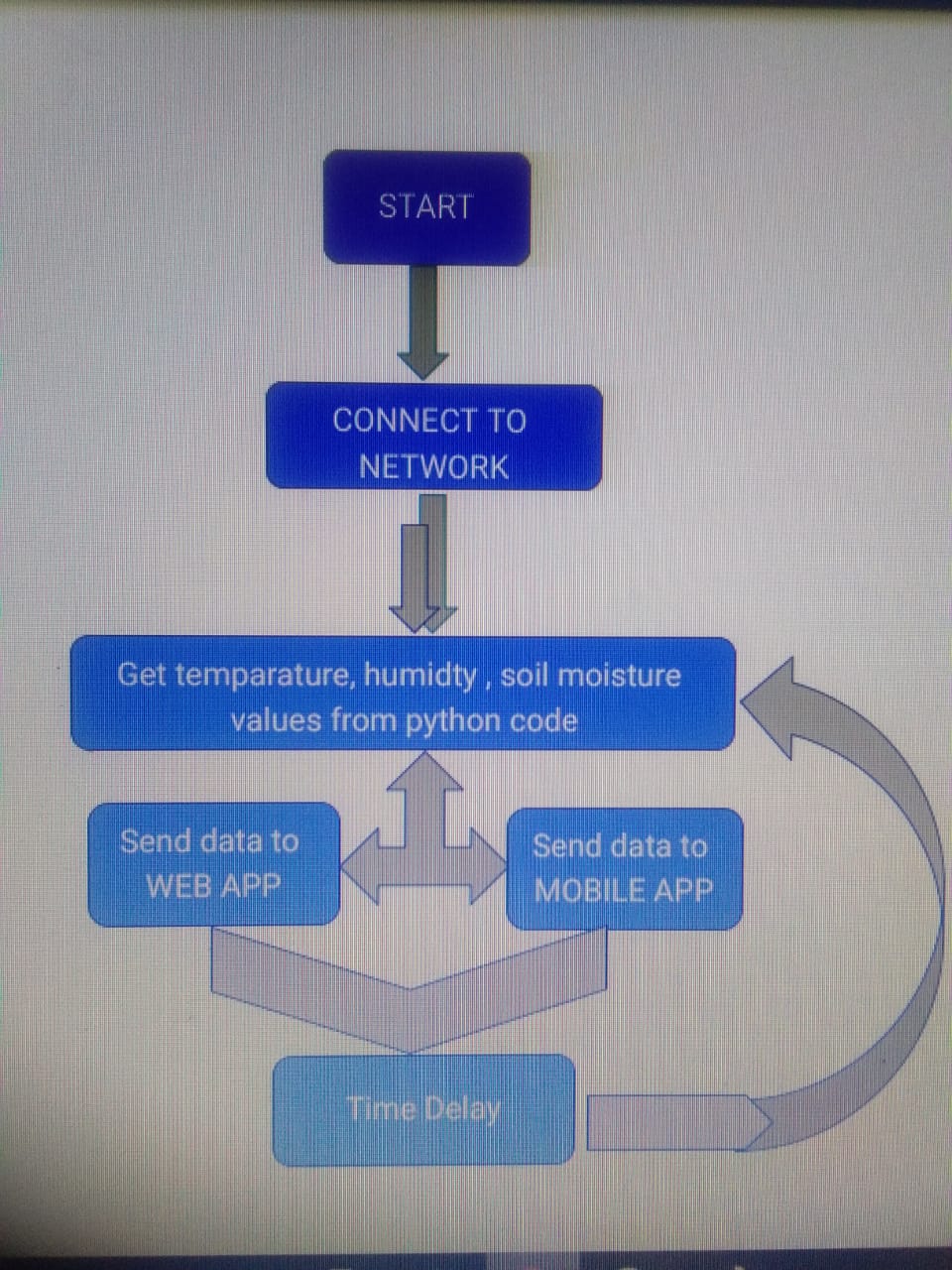
deviceCli.disconnect()

**Output of the python code :**



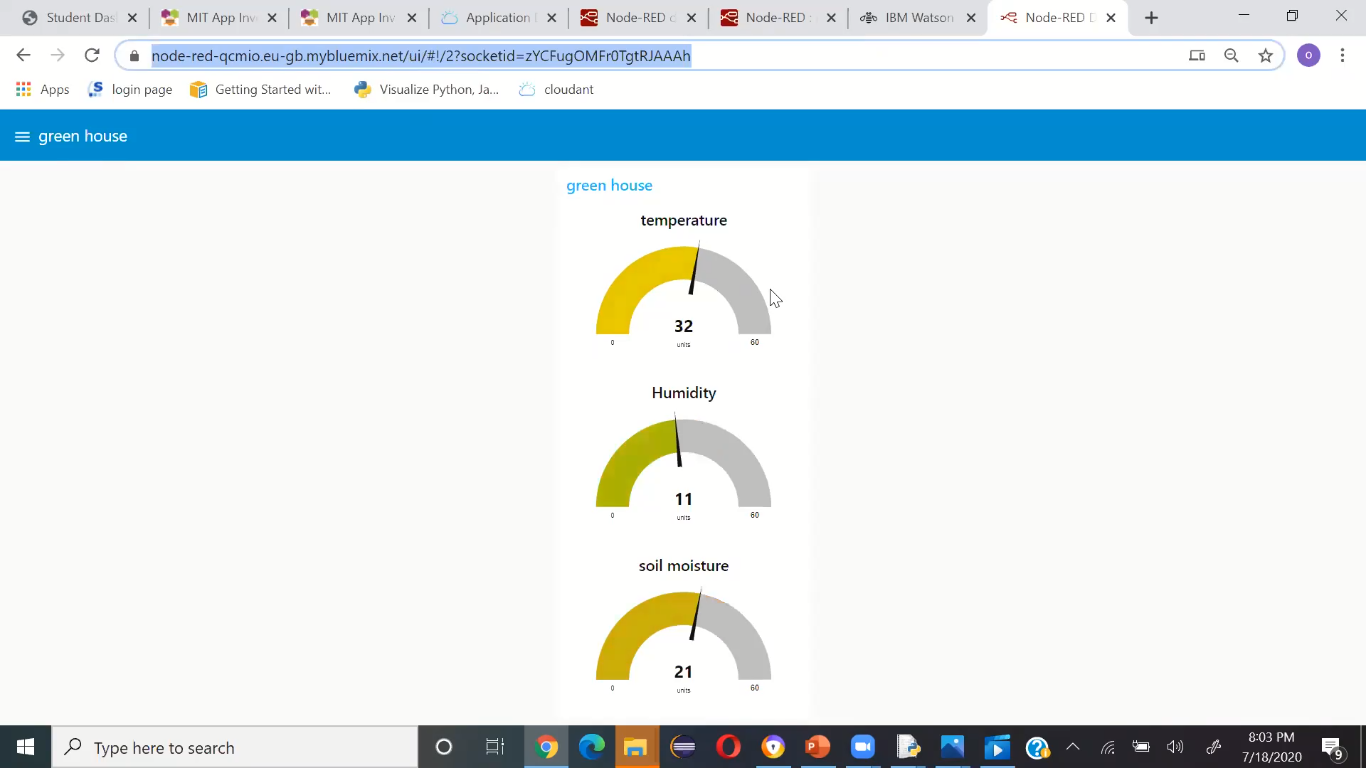
**5.FLOWCHART:**

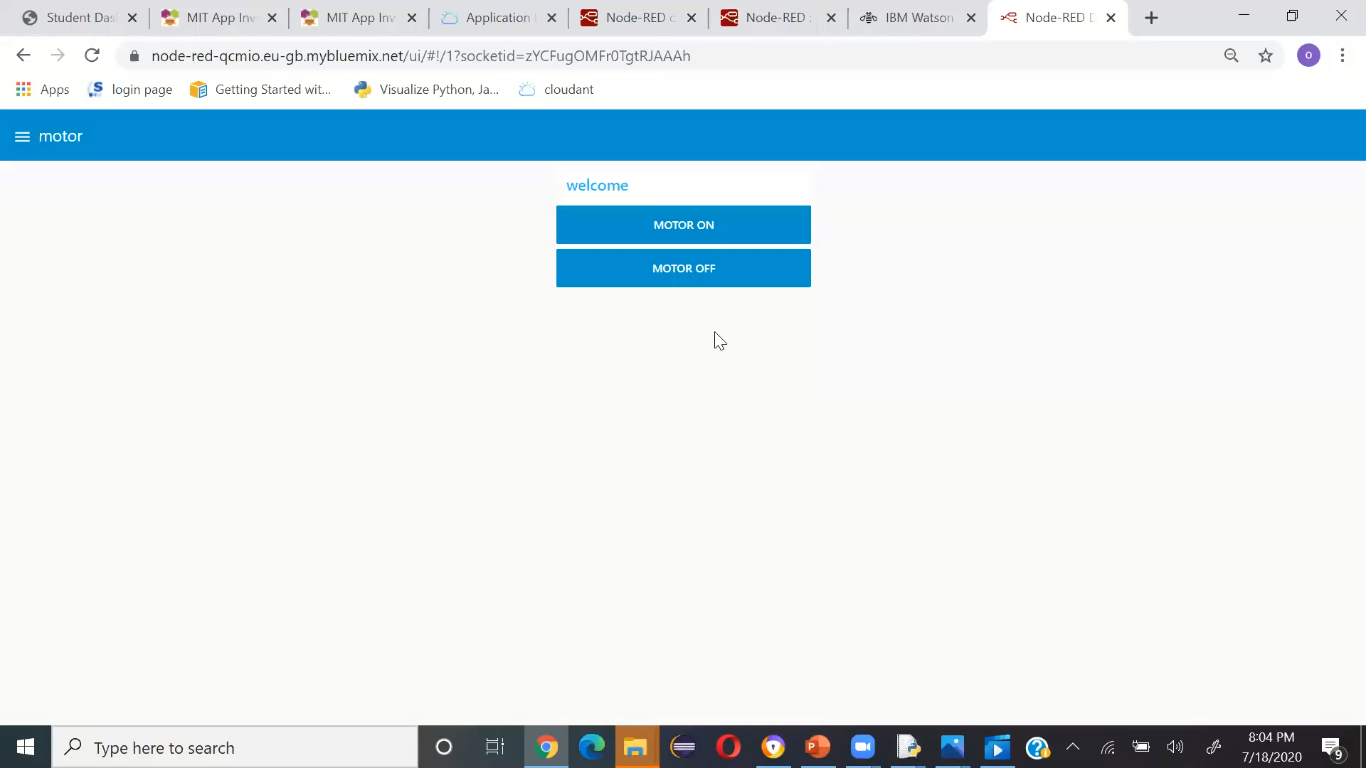
here is the flow chart describing the working of IOT based whether based smart sprinkler system



**6.RESULT:**-

Following the above designing procedure results in a web Applicaon that is used by the users to perform whether based smart sprinkler system . The web Applicaon generated by the above designing procedure is as follows:





**7.Advantages & Disadvantages:**

**Advantages:**

• High profits

• Clean ground

• Soil-free

• Less staff

• Shorter harvesting

• No ploughing

**Disadvantages:**

• Expensive

• Lots of planning needed

• Alarms needed

• Income and ability to ground need to be balanced against the cost of the system

**8.Applications:**

• Automac plant monitoring

• Water pump control

• Climate control

• Intelligent Environment Control System

**9.Conclusion:**

IoT based whether based smart sprinkler system for Live Monitoring of Temperature and Soil Moisture has been proposed using IoT sensor simulator and Cloud Computing. The IoT based whether based smart sprinkler system being proposed via this report will assist users to reduse ther effort and moritoring in the golf grounds

**10.Future Scope:**

Future work would be focused more on increasing sensors on this system to fetch more data and by also integrating GPS module in this system and geo fence to monitor who entered the ground and who left the ground.