IoT BASED SMART CROP PROTECTION SYSTEM FOR AGRICULTURE

PROJECT REPORT

Submitted By

TEAM ID PNT2022TMID45497

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in partial fulfilment for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

M.A.M COLLEGE OF ENGINEERING,
TRICHIRAPPALI,
TRICHY-CHENNAI TRUNK ROAD,SIRUGANUR,
TRICHIRAPPALI-621 105

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CHAPTER 1[iii]

INTRODUCTION

1.1 Project Overview

- The device will detect the animals and birds using the Clarifai service.
- If any animal or bird is detected the image will be captured and stored in the IBM Cloud object storage.
- It also generates an alarm and avoid animals from destroying the crop .
- The image URL will be stored in the IBM Cloudant DB service.
- The device will also monitor the soil moisture levels, temperature, and humidity values and send them to the IBM IoT Platform.
- The image will be retrieved from Object storage and displayed in the web application.
- A web application is developed to visualize the soil moisture, temperature, and humidity values Users can also control the motors through web application.

1.2 Purpose

An intelligent crop protection system helps the farmers in protecting the crop from the animals and birds which destroy the crop. This system also helps farmers to monitor the soil moisture levels in the field and also the temperature and humidity values near the field. The motors and sprinklers in the field can be controlled using the mobile application.Here to solve this situation we are proposing a solution using IOT(Internet of Things) where we use various types of sensors to monitor the entire field and using the help of the internet we tend to send the message to the farmer or the person who is responsible for solving the crisis that is currently occurring. The types of sensors we use will also give the information of the humidity level in the field, the temperature of the field, and detection of animals using their thermal radiation and also we process the information and give them in the form of graphs and images to the farmers for easy understanding.

CHAPTER 2 LITERATURE SURVEY 2.1 Existing Problem

Most of the farmers are facing many problems nowadays due to many reasons. Our problem to solve is the invasion of various species such as birds and animals that harm the crops that are being cultivated. Various types of species such as birds and animals come to the cultivation field according to the crop that is being cultivated and also according to the season of cultivation. Some wild animals enter the fieldduring night times when the field is near a forest region or when the farm cultivates some fruits and other crops that attract animals. Some animals cross the field in search of food and water and also the birds enter the field for food and they damage all the crops. When the animals enter the field they not only eat food butthey also damage the entire field by walking upon the crops and also by spoiling the food crops. The birds, byentering the field they come to eat seeds of the crops and also they tend to drag the crops and ruin the entirefield. Some birds enter the field to eat the insects and pests in the field.

2.2 REFERENCES

Shishir Bagal , Krunal Mahajan , Riya Parate , Ekta Zade , Shubham Khante (2021) have investigated the title of “Smart Crop Protection System Using IOT” . The Smart protection system defines that this project help to farmer for the protection of a farm. We have designed this project for the only secure from animals but we this project have the provision to secure from the human begins also. This can achieve by the help of IOT device that we are discuss in this paper. The SCPS work on the battery so that this project can be easily portable and also we are add solar panels and converter modules this can help the battery to charge from solar energy. The IOT device is used to indicate the farmer by a message while someone enter into the farm and we are used SD card module that helps to store a specified sound to fear the animals.

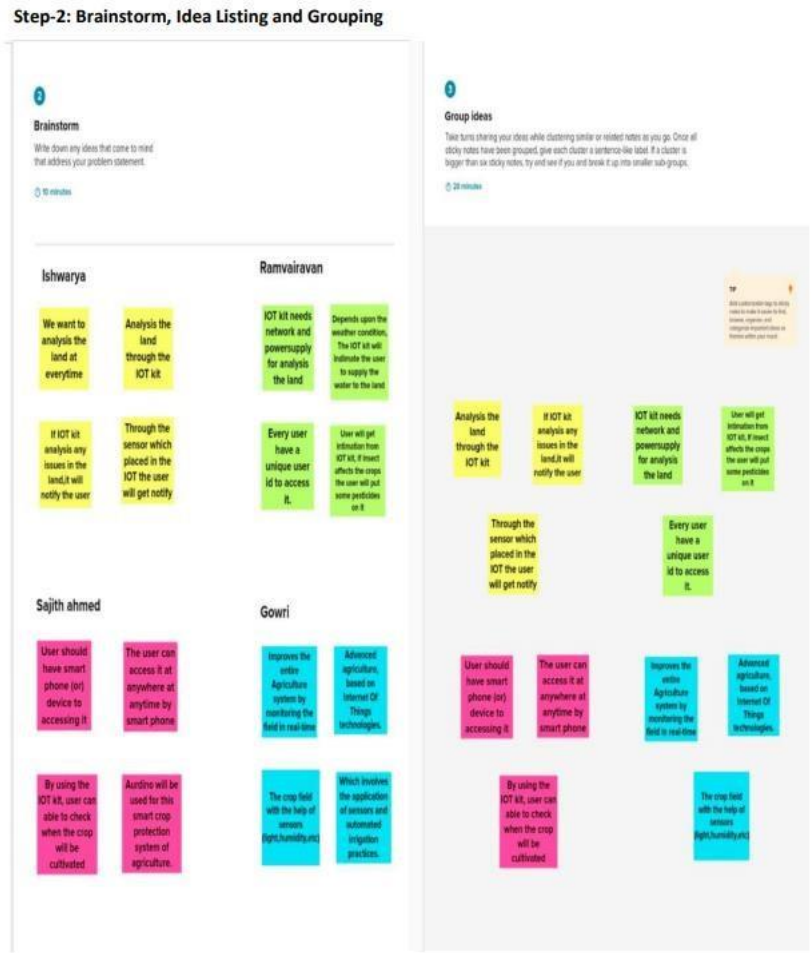
2.3 Problem Statement Definition

Most of the farmers are facing many problems nowadays due to many reasons. Our problem to solve is the invasion of various species such as birds and animals that harm the crops that are being cultivated. Various types of species such as birds and animals come to the cultivation field according to the crop that is being cultivated and also according to the season of cultivation. Some wild animals enter the fieldduring night times when the field is near a forest region or when the farm cultivates some fruits and other crops that attract animals.

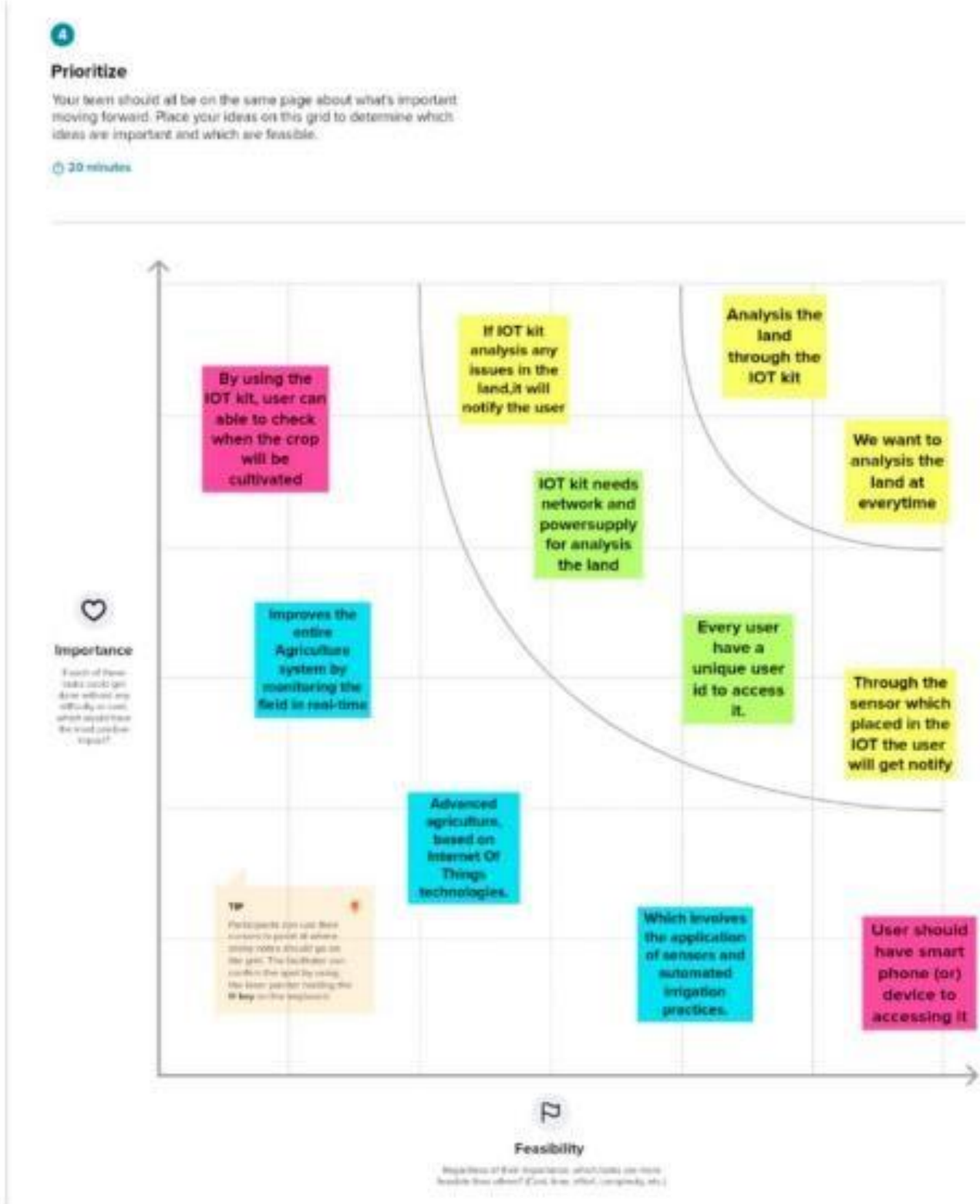
CHAPTER 3 IDEATION AND PROPOSED SOLUTION 3.1 Empathy Map Canvas

3.2 Ideation &Brainstroming

Crops in farms are many times ravaged by local animals like buffaloes, cows, goats, birds, and fire etc. This leads to huge losses for the farmers. It is not possible for farmers to barricade entire fields or stay on field 24 hours and guard it. So here we propose automatic crop protection system from animals and fire. This is aarduino Uno based system using microcontroller. This system uses a motion sensor to detect wild animals approaching near the field and smoke sensor to detect the fire. In such a case the sensor signals the microcontroller to take action.If there is a smoke, it immediately turns ON the motor. This ensures complete safety of crops from animals and from fire thus protecting the farmer's loss. This is aarduino. Uno based system using microcontroller. This system uses a motion sensor to detect wild animals approaching near the field and smoke sensor to detect the fire. In such a case the sensor.



Step-3: Idea Prioritization



3.3 Proposed Solution

Moisture sensor is interfaced with Arduino Microcontroller to measure the moisture level in soil and relay is used to turn ON and OFF the motor pump for managing the excess water level. It will be updated to authorities through IOT. Temperature sensor connected to microcontroller is used to monitor the temperature in the field. The optimum temperature required for crop cultivationis maintained using sprinklers. IOT based fertilizing methods are followed, to minimize the negative effects on growth of crops while using fertilizers.

The PIR sensor and UV sensors detect the motion of animals and birds for a particular arrange. The thermal radiation temperature of humans at different ages is fed to thesystemso there won't be any false alarm. If any invasion of animals is found, the camerafocuseson the region and the processed image is sent to the farmer . After seeing the imageof theanimal that entered, they can decide to take any actions. A fence is built aroundthefieldtoprevent large

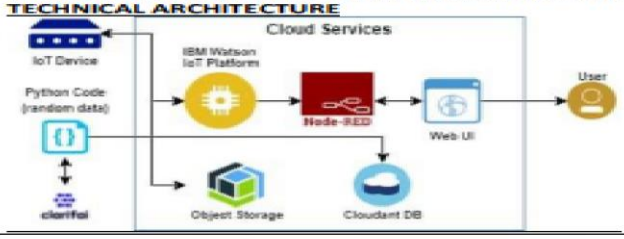
animals from entering where the sensors are placed at all the corners of thefield fully covering the entire region.

Project Design Phase-I
Proposed Solution Template

Date	29 September 2022
Team ID	PNT2022TMID45497
Project Name	Project - IoT based smart crop protection system for Agriculture
Maximum Marks	2 Marks

Proposed Solution Template:

Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Develop affordable app-based solution for Soil health monitoring and suggest which crop to be sown based on it. (Technology Bucket: IoT, AI, ML etc.)
2.	Idea / Solution description	Create app-based solution to detect soil parameters like moisture content, temperature, relative humidity, nutrient, Ph, CEC, NPK etc. and provide crop suggestions to be produced based on soil parameters & environment values.Bonus Objective: Provide remedies & alerts on soil deficiencies like Watering for low Moisture level, Fertilizers for Nutrient deficiencies **TECHNICAL ARCHITECTURE** 
3.	Novelty / Uniqueness	• Currently farmers follow Traditional Crop yielding pattern and irrespective of soil condition, farmers take routine crops. • Farmers irrespective of whether soil nutrient requirement uses blanket fertilizers for crop.
4.	Social Impact / Customer Satisfaction	Agribusiness required the devotion of numerous regular asset including, land, water, and ecological condition, The quality and amount of characteristic asset has debased throughout the years because of monetary

3.4 PROBLEM-SOLUTION FIT

Project Title: IoT Based Smart Crop Protection System for Agriculture | Project Design Phase-I-Solution Fit | Team ID - PNT2022TMID45497

Define CS, fit into CC

1.CUSTOMER SEGMENTS CS
Who is your customer?
i.e., the customers are farmers

Customer are consuming who are all ready to buy their needs.

5.AVAILABLE SOLUTIONS AS
Which solutions are available to the customers when they face the problem?
i.e., they should know the climate change and soil strength

If they knew the soil erosion of climate change, they can solve by using different kind of seeds on their land based on the climate

8.CHANNELS OF BEHAVIOUR BH
8.1 ONLINE
What kind of actions do customers take online?

The kind of action in online has some connection issues to the IOT kit and device.

8.2 OFFLINE
What kind of actions do customers take offline?

The kind of action in online is to get yield of crop and profit.

Explore AS, differentiate

Focus on J&P, tap into BE, understand

2.JOBS TO BE DONE/PROBLEMS J&P
Which jobs to be done (problems) do you address for your customers?
i.e., there could be more crop are affected

customer recommended to put pesticide on their crops before it gets affected.

6.CUSTOMER CONSTRAINTS CC
Which constraints prevent your customer from taking action or limit of solutions?
i.e., lack of knowledge in agriculture

The customer needs a proper internet connection and IoT kit.

9.PROBLEM ROOT CAUSE RC
What is the real reason that this problem exists?
i.e., customer know to use the techniques for production

The root cause is to overcrowding in agriculture and poor techniques of production, by this every problem will be solved.

Focus on J&P, tap into BE, understand

Identity strong TR & EM

3.TRIGGERS TR
What triggers customers to act?
i.e., experiencing the issues on land

There are many ways to refer to modern agriculture

4.EMOTIONS: BEFORE/AFTER EM
How do customers feel when they feel a problem?
i.e., loss of money and mentally insecure

Sometimes the IoT devices may not work properly due to some technical issues.

7.BEHAVIOUR BE
What does your customer do to address the problem and get the job done?
i.e., find the disease, analyse the land

Cone with climate change, soil erosion and biodiversity loss. Meet demand for moon food of higher quality

10.YOUR SOLUTION SL
If you are working on the agriculture land Using IoT sensor, gather the relevant details

Agriculture irrigation control stays unique of the determined significant interests in agriculture. The simulation result describes the aqua utilization according to the field parameters in the cultivation field. Guideline of horticultural water system stays restrictive to the set up significant interests of farming

Identity strong TR & EM

CHAPTER 4

REQUIREMENT ANALYSIS

4.1Functional Requirement

Following are the functional requirements of the proposed solution.

- User Registration ,Registration through Form Registration through Gmail Registration through LinkedIN
- User Confirmation ,Confirmation via Email Confirmation via OTP
- Tracking Expense Helpful insights about money management
- Alert Message Give alert mail if the amount exceeds the budget limit Category This application shall allow users to add categories of their expenses

4.2Non Functional requirement

Following are the non-functional requirements of the proposed solution.

- Usability You will able to allocate money to different priorities and also help you to cut down on unnecessary spending
- Security More security of the customer data and bank account details.
- Reliability Used to manage his/her expense so that the user is the path of financial stability. It is categorized by week, month, and year and also helps to see more expenses made. Helps to define their own categories.
- NFR-4 Performance The types of expense are categories along with an option .Throughput of the system is increased due to light weight database support.
- NFR-5 Availability Able to track business expense and monitor important for maintaining healthy cash flow. NFR-6 Scalability The ability to appropriately handle increasing demands.

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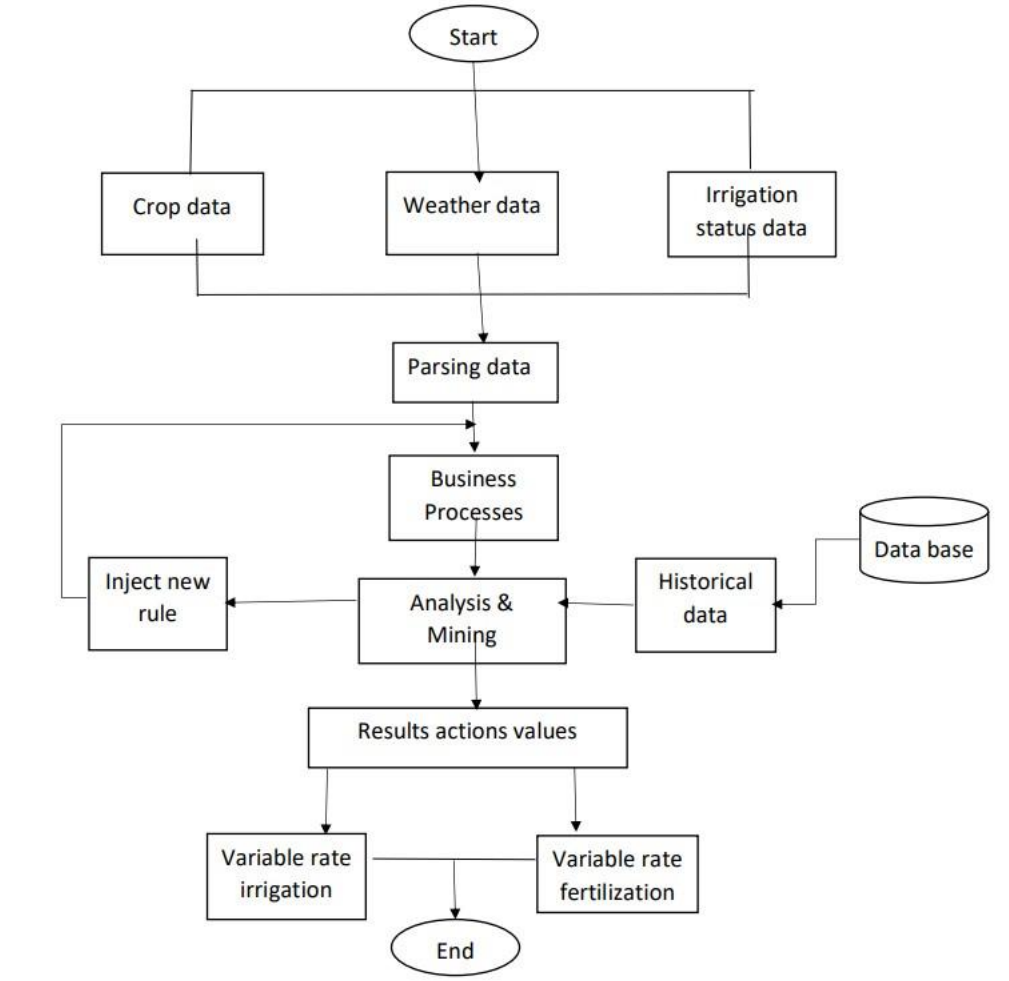
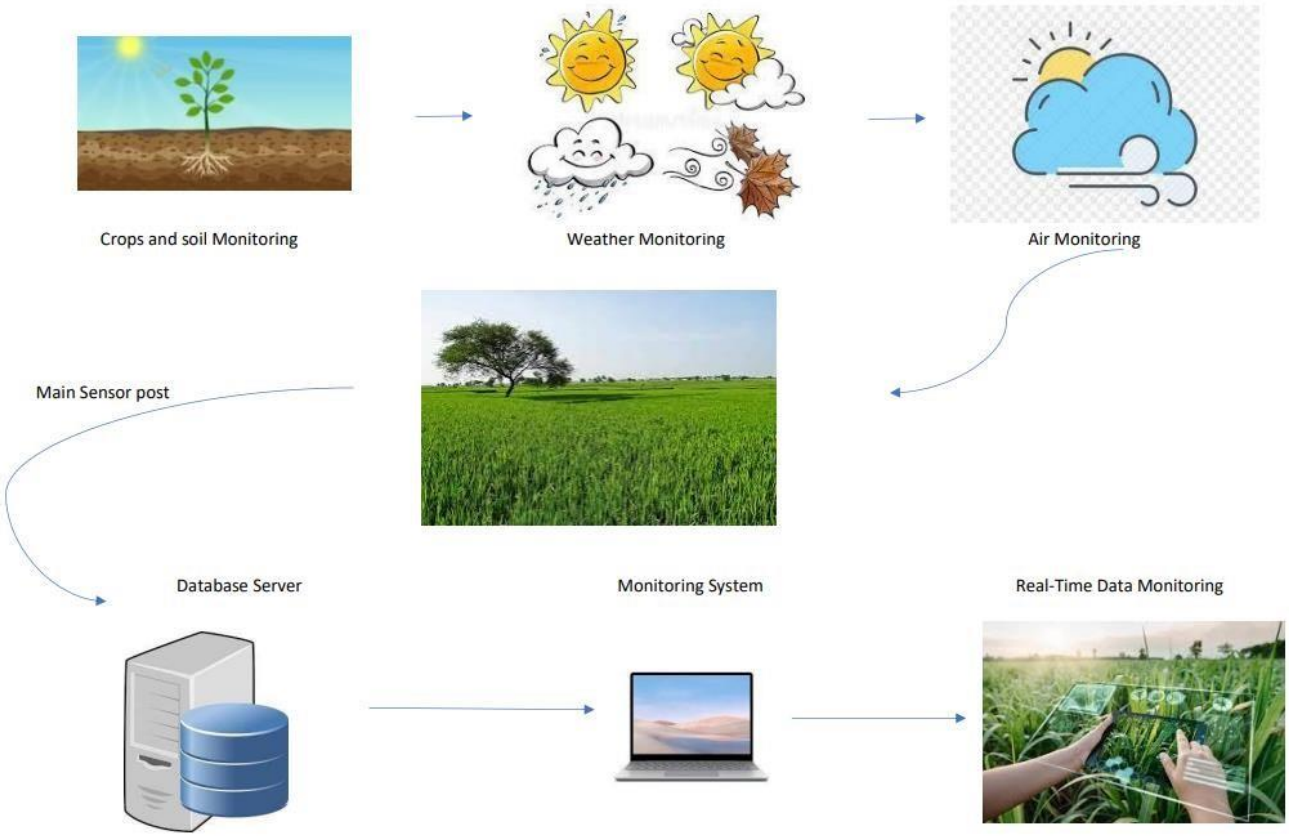
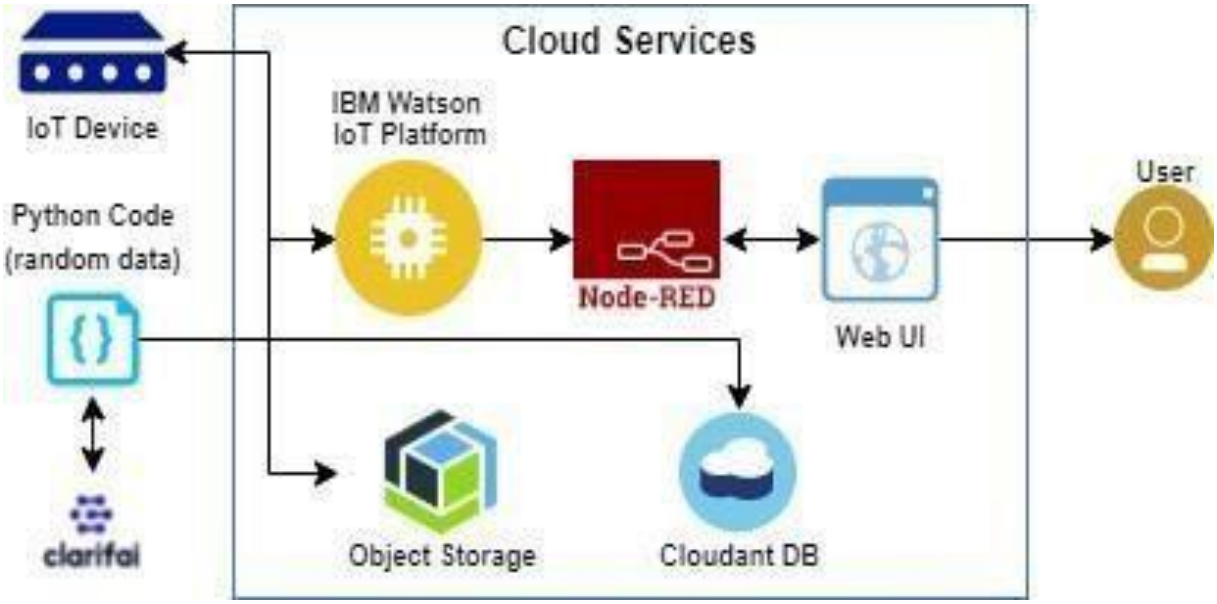
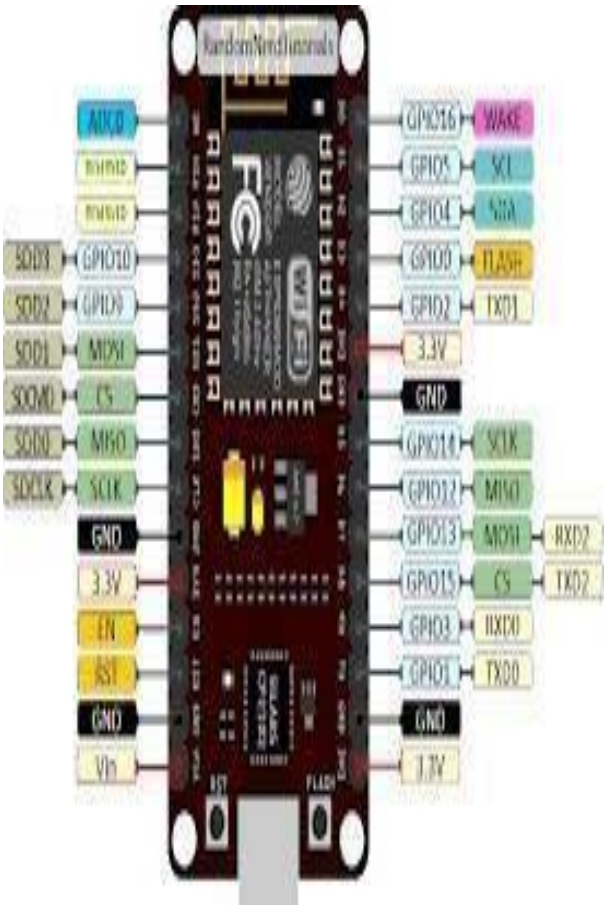
CHAPTER 5 PROJECT DESIGN 5.1 DATA FLOW DIAGRAM



5.2 Technical Architecture






RandomNerdTutorials
ADC0
GPIO16
WAKE
GPIO5
SCL
GPIO4
SDA
SDD3
GPIO10
GPIO0
FLASH
SDD2
GPIO9
GPIO2
TXD1
SDD1
MOSI
3.3V
SDD0
CS
GND
SDD0
MISO
GPIO14
SCLK
SDCLK
SCLK
GPIO12
MISO
GND
GPIO13
MOSI
RXD2
3.3V
GPIO15
CS
TXD2
EN
GPIO3
RXD0
RST
GPIO1
TXD0
GND
GND
Vin
3.3V


BM Watson IoT

5.3 USER-STORIES

User Stories

Use the below template to list all the user stories for the product.

User Type	Functional Requirement (Epic)	User Story Number	User Story/Task	Acceptance criteria	Priority	Release
Employee dashboard	Registration	USN-1	As an employee, I can register for the application by entering my email, password, and confirming my password	I can access my account/dashboard	High	Sprint-1
	Login	USN-2	As an employee, I can login to the application by entering correct email	I can access my account/dashboard	High	Sprint-2
o	Dashboard	USN-3	As an employee, according to my role, I will get notification about my task	I get the information about what I have to do in monsoons	High	Sprint-1
	Forget password	USN-4	As an employee, I can reset my password by this option in case I forgot my old password	I get access to my account again	Medium	Sprint-2
	Know more	USN-5	As a employee, I will be guided by expertise through online session once in a week about how to take care of the plant and all	Know something more	Low	Sprint-3
	Help me	USN-6	As an employee, I can post my problems and will get solution from Expertise	I can ask my query and all	High	Sprint-1
	Feedback	USN-7	As a user, if I faced any problem while using the app or want to give some suggestion about the app. That I can do by posting my issues in feedback	I can teel my problems	Medium	Sprint-2

CHAPTER 6 PROJECT PLANNING & SCHEDULING

6.1Sprint Planning & Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint1	SensorData (python script)	USN-1	The Data of sensor which are feed to the Raspberrypi.Here we areusingpython script to generatea random sensor data.	3	High	Jeya Surya (Teamleader)
Sprint1	Automation (python script)	USN-2	Some activities are made toautomation to overcome insufficientoflabour force in the field. Hence that also included in python script to implement automation .	5	High	Vigneshwaran (Team Member)
Sprint2	IBM IOT platform	USN-3	To sendtheraspberrypi data to IOT platform, we create an IBMIOT platform and connect the raspberry pi tothedevice created in IBM IOT.	5	High	Logamagesh (Team Member)

Sprint3	Node RED service	USN-4	To access the IBM IOT platform from external applicationor from externalUINode red service is established.	5	High	Vigneshwaran (Team Member)
Sprint3	API Key	USN-5	Toprotect the IBM IOT platform creating an API Key.		High	Damodharan (Team Member)
Sprint4	User Application	USN-6	Tomonitor and control the field sensors the User is provided with an User application created by MIT app inventor	8	High	Jeya Surya (Team Leader) Logamagesh (Team Member)

6.2 SPRINT DELIVERY SCHEDULE

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	8	6 Days	24 Oct 2022	29 Oct 2022	8	29 Oct 2022
Sprint-2	5	6 Days	31 Oct 2022	05 Nov 2022	5	05 Nov 2022
Sprint-3	8	6 Days	07 Nov 2022	12 Nov 2022	8	12 Nov 2022
Sprint-4	8	6 Days	14 Nov 2022	19 Nov 2022	8	19 Nov 2022

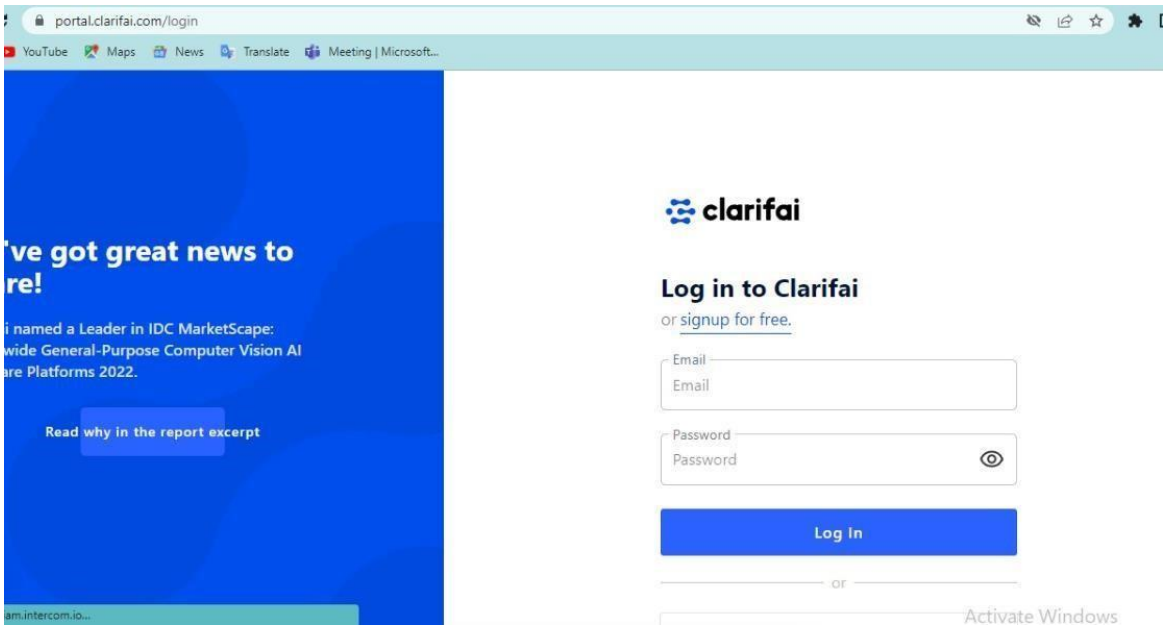
6.3 REPORT FROM JIRA REQUIRED SOFTWARE

- **CLARIFAI**
- **IBMWATSONIOTPLATFORM**
- **PYTHONIDLE**
- **NODERED**
- **MITAPPINVENTOR CLARIFAI:**

Clarifai provides an end-to-end platform with the easiest to use UI and API in the market. Clarifai Inc. is an artificial intelligence (AI) company that specializes in computer vision and uses machine learning and deep neural networks to identify and analyse images and videos. The company offers its solution via API, mobile SDK, and on-premise solutions.

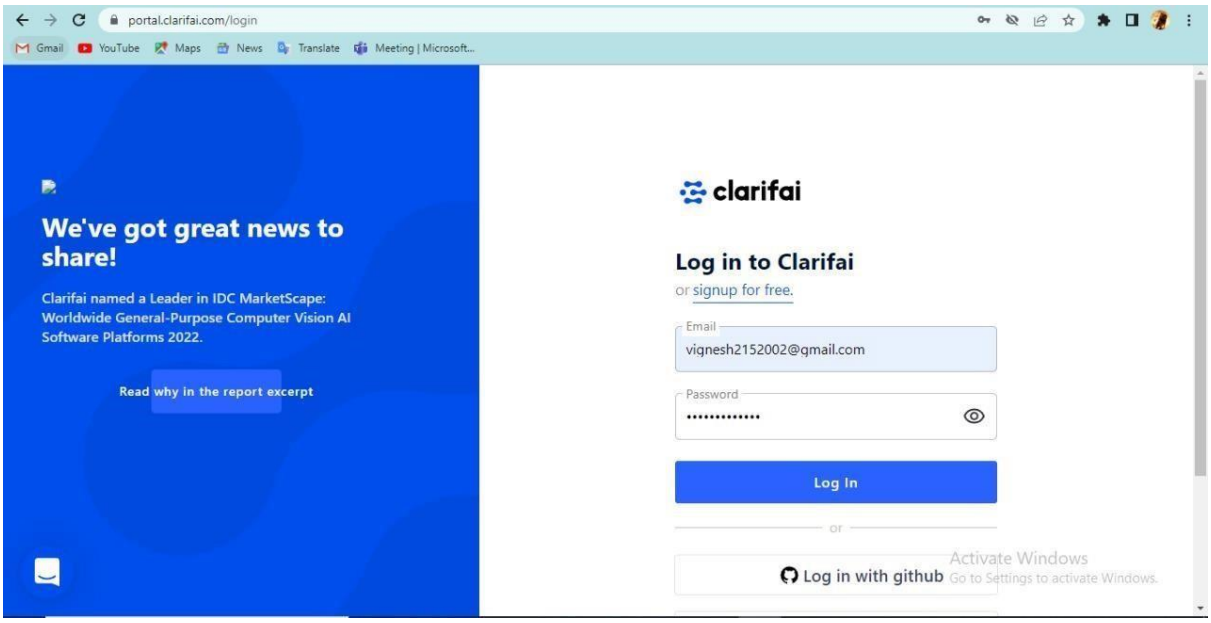
STEP 1:

- Open Clarifai portal in web browser.



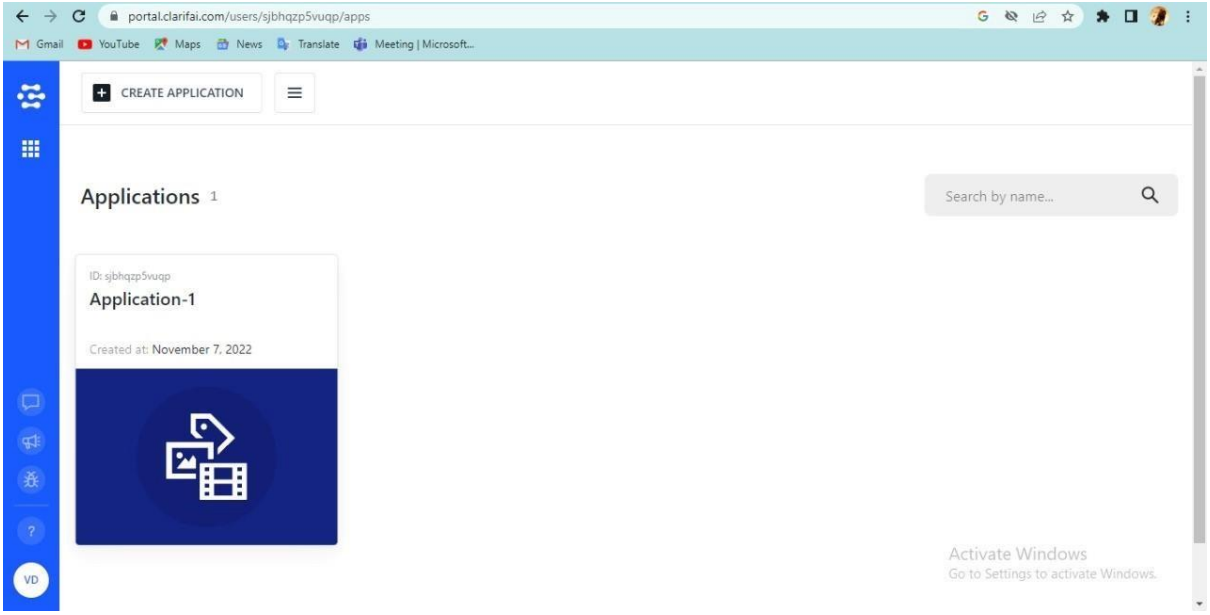
STEP 2:

- Signup using the required user mail and password.



STEP 3:

- Finally, Created an account



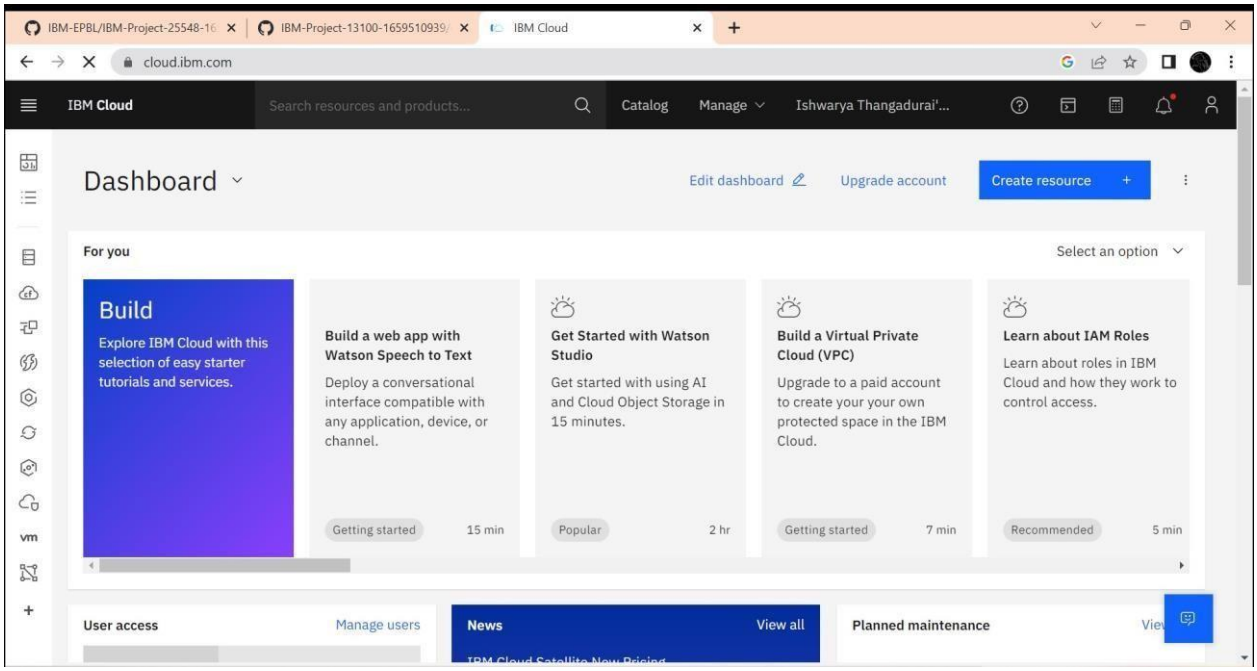
IBM WATSON IoT PLATFORM:

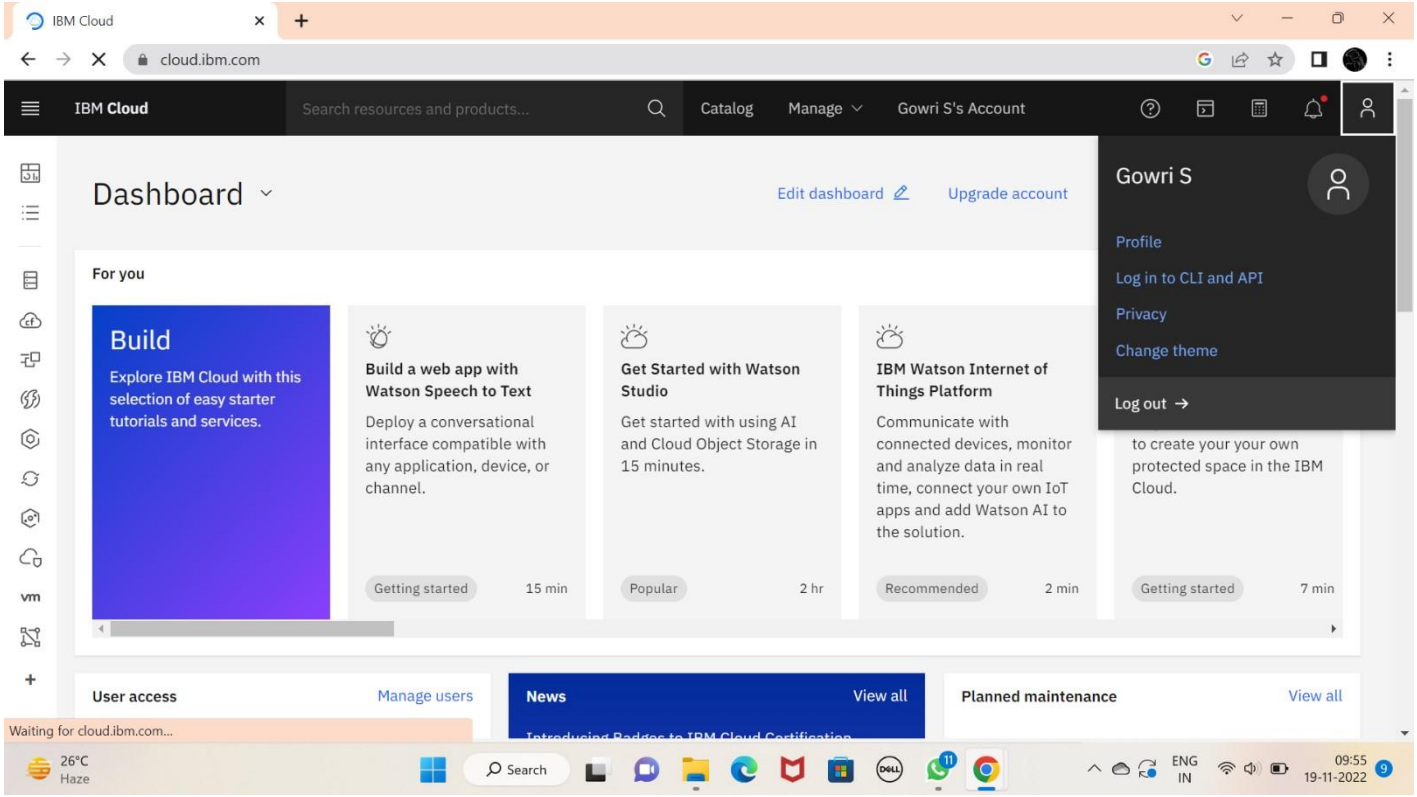
We need to have basic knowledge of the following cloud services:

- IBM Watson IoT Platform
- Node-RED Service
- Cloudant DB

We need to create an IBM Cloud Account to complete this project.

LOGIN:




IBM Cloud
cloud.ibm.com
IBM Cloud
Search resources and products...
Catalog
Manage
Gowri S's Account
Dashboard
Edit dashboard
Upgrade account
Gowri S
Profile
Log in to CLI and API
Privacy
Change theme
Log out
For you
Build
Explore IBM Cloud with this selection of easy starter tutorials and services.
Build a web app with Watson Speech to Text
Deploy a conversational interface compatible with any application, device, or channel.
Getting started
15 min
Get Started with Watson Studio
Get started with using AI and Cloud Object Storage in 15 minutes.
Popular
2 hr
IBM Watson Internet of Things Platform
Communicate with connected devices, monitor and analyze data in real time, connect your own IoT apps and add Watson AI to the solution.
Recommended
2 min
to create your your own protected space in the IBM Cloud.
Getting started
7 min
User access
Manage users
News
View all
Planned maintenance
View all
Waiting for cloud.ibm.com...
26°C
Haze
Search
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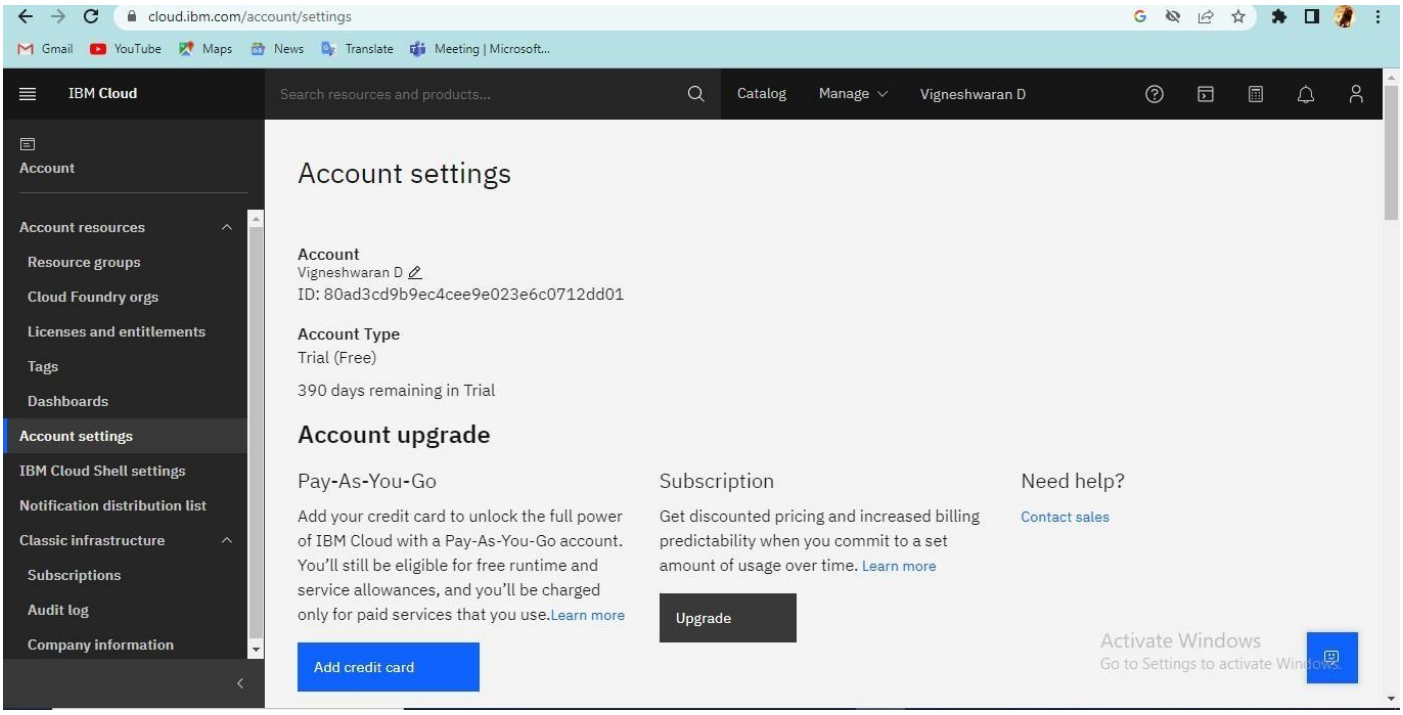
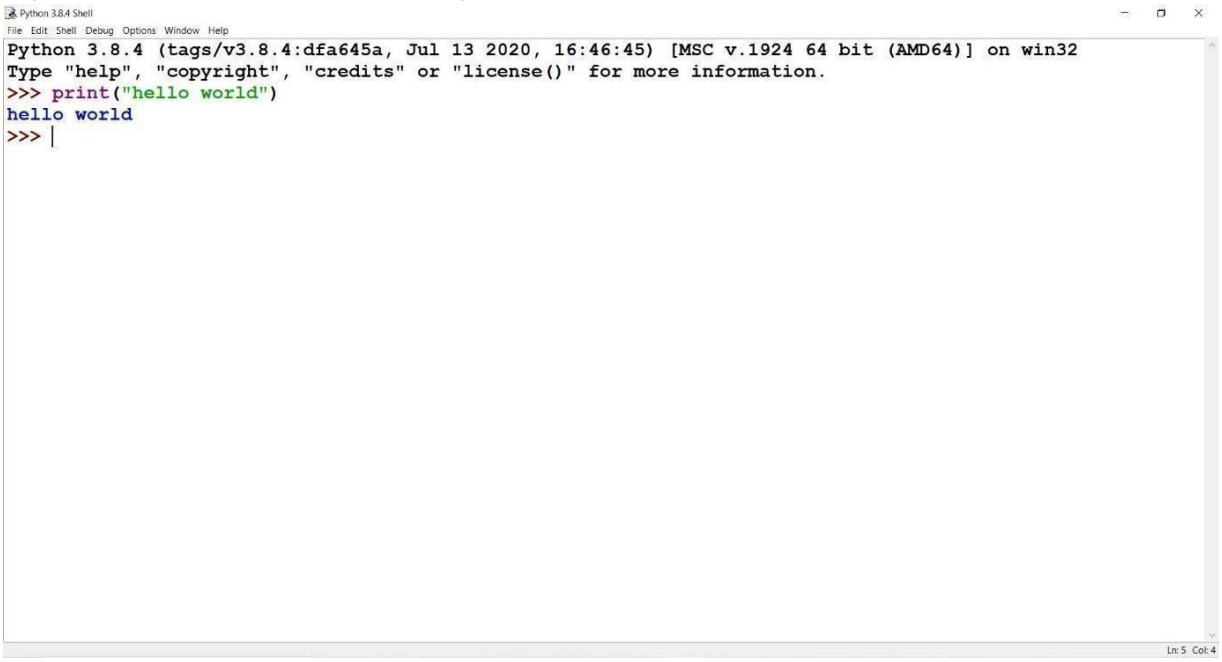

cloud.ibm.com/account/settings
Gmail
YouTube
Maps
News
Translate
Meeting | Microsoft...
IBM Cloud
Search resources and products...
Catalog
Manage
Vigneshwaran D
Account
Account resources
Resource groups
Cloud Foundry orgs
Licenses and entitlements
Tags
Dashboards
Account settings
IBM Cloud Shell settings
Notification distribution list
Classic infrastructure
Subscriptions
Audit log
Company information
Account settings
Account
Vigneshwaran D
ID: 80ad3cd9b9ec4cee9e023e6c0712dd01
Account Type
Trial (Free)
390 days remaining in Trial
Account upgrade
Pay-As-You-Go
Add your credit card to unlock the full power of IBM Cloud with a Pay-As-You-Go account. You'll still be eligible for free runtime and service allowances, and you'll be charged only for paid services that you use.Learn more
Add credit card
Subscription
Get discounted pricing and increased billing predictability when you commit to a set amount of usage over time. Learn more
Upgrade
Need help?
Contact sales
Activate Windows
Go to Settings to activate Windows.

PYTHON IDLE INSTALISATION

Python is a computer programming language often used to build websites and software, automate tasks, and conduct data analysis. Python is a generalpurpose language, meaning it can be used to create a variety of different programs and isn't specialized for any specific problems.

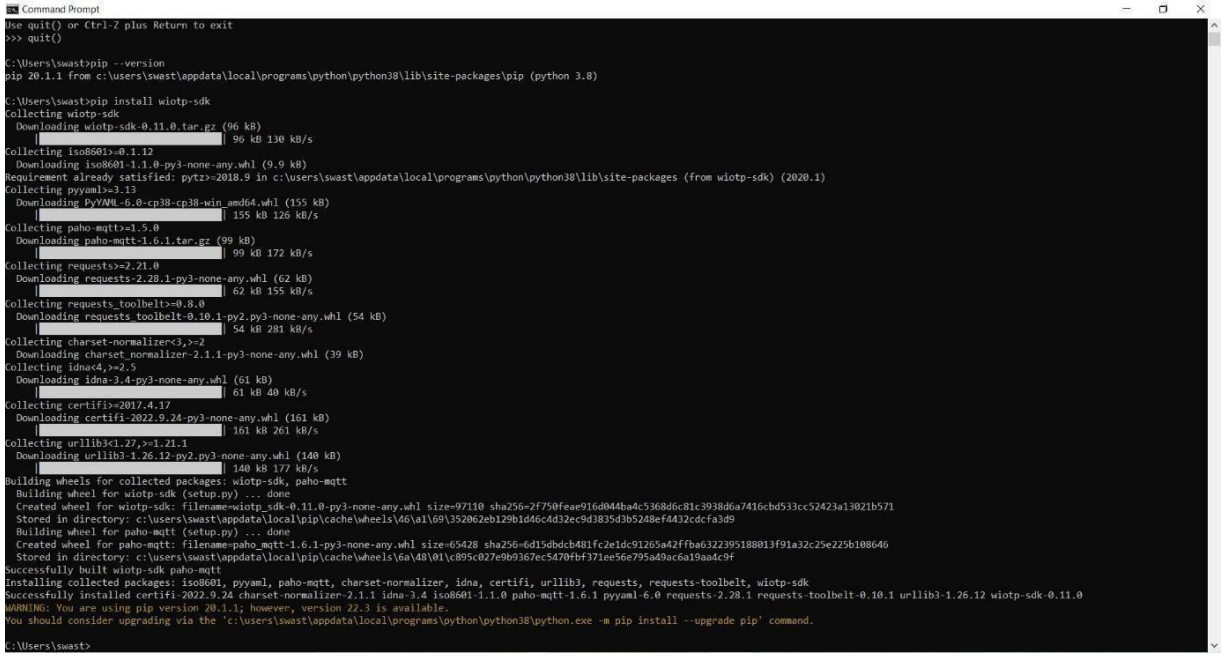
STEP 1:

- Python is installed successfully

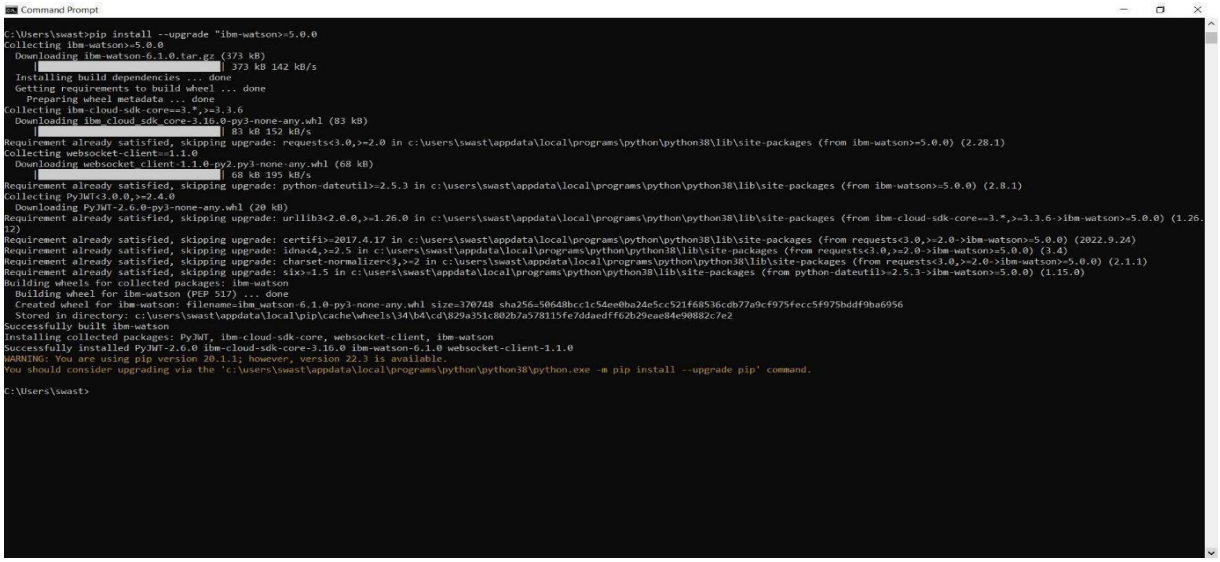


STEP 2:

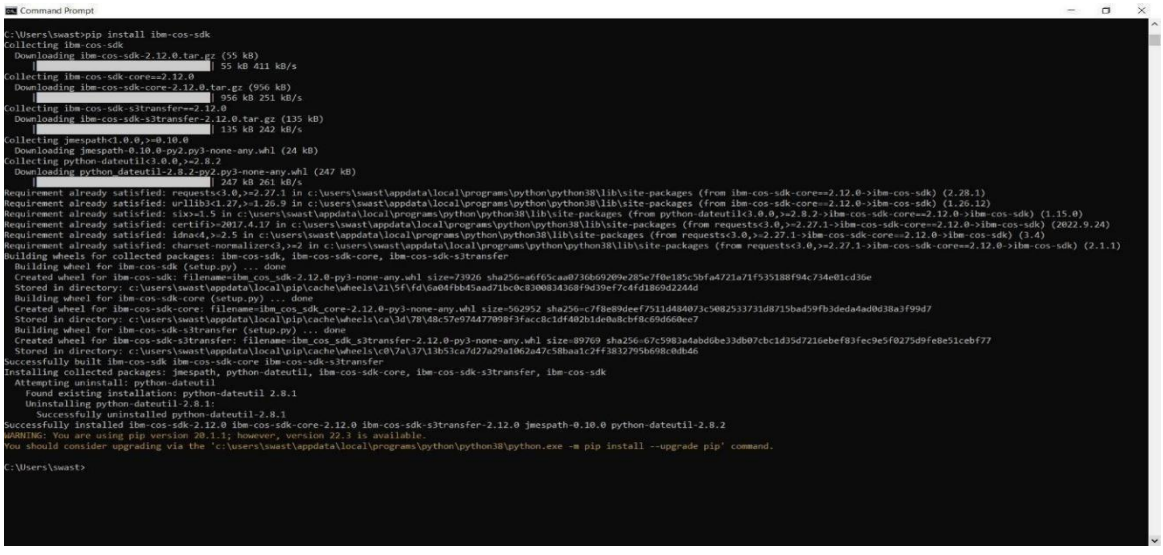
- The required python libraries are installed.
- Watson IoT Python SDK to connect to IBM Watson IoT Platform using python code is installed
- pip install wiotp-sdk



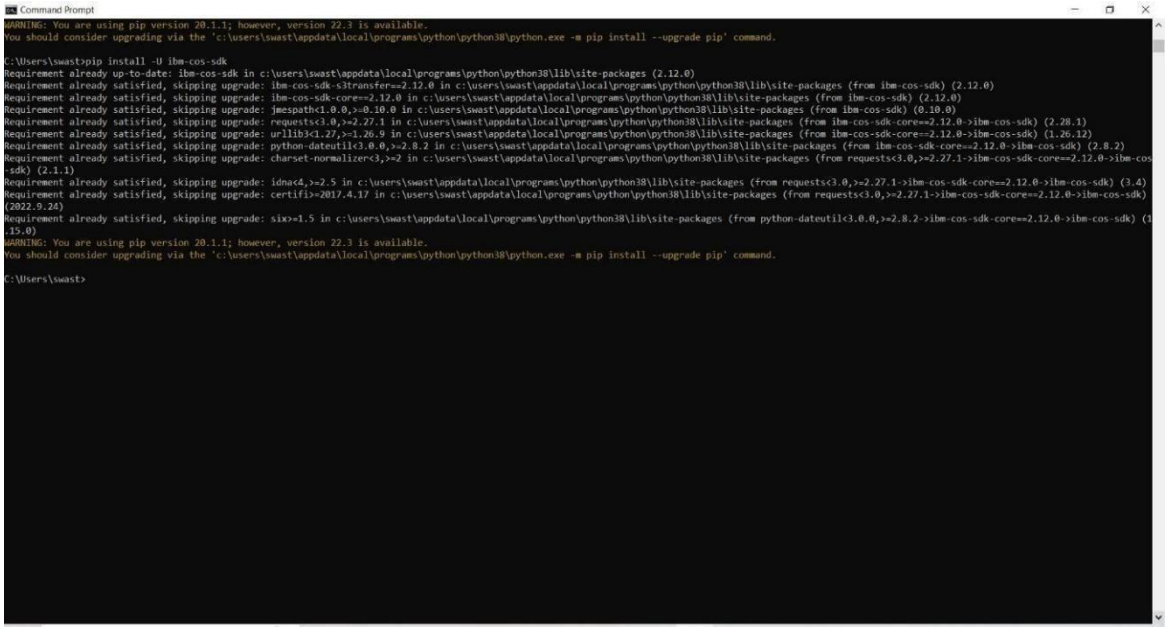
- Python client library for IBM Text to Speech is installed
- pip install --upgrade "ibm-watson>=5.0.0



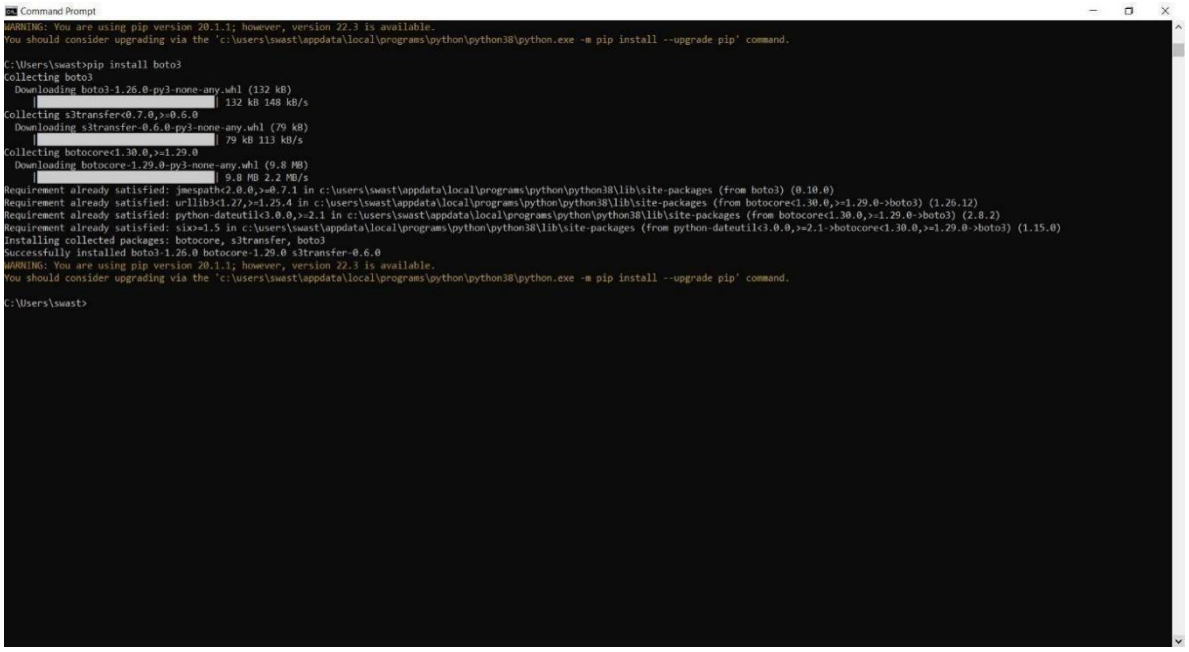
- Required Libraries for cloud object storage is installed
- pip install ibm-cos-sdk



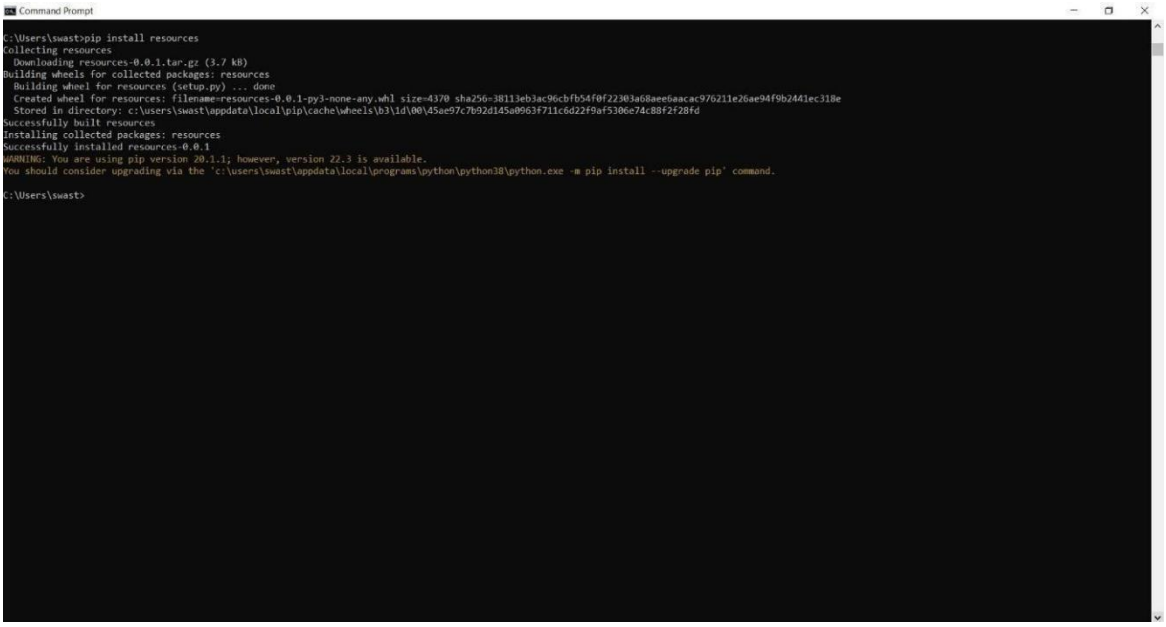
- pip install -U ibm-cos-sdk



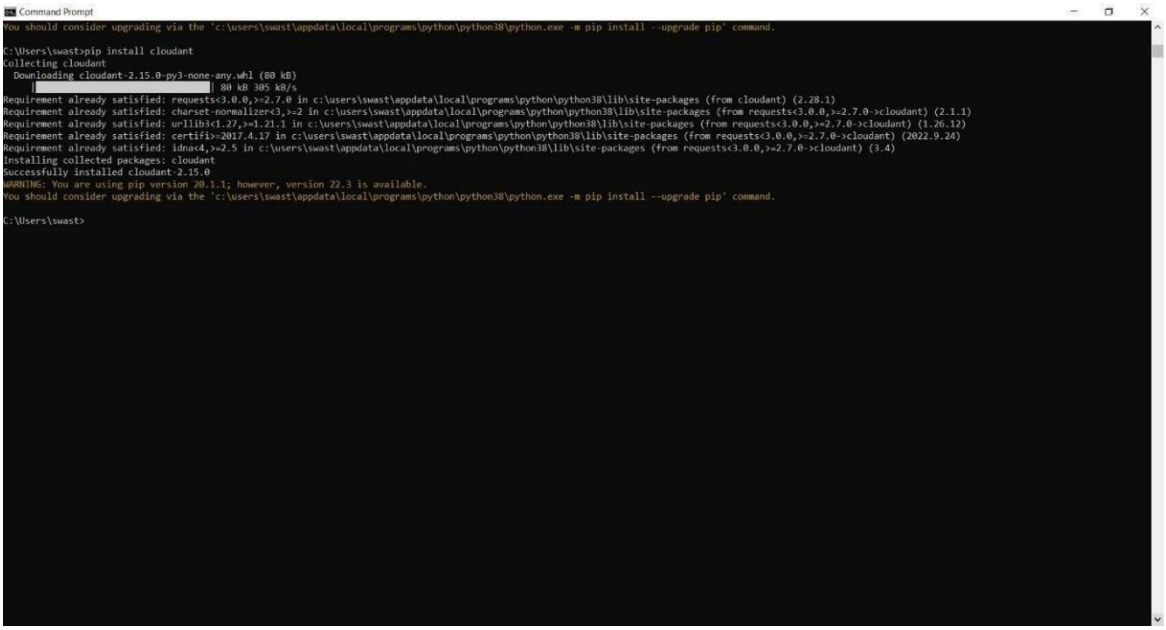
- pip install boto3



- pip install resources



- pip install cloudant

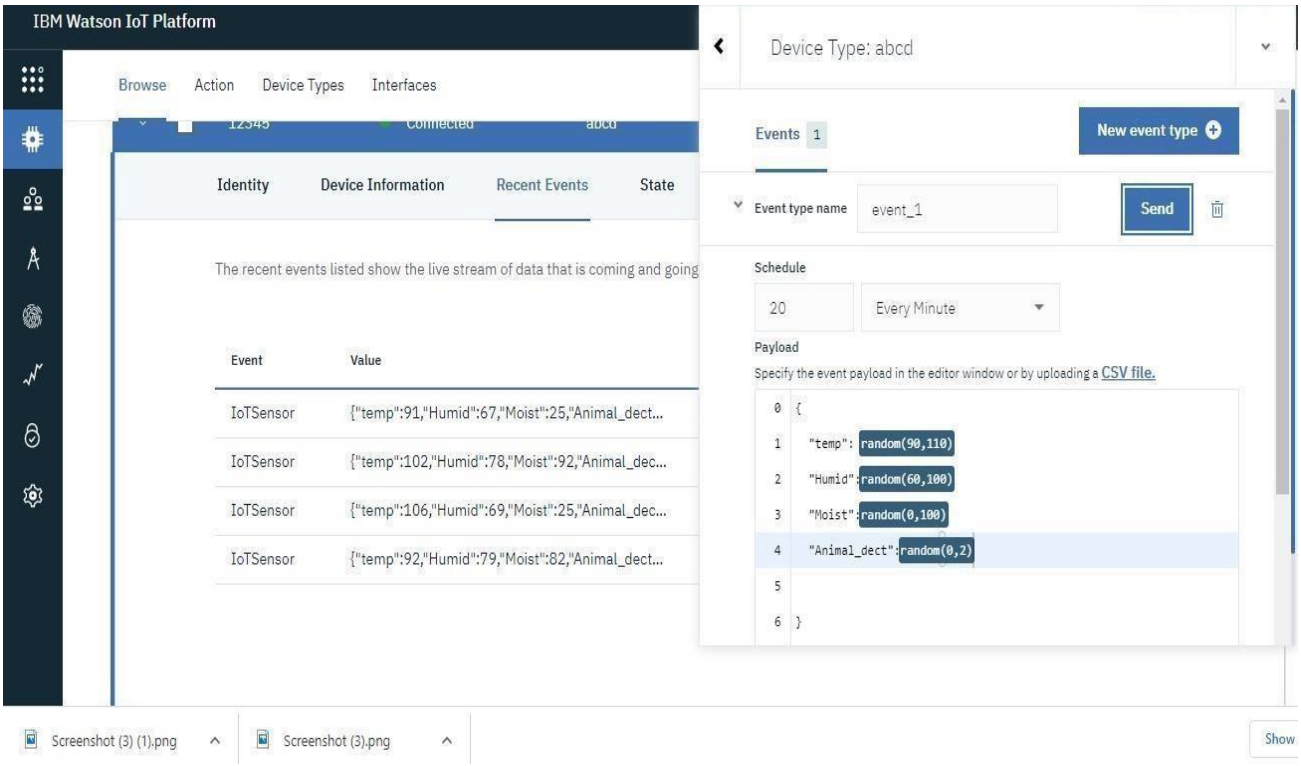


PROJECT DEVELOPMENT

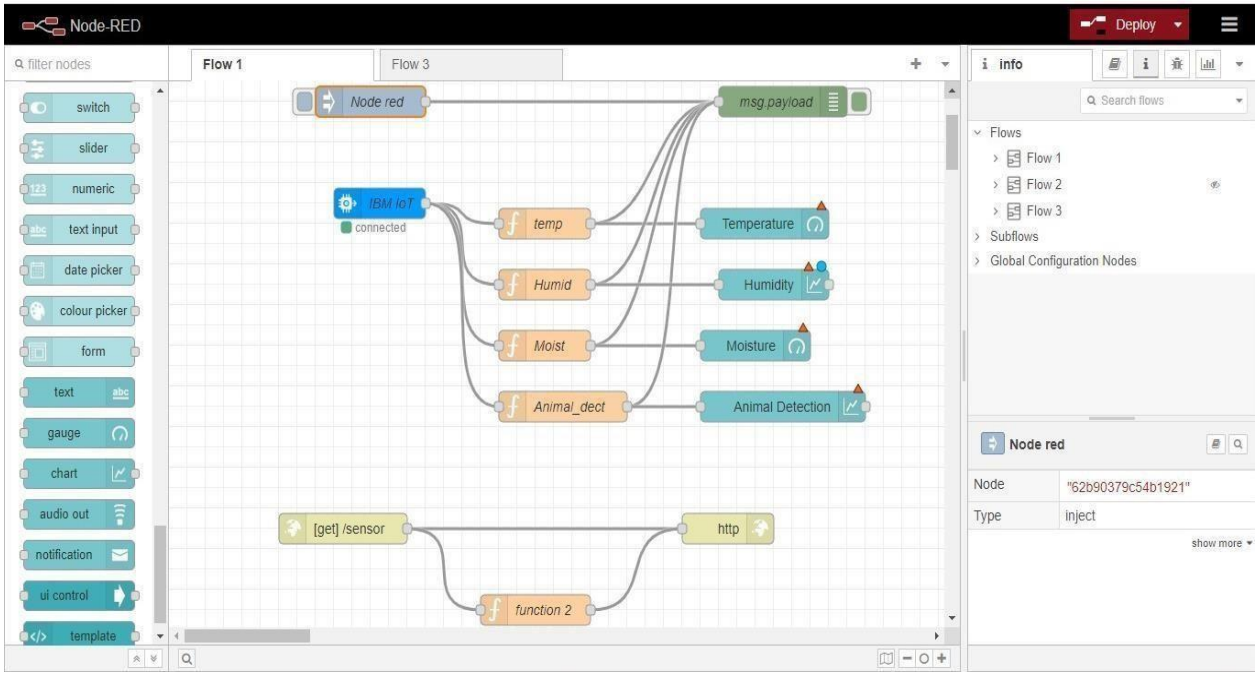
STEP 1: Write a python code for randomize Soil Moisture ,Temperature, Humidity and Animal detection.

STEP 2: Run the python code it send data to IBM IoT Watson Platform.

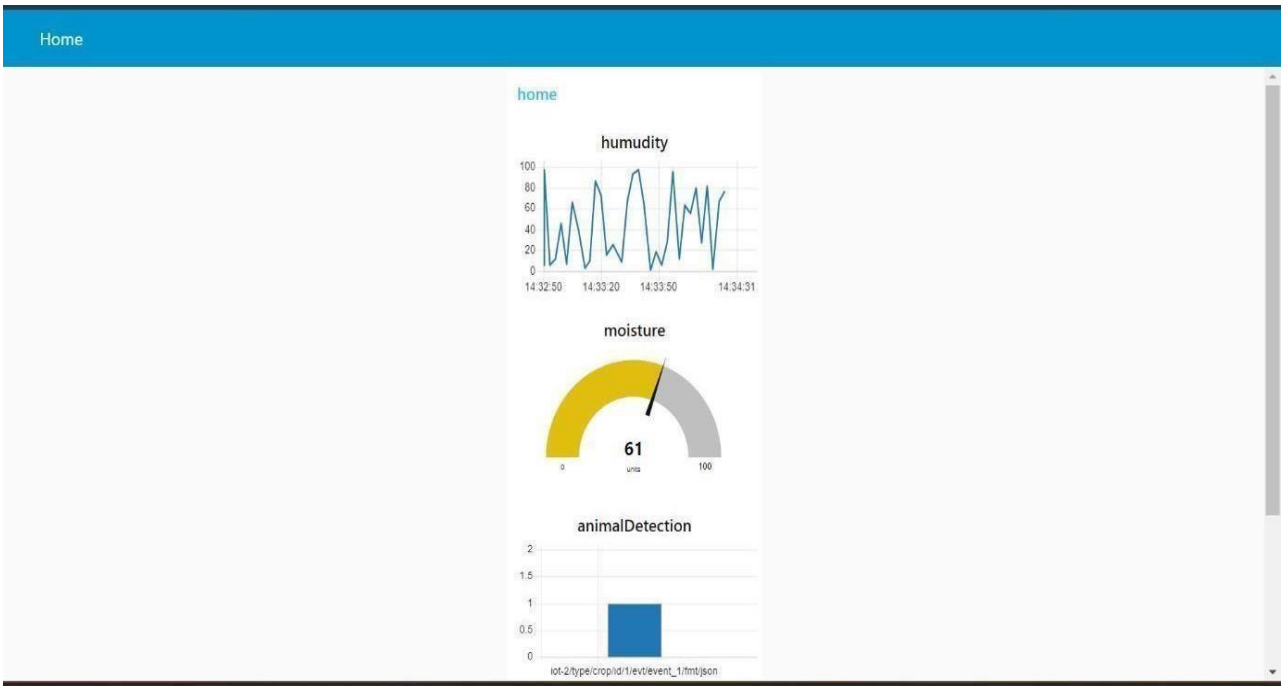
```
int
t=2;
      int e=3;

      void setup()
      {
        Serial.begin(9600);
        pinMode(t,OUTPUT);
        pinMode(e,INPUT);
        pinMode(12,OUTPUT);
      }

      void loop()
      {
        //ultrasonic sensor
        digitalWrite(t,LOW);
        digitalWrite(t,HIGH);
        delayMicroseconds(10);
        digitalWrite(t,LOW);
        float dur=pulseIn(e,HIGH);
        float dis=(dur*0.0343)/2;
        Serial.print("Distance is: ");
        Serial.println(dis);

          //LED ON
        if(dis>=100)
        {
          digitalWrite(8,HIGH);
          digitalWrite(7,HIGH);
        }

        //Buzzer For ultrasonic Sensor
        if(dis>=100)
        {
        for(int i=0; i<=30000; i=i+10)
        {
        tone(12,i);
        delay(1000);
        noTone(12);
        delay(1000);
        }
        }
```



STEP 3: Open Node-RED flow dashboard.



STEP 4: Open Node-RED user interface to show the Soil Moisture, Humidity and Temperature value in gauge.



CHAPTER 7 CODING AND SOLUTIONS

7.1 FEATURE

Python code to generate random data and pass it to IBM Watson IoT platform

Source Code:

```
import time import sys import
ibmiotf.application import
ibmiotf.device import random #Provide your
IBM Watson Device
Credentialsorganization = "wu5b55" deviceType
= "crop1" deviceId = "1234" authMethod =
```

"token" authToken = "1234567890" #

Initialize GPIOtry:

```
                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:

      temp=random.randint(0,
      100)
      Hum=random.randint(0,1
      00)
      moisture=random.randint
      (0,100)


      data = { 'temperature' : temp, 'Humidity': Hum, 'Moisture':moisture }
def myOnPublishCallback():
          print ("Temperature = " + str(temp)+" C Humidity = " +
    str(hum)+ " moisture = " +str(moisture) + "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
    # Disconnect the device and application from the clouddeviceCli.disconnect()
```

7.2 FEATURE 2

Source code is deployed on IBM Watson IoT platform to generate sensor data.SourceCode:

{

"temperature": random(0, 100),

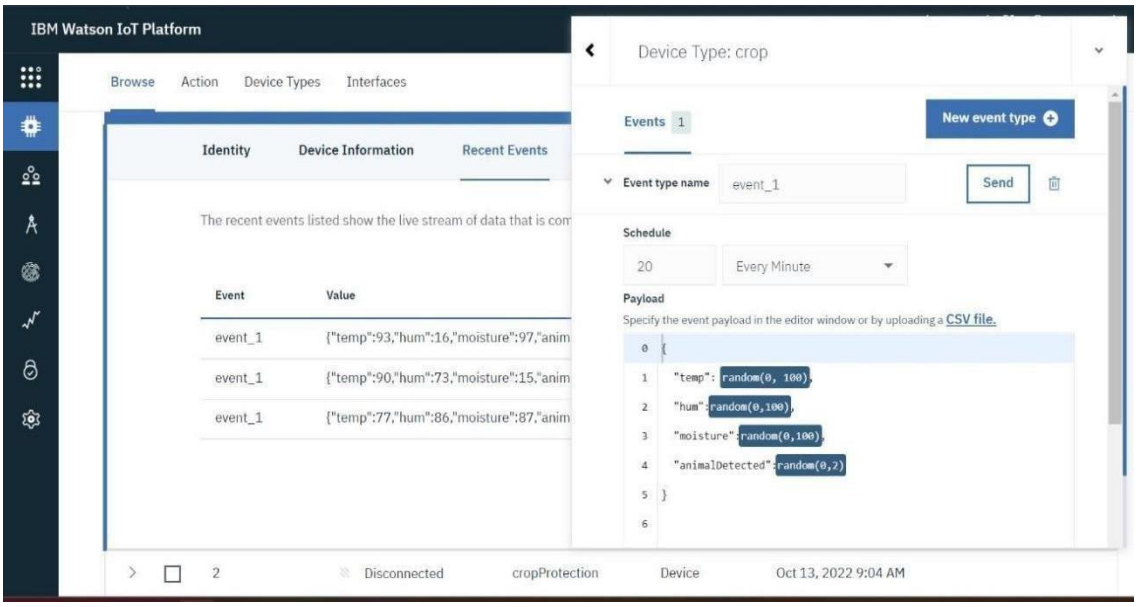
"humidity": random(0, 100),

"moisture": random(0, 100),

“animalDetected”:random(0,2)

}

Output:



7.3 DATABASE SCHEMA

PYTHON CODE TO IBM: import time import sys import ibmiotf.application import ibmiotf.device import random

#Provide your IBM Watson Device Credentials organization = "wu5b55" deviceType = "crop1" deviceId = "1234" authMethod = "token" authToken = "1234567890" # Initialize GPIO 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 thecloud as an event of type
"greeting"      10      times
deviceCli.connect() while
True:

        #Get Sensor Data from DHT11


        temp=random.randint(0,100) Hum=random.randint(0,100)
        moisture=random.randint(0,100)
        data = { 'temperature' : temp, 'Humidity': Hum, 'Moisture':moisture
}
#print data def myOnPublishCallback(): print ("Temperature = " + str(temp)+" C Humidity =
            " + str(hum)+ " moisture =
" + str(moisture) + "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


# Disconnect the device and application from the cloud deviceCli.disconnect()
```

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	10	4	2	3	20
Duplicate	1	0	3	0	4
External	2	3	0	1	6
Fixed	11	2	4	20	37
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won't Fix	0	5	2	1	8
Totals	24	14	13	26	77

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	7	0	0	7
Client Application	51	0	0	51
Security	2	0	0	2
Outsource Shipping	3	0	0	3

CHAPTER 8 TESTING 8.1 TEST CASES

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

8.2 USER ACCEPTANCE TESTING

This report shows the number of test cases that have passed, failed, and untested

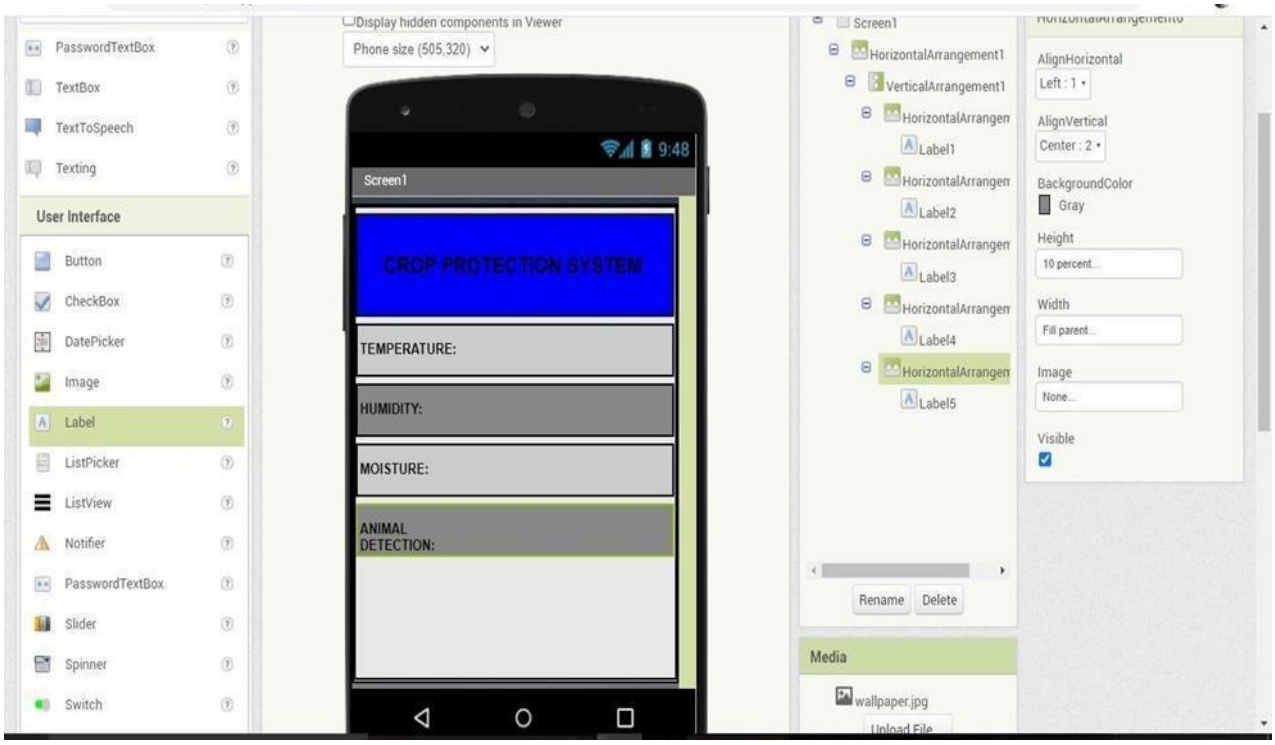
Exception Reporting	9	0	0	9
Final Report Output	4	0	0	4
Version Control	2	0	0	2

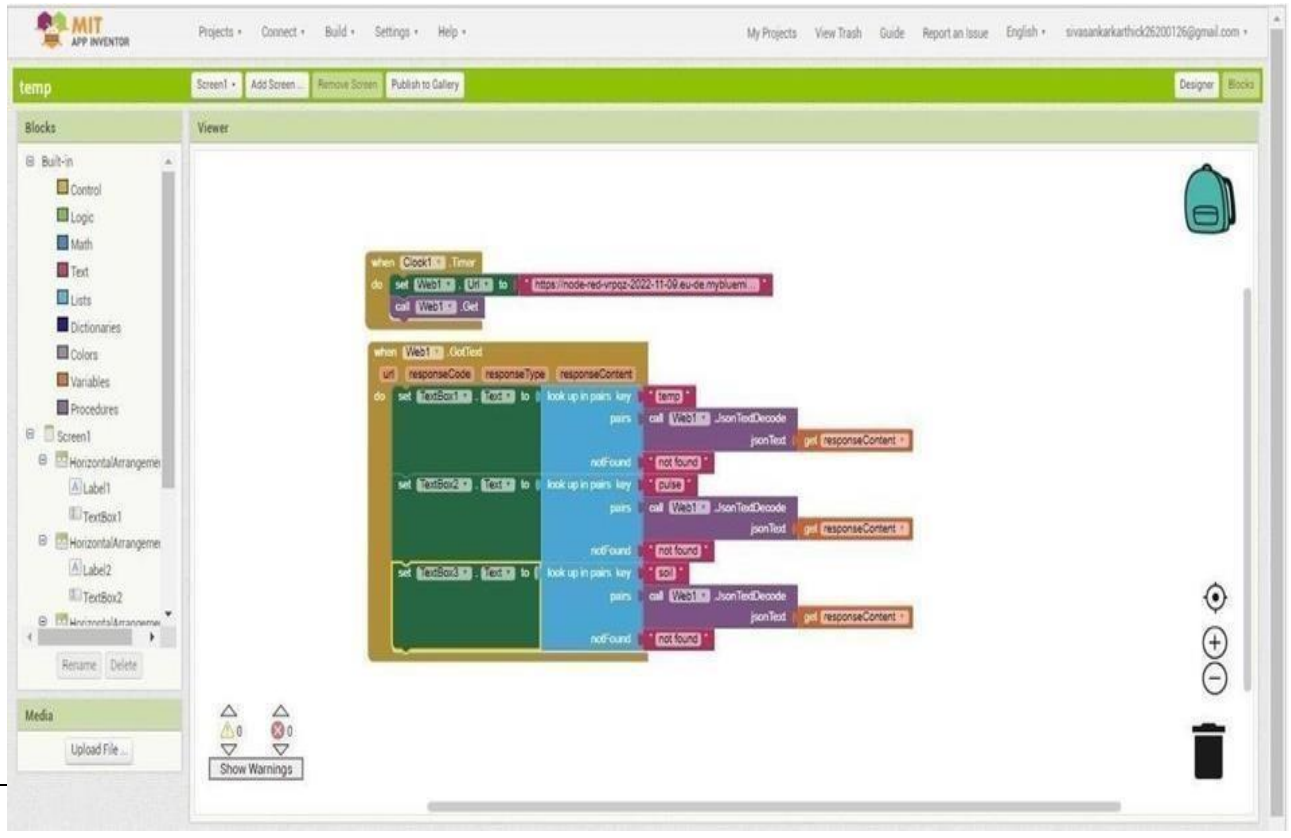
CHAPTER 9 RESULT

9.1 PERFORMANCE METRICS

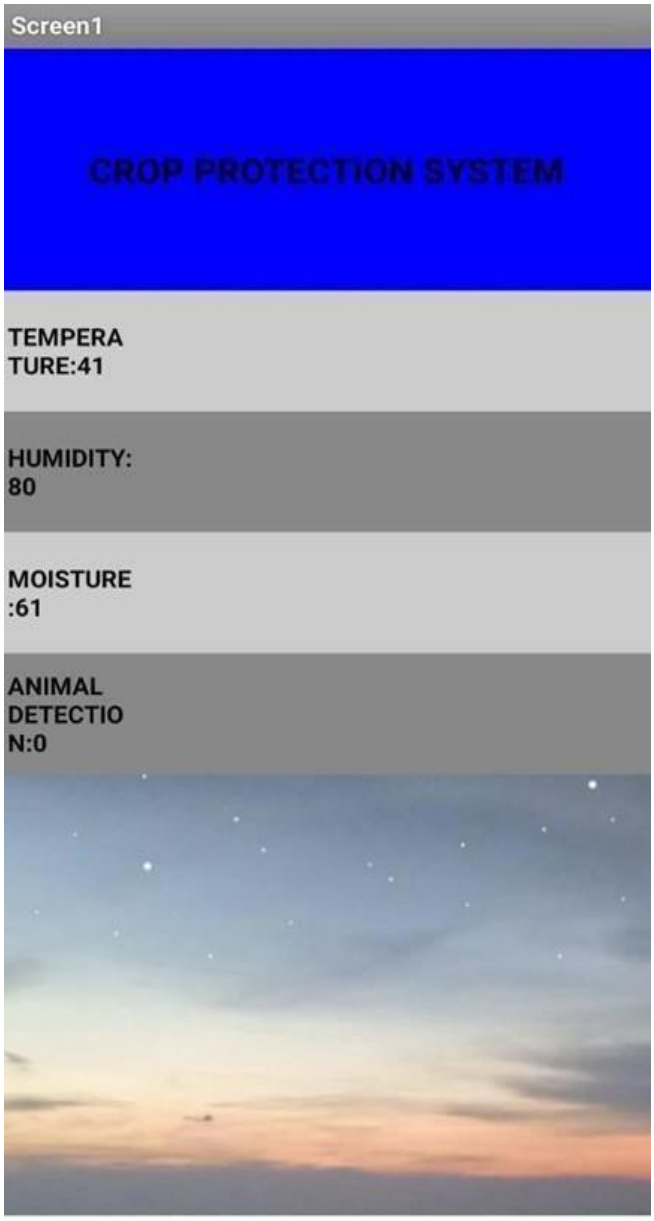
MIT APP INVENTOR:

STEP 1: MIT APP inventor to design the APP.




MIT APP INVENTOR
Projects
Connect
Build
Settings
Help
My Projects
View Trash
Guide
Report an Issue
English
temp
Screen1
Add Screen ...
Remove Screen
Publish to Gallery
Designer
Blocks
Blocks
Viewer
Built-in
Control
Logic
Math
Text
Lists
Dictionaries
Colors
Variables
Procedures
Screen1
Label1
TextBox1
Label2
TextBox2
Rename
Delete
Media
Upload File ...
Show Warnings
when Clock1 .Timer
do set Web1 . Url to
call Web1 .Get
when Web1 .GotText
url responseCode responseType responseContent
do set TextBox1 . Text to look up in pairs key temp
pairs call Web1 .JsonTextDecode
jsonText get responseContent
notFound not found
set TextBox2 . Text to look up in pairs key pulse
pairs call Web1 .JsonTextDecode
jsonText get responseContent
notFound not found
set TextBox3 . Text to look up in pairs key soil
pairs call Web1 .JsonTextDecode
jsonText get responseContent
notFound not found

STEP 2: Customize the App interface to Display the Values.


Screen1
CROP PROTECTION SYSTEM
TEMPERA
TURE:41
HUMIDITY:
80
MOISTURE
:61
ANIMAL
DETECTIO
N:0

ER 10
ISADVANTAGES

himals closely, even if they are physically

rove productivity and enable management of
note sensing.

far from access to the internet.

a reliably at any time from any location, so
ed monitoring system to be useless.

griculture is expensive.

sensors (light, humidity, temperature, soil

luctivity and pH)

34

CHAPTER 11 CONCLUSION

AS a result of this system, we can detect the changes in the field easily and intimate the farmers about it and also we can take precautions and do remedies accordingly. Here we use very low power consuming highly efficient components that give us accurate results and also they perform at low data rate conditions without any lag and help in finding the remedies. This crop protection system helps in detection of all kinds of external dangers and it saves time and money to the farmers before any loss that may occur. With the help of this system the farmers can be in a peaceful environment at ease without any pressure.

CHAPTER 12 FUTURE SCOPE

Study and analysis of the developed Crop protection systems for its costeffectiveness with the development of Arduino based variable frequency Ultrasonic birddeterrent circuit. outline of the crop damage caused by a particular Wild animal if thebehavioral features of the With the reduced cost in the smart phones.

CHAPTER 13

APPENDIX

13.1SOURCE CODE

The source code has been uploaded in github. To refer the final sourse code click "SOURCE CODE"

13.2 GITHUB & PROJECT DEMO LINK

GITHUB LINK

The github link:" https://github.com/IBM-EPBL/IBM-Project-25548-1659967044

PROJECT DEMO LINK

The Project Demo link: https://github.com/IBM-EPBL/IBM-Project-255481659967044

CHAPTER 14

REFERENCE

[1]Priyanka Deotale, Prasad Lokulwar (2021) have presented the paper titled “Smart Crop Protection System from Wild animals Using IoT” . Crops in the agricultural land are destroyed by the domestic animals and wild animals ,it is one of the reason for low productivity . Farmers can't be there for entire 2 hours so we have make use of IOT to control the animals destroying the field . Once the animal is detected the system will larm and start lightning in the corner of the farm . It will not harm any animals and we can also protect the crops.

[2] N.S. Gogul Dev , K.S. Sreenesh , P.K. Binu (2019) has presented a paper titled “IoT Based Automated Crop Protection System” . Low productivity of crops is one of the main problems faced by the farmers in our country. This can be because of two main reasons. Crops destroyed by wild animals and because of bad weather condition. This paper provides a solution to the destruction of crops by animals. This system will provide a complete technical solution using the Internet of things (IOT) to the farmers to prevent their crops from wild animals and provide information to the farmers to maximize their production. Animals are detected using PIR sensors and cameras where animals are identified using TensorFlow image processing Techniques. Raspberry PI is used as the processing unit of the system and sound buzzers are used to emit the ultrasound frequencies