# Fertilizers Recommendation System for DiseasePrediction

**IBM**

**PROJRCT REPORT**

*Submitted by*

**TEAM ID : PNT2022TMID15849**

# INDEX

**1.INTRODUCTION**

1.1 Project Overview

1.2 Purpose

**2.LITERATURE SURVEY**

2.1 Existing problem

2.2 References

2.3 Problem Statement Definition

**3.IDEATION & PROPOSEDSOLUTION**

3.1 Empathy Map Canvas

3.2 Ideation & Brainstorming

3.3 Proposed Solution

3.4 Problem Solutionfit

**4.REQUIREMENT ANALYSIS**

4.1 Functional requirement

4.2 Non-Functional requirements

**5.PROJECT DESIGN**

5.1 Data Flow Diagrams

5.2 Solution & Technical Architecture

5.3 User Stories

**6.PROJECT PLANNING &SCHEDULING**

- 6.1 Sprint Planning& Estimation
- 6.2 Sprint DeliverySchedule
- 6.3 Reports from JIRA

**7.CODING & SOLUTIONING (Explainthe features added in the project along with code)**

- 7.1 Feature 1
- 7.2 Feature 2
- 7.3Database Schema (if Applicable)

**8.TESTING**

- 8.1 Test Cases
- 8.2 User Acceptance Testing

**9.RESULTS**

- 9.1Performance Metrics

**10.ADVANTAGES & DISADVANTAGES**

**11.CONCLUSION**

**12.FUTURE SCOPE**

**13.APPENDIX**

- Source Code
- GitHub &Project Demo Link

# 1. INTRODUCTION

1.1 Overview Inthis project, two datasets name fruit datasetand vegetable datasetare collected. The collected datasets are trained and tested with deep learning neural network named Convolutional Neural Networks (CNN). First, the fruit dataset is trained and then tested with CNN. It has 6 classes and all the classes are trained and tested. Second, the vegetable dataset is trained and tested. The software used for training and testing of datasets is Python. All the Python codes are first written in Jupyter notebook suppliedalong with Anaconda Python and then the codes are tested in IBM cloud. Finally, a web- based framework is designed with help Flask a Python library. There are 2 html files are created in templates folder along with their associated files in static folder. The Python program 'app.py' used to interfacewith these two webpages is written in Spyder-Anacondapythonand tested.

1.2 Purpose This project is used to test the fruits and vegetables samples and identify the different diseases. Also, this project recommends fertilizers for predicted diseases.

# 2. LITERATURE SURVEY

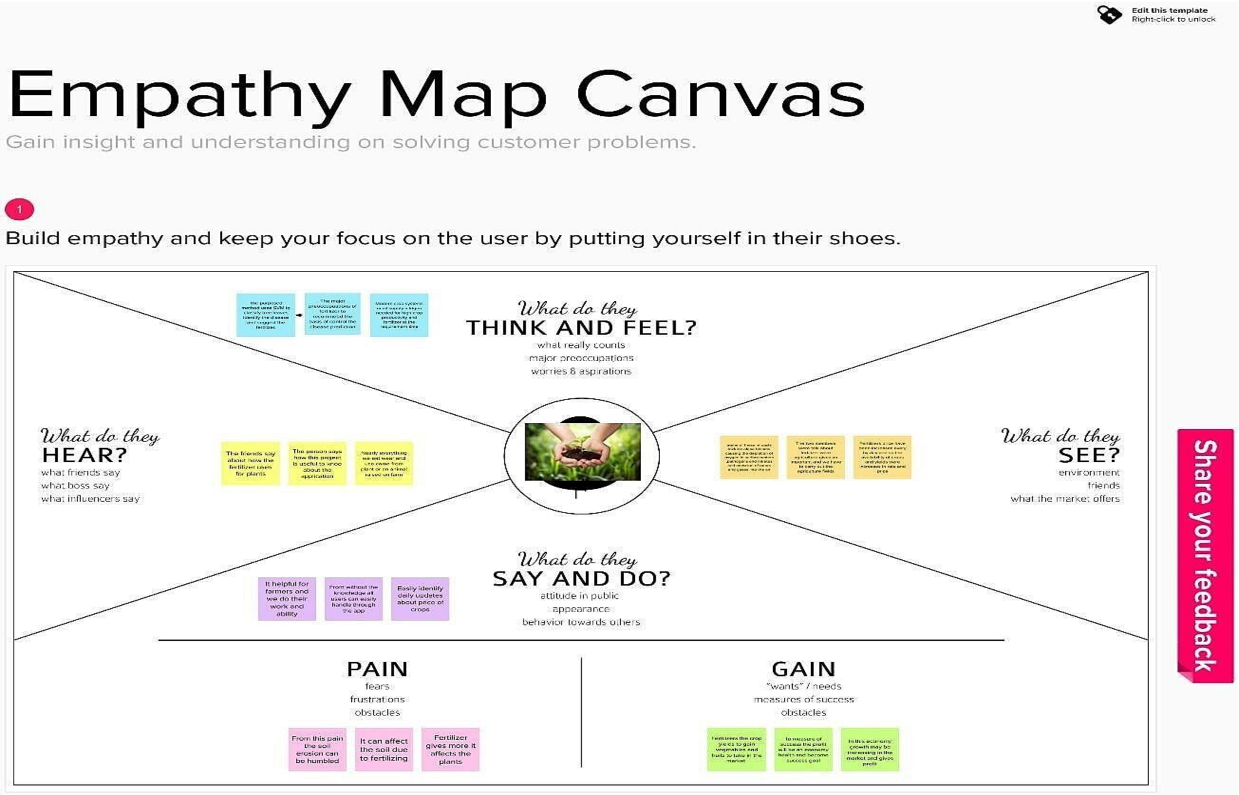
2.1 Existing problem should proposed a method for leaf disease detection and suggest fertilizers to cure leaf diseases. But the method involves less number of train and test sets which results in poor accuracy. It proposed a simple prediction method for soil- based fertilizer recommendation system for predicted crop diseases. This method gives less accuracy and prediction. IoT based system for leaf disease detection and fertilizer recommendation which is based on MachineLearning techniques yields less 80 percentageaccuracies.

2.2 Neural Network Based Fertilizers Recommendation _System For Disorder Classification And Prediction In Petal Images.This methodology requiresexperts who canrecognize varietiesin leaf shading. Ordinarily a similar malady is characterized by a few specialists as a different sickness. This arrangement is exorbitant, in light of the fact that it requires nonstop expert management

2.3 Agriculture is the most important sector in today's life. Most of the plants areaffected by a wide variety of bacterial and fungal diseases. In agricultural aspects, if the plant is affected by leaf disease then it reduces the growth and productiveness. Generally,the plant diseases are caused by the abnormal physiological functionalities of plants

# 3. IDEATION & PROPOSEDSOLUTION

## 3.1 Empathy Map Canvas



Empathy Map Canvas

Gain insight and understanding on solving customer problems.

1

Build empathy and keep your focus on the user by putting yourself in their shoes.

What do they THINK AND FEEL?

what really counts
major preoccupations
worries & aspirations

The proposed method uses SVM to classify tree leaves, identify the disease and suggest the fertilizer

The major preoccupations of fertilizers to recommend the basis of control the disease prediction

[illegible] needed for high crop productivity and fertilizer at the requirement time

What do they HEAR?

what friends say
what boss say
what influencers say

The friends say about how the fertilizer uses for plants

The person says how this project is useful to knoe about the appication

Nearly everything we eat wear and use came from plant or an animal raised on farm

What do they SEE?

environment
friends
what the market offers

[illegible]

The two members were talk about fertilizers were agriculture gives an important and we have to carry out the agriculture fields

Fertilizers price have been increased every [illegible] availability of crops and yields were increased in rate and price

What do they SAY AND DO?

attitude in public
appearance
behavior towards others

It helpful for farmers and we do their work and ability

From without the knowledge all users can easily handle through the app

Easily identify daily updates about price of crops

PAIN

fears
frustrations
obstacles

From this pain the soil erosion can be humbled

It can affect the soil due to fertilizing

Fertilizer gives more it affects the plants

GAIN

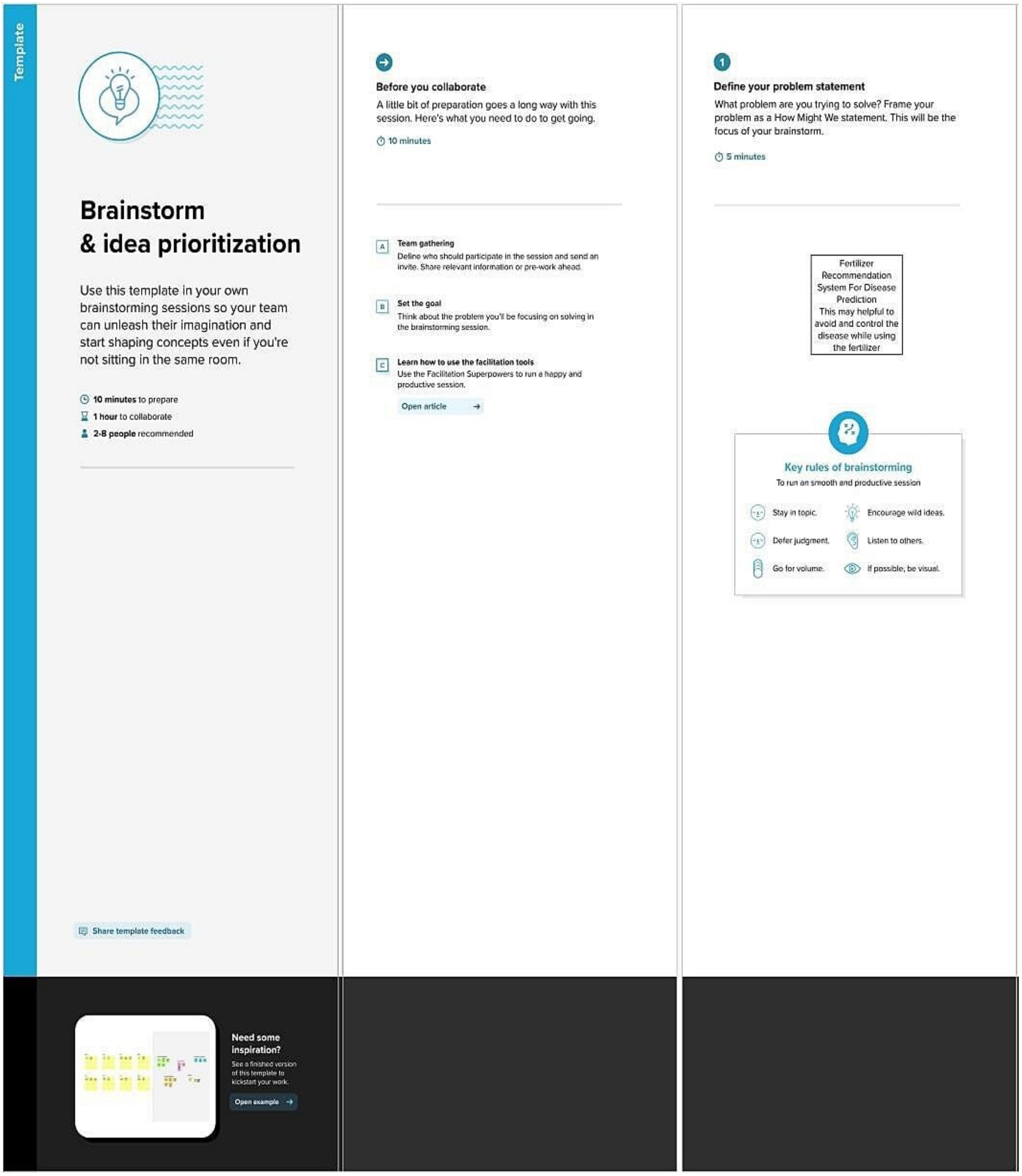
"wants" / needs
measures of success
obstacles

Fertilizers the crop yields to gain vegetables and fruits to take in the market

In measure of success the profit will be an economy health and become success goal

In this economy growth may be increasing in the market and gives profit

## 3.2 Ideation & Brainstorming



## Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

- **10 minutes** to prepare
- **1 hour** to collaborate
- **2-8 people** recommended

**Need some inspiration?**

See a finished version of this template to kickstart your work.

**Before you collaborate**

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

10 minutes

A **Team gathering**
Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

B **Set the goal**
Think about the problem you'll be focusing on solving in the brainstorming session.

C **Learn how to use the facilitation tools**
Use the Facilitation Superpowers to run a happy and productive session.

1 **Define your problem statement**

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

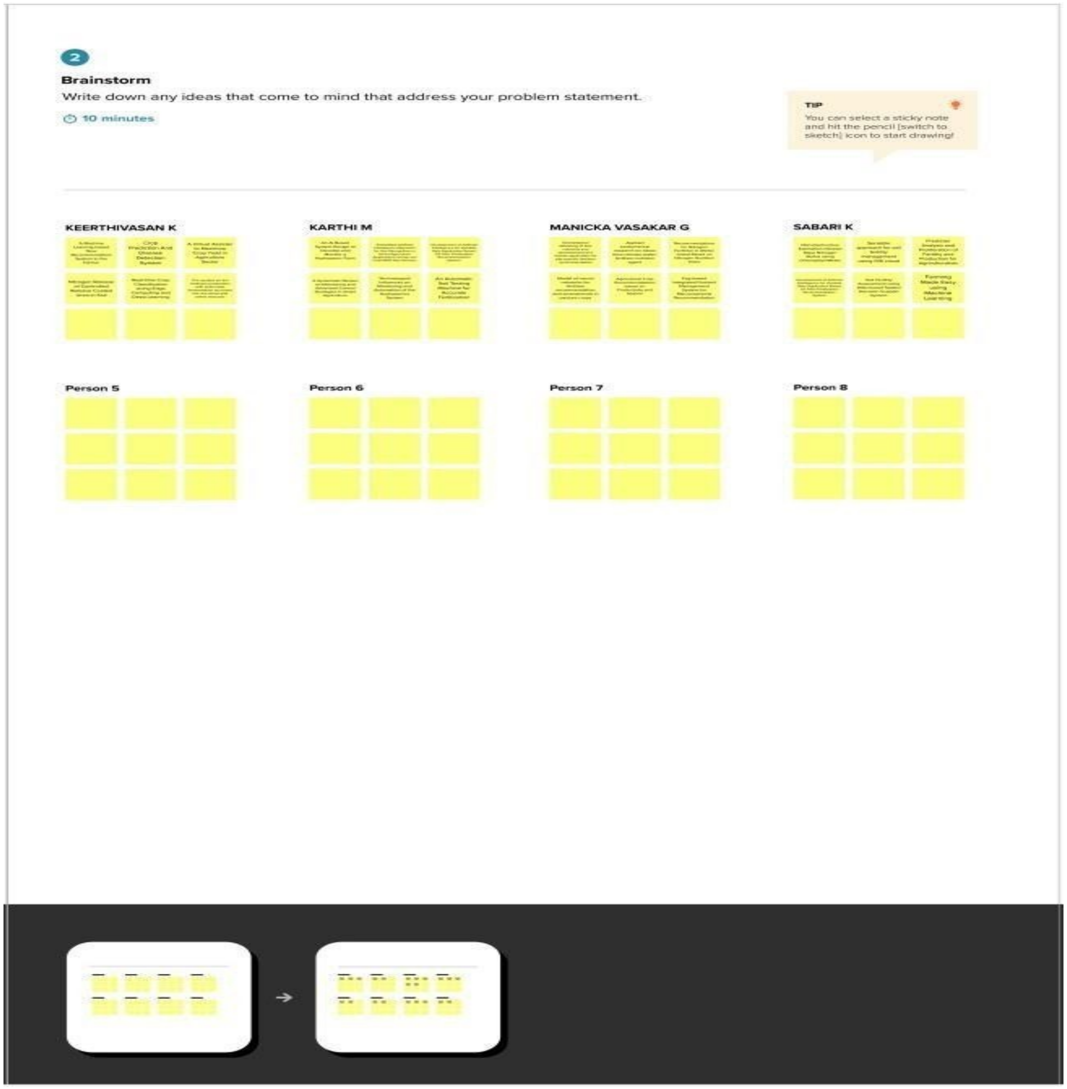
5 minutes

Fertilizer
Recommendation
System For Disease
Prediction
This may helpful to
avoid and control the
disease while using
the fertilizer

**Key rules of brainstorming**

To run an smooth and productive session

| | |
|---|---|
| Stay in topic. | Encourage wild ideas. |
| Defer judgment. | Listen to others. |
| Go for volume. | If possible, be visual. |



2

Brainstorm

Write down any ideas that come to mind that address your problem statement.

10 minutes

TIP

You can select a sticky note and hit the pencil [switch to sketch] icon to start drawing!

KEERTHIVASAN K

- [illegible]
- Crop Prediction And Disease Detection System
- A Virtual Assistant to Maximise Crop Yield in Agriculture Sector
- [illegible]
- Real-Time Crop Classification using Edge Computing and Deep Learning
- [illegible]

KARTHI M

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- An Automatic Soil Testing Machine for Accurate Fertilization

MANICKA VASAKAR G

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

SABARI K

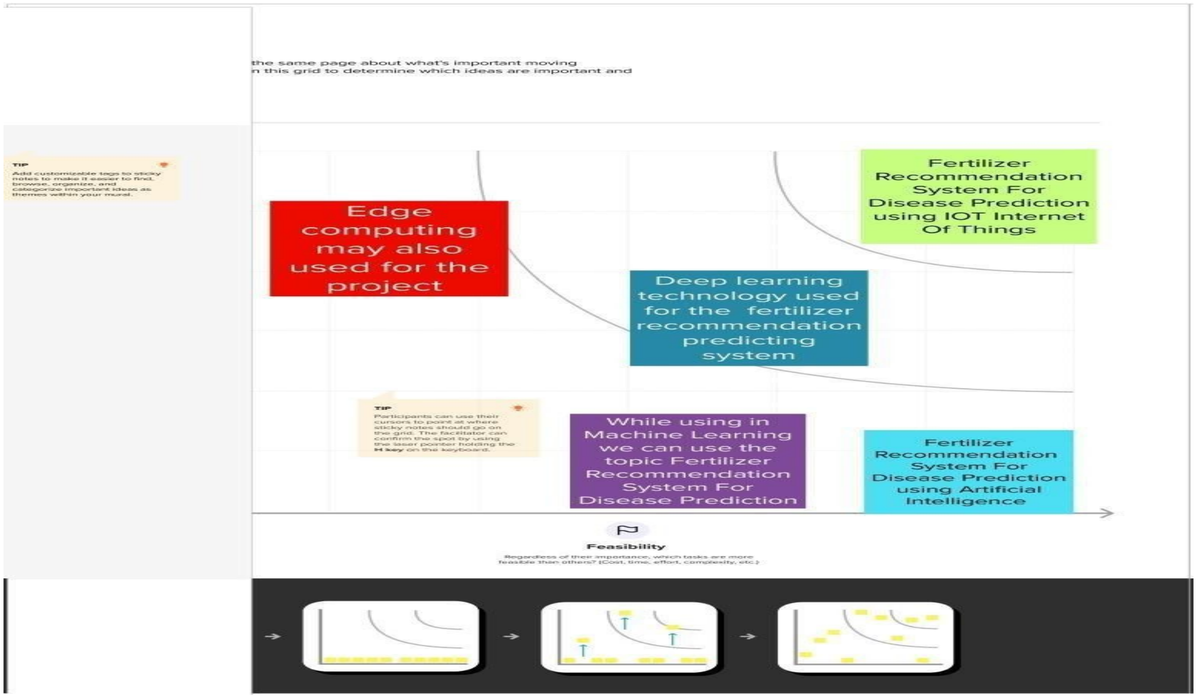
- [illegible]
- Sensible approach for soil fertility management using IOT cloud
- [illegible]
- [illegible]
- [illegible]
- Farming Made Easy using Machine Learning

Person 5

Person 6

Person 7

Person 8



the same page about what's important moving
n this grid to determine which ideas are important and

TIP

Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas as themes within your mural.

Edge computing may also used for the project

Fertilizer Recommendation System For Disease Prediction using IOT Internet Of Things

Deep learning technology used for the fertilizer recommendation predicting system

TIP

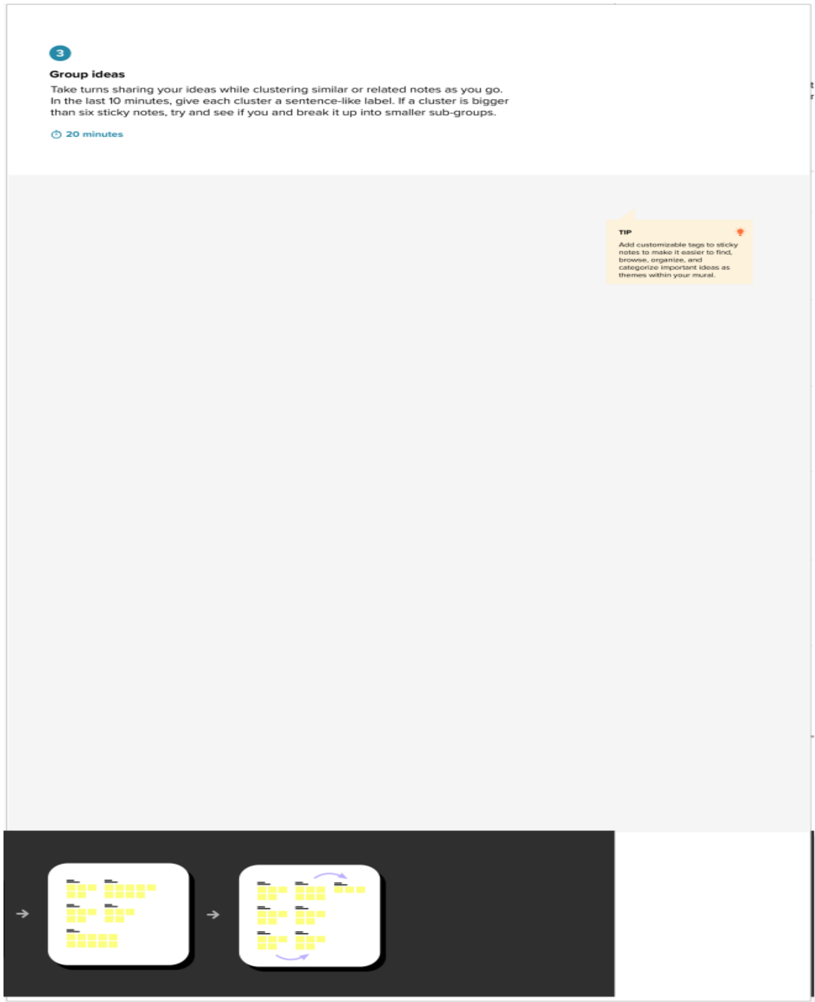
Participants can use their cursors to point at where sticky notes should go on the grid. The facilitator can confirm the spot by using the laser pointer holding the **H key** on the keyboard.

While using in Machine Learning we can use the topic Fertilizer Recommendation System For Disease Prediction

Fertilizer Recommendation System For Disease Prediction using Artificial Intelligence

**Feasibility**

Regardless of their importance, which tasks are more feasible than others? (Cost, time, effort, complexity, etc.)



3

**Group ideas**

Take turns sharing your ideas while clustering similar or related notes as you go. In the last 10 minutes, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

20 minutes

TIP

Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas as themes within your mural.

**After you collaborate**

You can export the mural as an image or pdf to share with members of your company who might find it helpful.

Quick add-ons

A **Share the mural**
**Share a view link** to the mural with stakeholders to keep them in the loop about the outcomes of the session.

B **Export the mural**
Export a copy of the mural as a PNG or PDF to attach to emails, include in slides, or save in your drive.

Keep moving forward

**Strategy blueprint**
Define the components of a new idea or strategy.
Open the template →

**Customer experience journey map**
Understand customer needs, motivations, and obstacles for an experience.
Open the template →

**Strengths, weaknesses, opportunities & threats**
Identify strengths, weaknesses, opportunities, and threats (SWOT) to develop a plan.
Open the template →

Share template feedback

## 3.3 Proposed Solution

| S. No. | Parameter | Description |
|---|---|---|
| 1 | Problem Statement (Problem to besolved) | An automated system is introduced to identify different diseases on plants by checking the symptoms shownon the leavesof the plant. Deep learning techniques are used to identify the diseases and suggest theprecautions that can be takenfor those diseases. |
| 2 | Idea / Solution description | Develop an website foran farmers |
| 3 | Novelty / Uniqueness | The major agricultural products in India are rice, wheat, pulses,and spices. As our population is increasing rapidlythe demand for agriculture products also increasing<br>alarmingly. A huge amountof data areincremented from various field of agriculture. |

## 3.4 Problem Solution fit

Agriculture is one field which has a high impact on life and economic status of human beings. Improper management leads to loss in agricultural products. Farmers lack the knowledge of disase and hence they produce less production. Farmers are unable to explain disease properly on call need to analysis the image of affected area of disease. Though, images and videos of crops provide better view and agro scientists can provide a better solution to resolve the issues related to healthy crop yet it not been informed to farmers. It is required to note that if the productivity of the crop is not healt high risk of providing good and healthy nutrition. Due to the improvement and development in technology where devices are smart enough to recognize and detect plant diseases. Recognizing illness can prompt faster treatment in order to lessen the negative impacts on harvest. This paper therefore focus upon plant disease detection using image processing approach. This work utilizes an open dataset of pictures used to unhealthy and solid plants, where convolution system and semi supervised techniques are characterize crop species and detect the sickness. Farmers can interact with portal build interact with user interface to upload images of diseases leaf the image will be processing and train data to the a These types of algorithm may evaluate the processing of image and predict to the user interface.

# 4. REQUIREMENT ANALYSIS

## 4.1 FUNCTIONAL REQUIREMENT

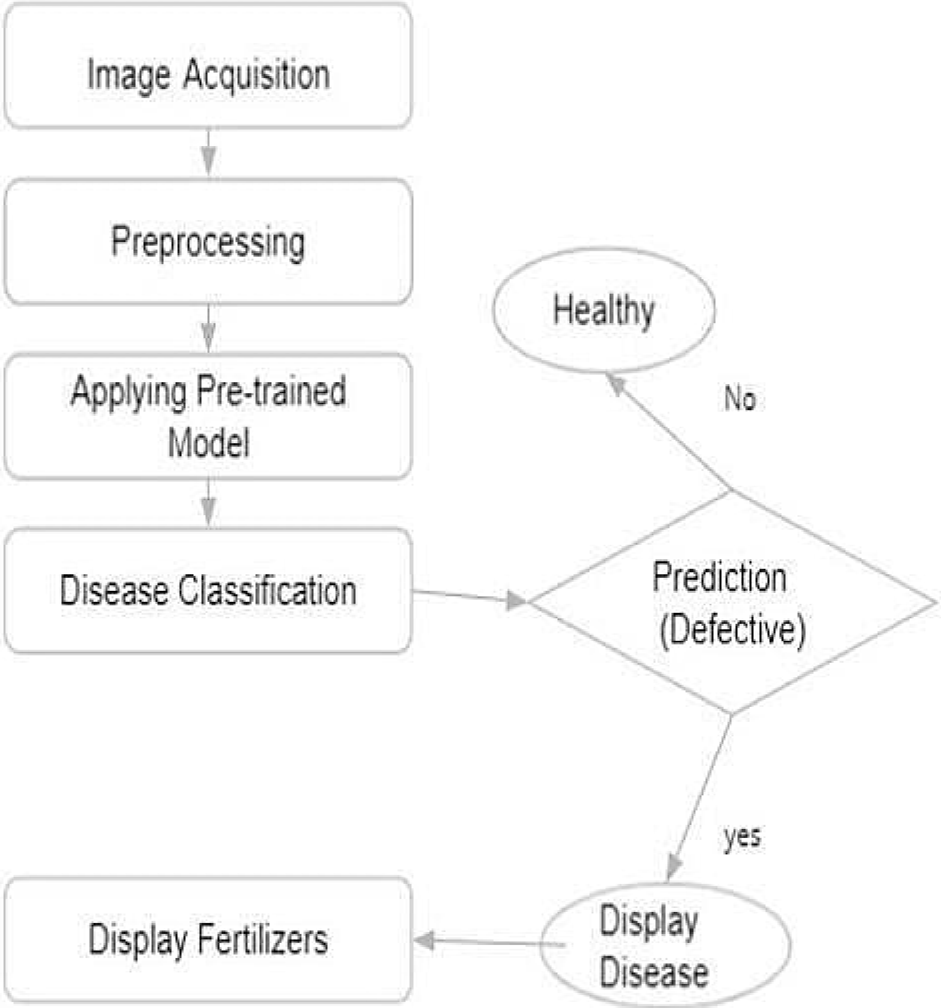
| FR.NO | requirement | lSub requirement(story/subtask) |
|---|---|---|
| FR-2 | User confirmation | Confirmation via OTP<br>Confirmation via Email |
| FR-3 | Capturing image | Capture the image of the leaf And checkthe parameter of the captured image. |
| FR-4 | Image processing | Upload theimage for the prediction of the disease in the leaf. |
| FR-5 | Leaf identification | Identify the leaf and predictthe disease in leaf. |
| FR-6 | Image description | Suggesting the best fertilizer for the disease. |

## 4.2 NON FUNCTIONAL REQUIREMENT

| **NFR. NO** | **Non-functionalrequirement** | **Description** |
|---|---|---|
| NFR-1 | Usability | Datasets of all the leaf is used to detecting the disease that present in the leaf. |
| NFR-2 | Security | The information belongs to the userand leaf aresecured highly. |
| NFR-3 | Reliability | The leaf qualityis important for the predicting thedisease in leaf. |
| NFR-4 | Performance | The performance is based on the quality of theleaf used fordisease prediction |
| NFR-5 | Availability | It is available for all user to predict the disease in the plant |
| NFR-6 | Scalability | Increasing theprediction of thedisease in the leaf |

# 5 PROJECT DESIGN

## 5.1 Data Flow Diagrams



### 5.2 Solution & Technical Architecture

From this technical architecture and solution the user can take the pictureof an image and the image will be processing the data the train data and test dataare should be using in AI algorithm .The evaluated image could be predict the diseaseand gives an solution for the attacked leaf .

### 5.3 User Stories

The user can register in the account and may use mail id and password to sss the page and make usefulfor farmers. The image can be processedand data should beheld by it. If you predict the images can be taken an photo and predict button should be made. Then the prediction will appear. If the leaf is healthy it shows healthy. If the leaf isnot healthy it shoes the prediction for fertilizer.

## 6.PROJECT PLANNING &SCHEDULING

### 6.1 Sprint Planning & Estimation

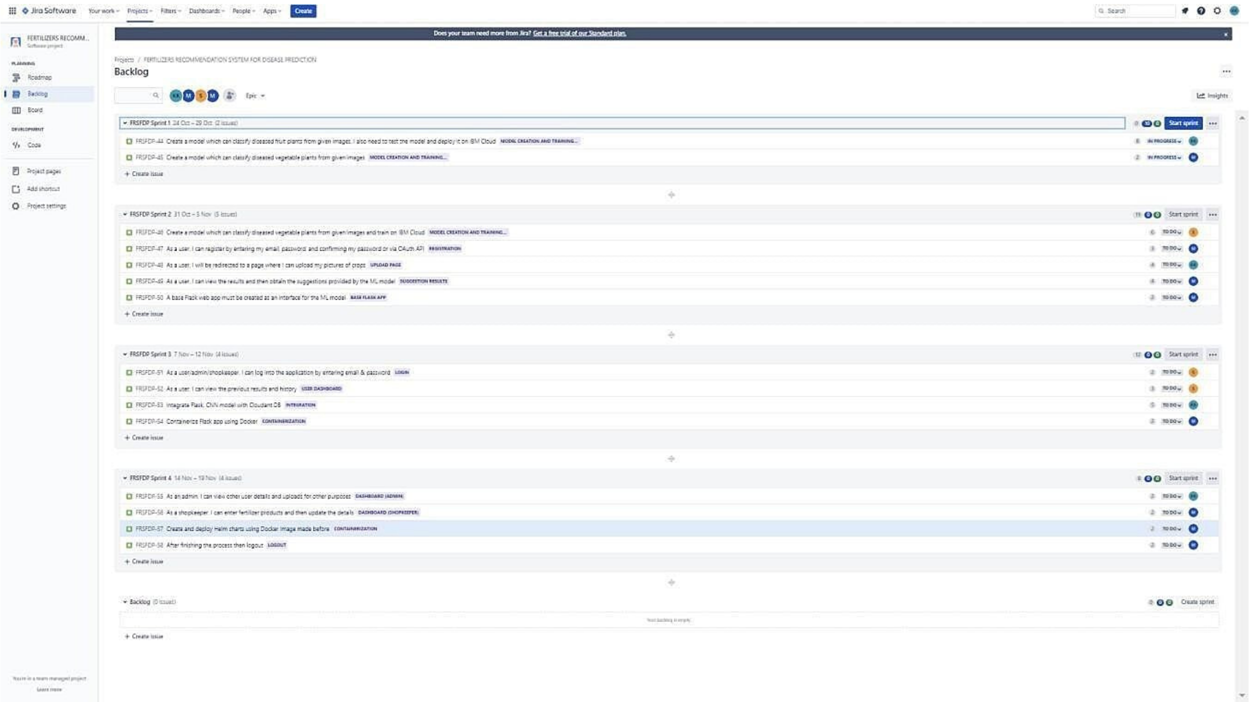
| Sprint | Functional Requirement (Epic) | User StoryNumber | User Story / Task | Story Points (Total) | Priority | Team Members |
|---|---|---|---|---|---|---|
| Sprint-1 | Model Creation and Training (Fruits) | FRSFDP-44 | Create a model which | 8 | High | Kavi Bharath, Manoj, Jagadhessh, Kavimani |

|  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
|  |  |  | can classify diseased fruitplants from given images. I also needto test themodel and deploy it on IBM Cloud |  |  |  |
|  | Model Creation and Training (Vegetables) | FRSFDP-45 | Create a modelwhich can classify diseased vegetable plants from given images | 2 | Medium | Kavi Bharath, Manoj, Jagadhessh, Kavimani |

|  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
| Sprint-2 | Model Creationand Training (Vegetables) | FRSFDP-46 | Create a model which can classify diseased vegetable plants from given images and train onIBMCloud | 6 | High | Kavi Bharath, Manoj, Jagadhessh, Kavimani |
|  | Registration | FRSFDP-47 | As a user, I can register by entering my email, password, and confirming | 3 | High | Kavi Bharath, Manoj, Jagadhessh, Kavimani |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | my passwordor viaOAuth API | | | |
| | Upload page | FRSFDP-48 | As a user,I will be redirected to a page where Ican uploadmy pictures of crops | 4 | High | Kavi Bharath, Manoj, Jagadhessh, Kavimani |
| | Suggestion results | FRSFDP-49 | As a user,I can view the results and then obtain the suggestions provided by the ML model | 4 | High | Kavi Bharath, Manoj, Jagadhessh, Kavimani |
| | Base Flask App | FRSFDP-50 | A base Flask web appmust be created as an interface for the ML model | 2 | High | Kavi Bharath, Manoj, Jagadhessh, Kavimani |
| Sprint-3 | Login | FRSFDP-51 | As a user/admin /shopkeeper, I can log into the application by entering email &password | 2 | High | Kavi Bharath, Manoj, Jagadhessh, Kavimani |
| | User Dashboard | FRSFDP-52 | As a user,I can view the previous results and history | 3 | Medium | JKavi Bharath, Manoj, Jagadhessh, Kavimani |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Integration | FRSFDP-53 | Integrate Flask, CNN model with Cloudant DB | 5 | Medium | Kavi Bharath, Manoj, Jagadhessh, Kavimani |
| | Containerization | FRSFDP-54 | Containerize Flask appusing Docker | 2 | Low | Kavi Bharath, Manoj, Jagadhessh, Kavimani |
| Sprint-4 | Dashboard (Admin) | FRSFDP-55 | As an admin, I can viewother user details and uploads for other purposes | 2 | Medium | Kavi Bharath, Manoj, Jagadhessh, Kavimani |
| | Dashboard (Shopkeeper) | FRSFDP-56 | As a shopkeeper, I canenter fertilizer products and then update the details | 2 | Low | Kavi Bharath, Manoj, Jagadhessh, Kavimani |
| | Containerization | FRSFDP-57 | Create and deploy Helm charts using Docker Imagemade before | 2 | Low | Kavi Bharath, Manoj, Jagadhessh, Kavimani |
| | Logout | FRSFDP-58 | After finishing the process then logout | 2 | Low | Kavi Bharath, Manoj, Jagadhessh, Kavimani |



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Projects / FERTILIZERS RECOMMENDATION SYSTEM FOR DISEASE PREDICTION

Backlog

FRSFDP Sprint 1 24 Oct – 29 Oct (2 issues) 0 10 0

- FRSFDP-44 Create a model which can classify diseased fruit plants from given images. I also need to test the model and deploy it on IBM Cloud MODEL CREATION AND TRAINING... 8 IN PROGRESS
- FRSFDP-45 Create a model which can classify diseased vegetable plants from given images MODEL CREATION AND TRAINING... 2 IN PROGRESS
- + Create issue

FRSFDP Sprint 2 31 Oct – 5 Nov (5 issues) 19 0 0

- FRSFDP-46 Create a model which can classify diseased vegetable plants from given images and train on IBM Cloud MODEL CREATION AND TRAINING... 6 TO DO
- FRSFDP-47 As a user, I can register by entering my email, password and confirming my password or via OAuth API REGISTRATION 3 TO DO
- FRSFDP-48 As a user, I will be redirected to a page where I can upload my pictures of crops UPLOAD PAGE 4 TO DO
- FRSFDP-49 As a user, I can view the results and then obtain the suggestions provided by the ML model SUGGESTION RESULTS 4 TO DO
- FRSFDP-50 A base Flask web app must be created as an interface for the ML model BASE FLASK APP 2 TO DO
- + Create issue

FRSFDP Sprint 3 7 Nov – 12 Nov (4 issues) 12 0 0

- FRSFDP-51 As a user/admin/shopkeeper, I can log into the application by entering email & password LOGIN 2 TO DO
- FRSFDP-52 As a user, I can view the previous results and history USER DASHBOARD 3 TO DO
- FRSFDP-53 Integrate Flask, CNN model with Cloudant DB INTEGRATION 5 TO DO
- FRSFDP-54 Containerize Flask app using Docker CONTAINERIZATION 2 TO DO
- + Create issue

FRSFDP Sprint 4 14 Nov – 19 Nov (4 issues) 8 0 0

- FRSFDP-55 As an admin, I can view other user details and uploads for other purposes DASHBOARD (ADMIN) 2 TO DO
- FRSFDP-56 As a shopkeeper, I can enter fertilizer products and then update the details DASHBOARD (SHOPKEEPER) 2 TO DO
- FRSFDP-57 Create and deploy Helm charts using Docker image made before CONTAINERIZATION 2 TO DO
- FRSFDP-58 After finishing the process then logout LOGOUT 2 TO DO
- + Create issue

Backlog (0 issues) 0 0 0

Your backlog is empty.

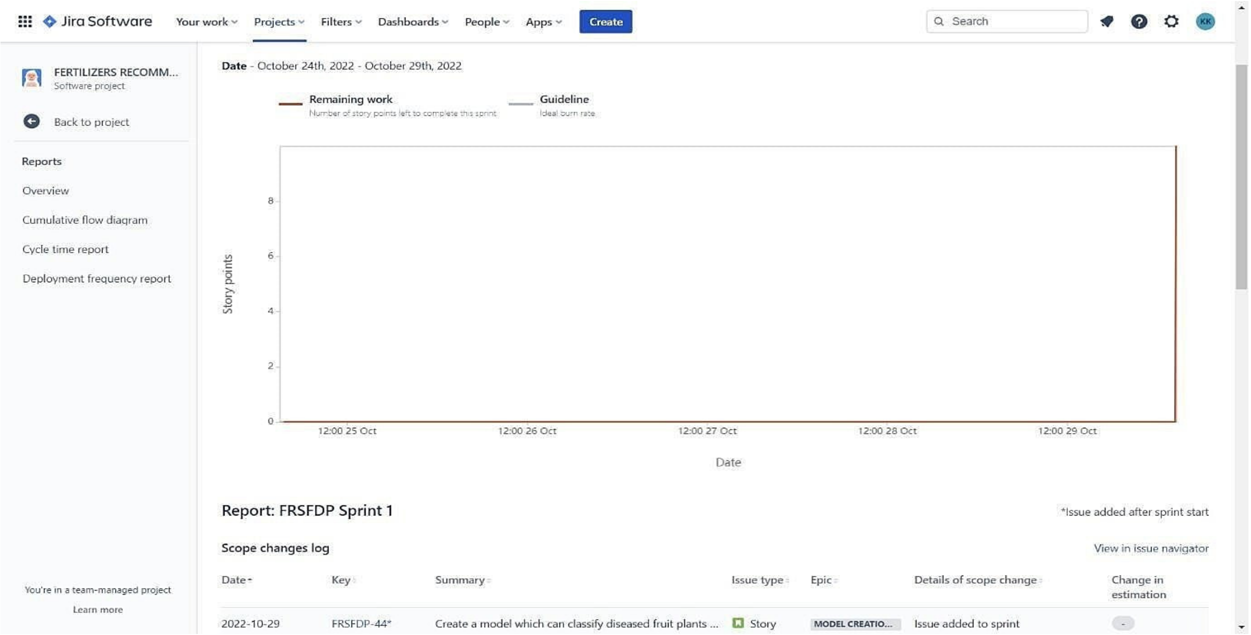
+ Create issue

## 6.2 Sprint Delivery Schedule

| Sprint | Total Story Points | Duration | Sprint Start Date | Sprint EndDate (Planned) | Story Points Completed (as on Planned End Date) | SprintRelease Date (Actual) |
|---|---|---|---|---|---|---|
| Sprint-1 | 10 | 6 Days | 24 Oct 2022 | 29 Oct 2022 | 10 | 30 Oct 2022 |
| Sprint-2 | 15 | 6 Days | 31 Oct 2022 | 05 Nov 2022 | 15 | 06 Nov 2022 |
| Sprint-3 | 15 | 6 Days | 07 Nov 2022 | 12 Nov 2022 | 15 | 13 Nov 2022 |
| Sprint-4 | 12 | 6 Days | 14 Nov 2022 | 19 Nov 2022 | 10 | 20 Nov 2022 |

# BURNDOWN CHART

A burn down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However burn down charts can be applied to anyproject containing measurableprogress over time.



**Date** - October 24th, 2022 - October 29th, 2022

Report: FRSFDP Sprint 1

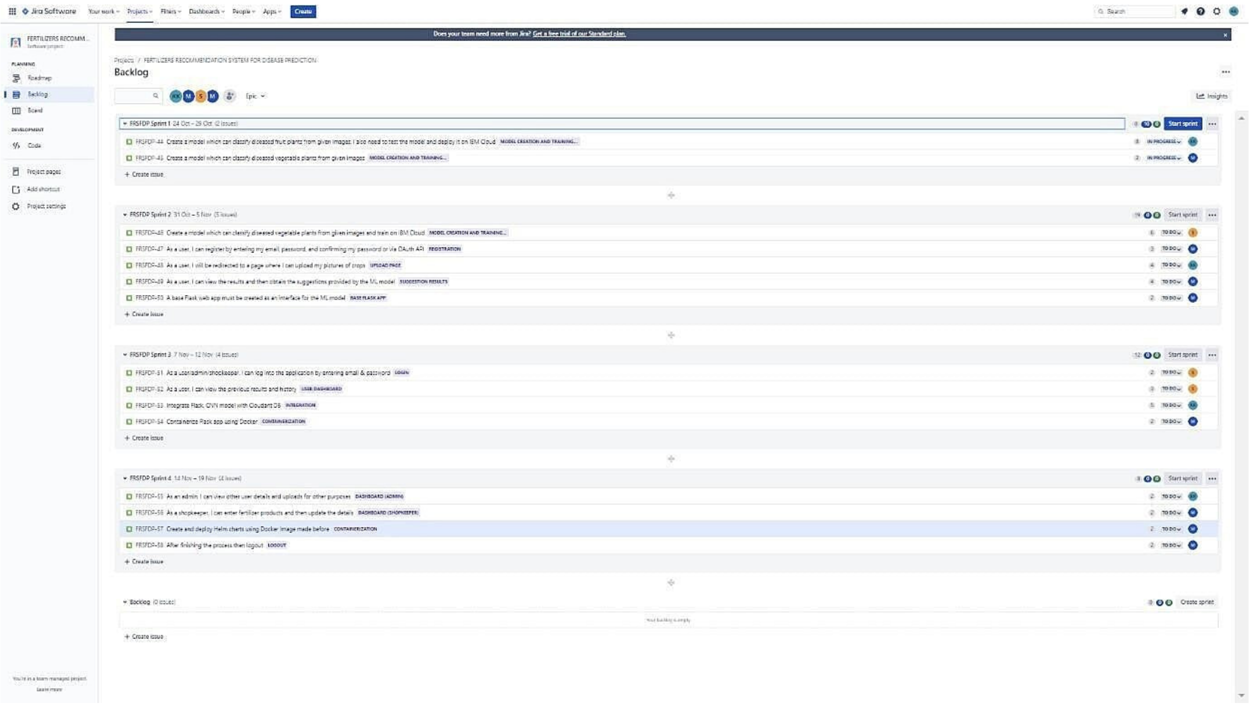
*Issue added after sprint start

Scope changes log

| Date | Key | Summary | Issue type | Epic | Details of scope change | Change in estimation |
|---|---|---|---|---|---|---|
| 2022-10-29 | FRSFDP-44* | Create a model which can classify diseased fruit plants ... | Story | MODEL CREATIO... | Issue added to sprint | - |

## 6.3 Reports from JIRA

### ACTIVITY LIST



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Projects / FERTILIZERS RECOMMENDATION SYSTEM FOR DISEASE PREDICTION

Backlog

FRSFDP Sprint 1 24 Oct – 29 Oct (2 issues) 0 10 0

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+ Create issue

FRSFDP Sprint 2 31 Oct – 5 Nov (5 issues) 19 0 0

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+ Create issue

FRSFDP Sprint 3 7 Nov – 12 Nov (4 issues) 12 0 0

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- FRSFDP-54 Containerize Flask app using Docker CONTAINERIZATION 2 TO DO

+ Create issue

FRSFDP Sprint 4 14 Nov – 19 Nov (4 issues) 8 0 0

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- FRSFDP-56 As a shopkeeper, I can enter fertilizer products and then update the details DASHBOARD (SHOPKEEPER) 2 TO DO
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- FRSFDP-58 After finishing the process then logout LOGOUT 2 TO DO

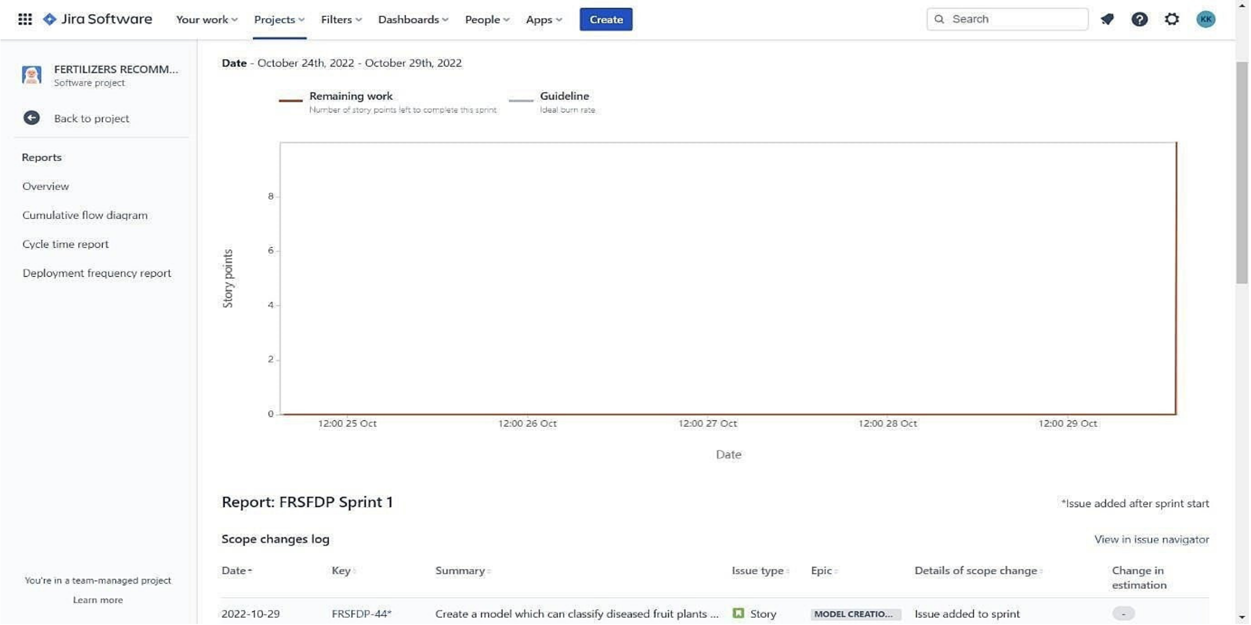
+ Create issue

Backlog (0 issues) 0 0 0

Your backlog is empty

+ Create issue

### BURNDOWNCHART



**Date** - October 24th, 2022 - October 29th, 2022

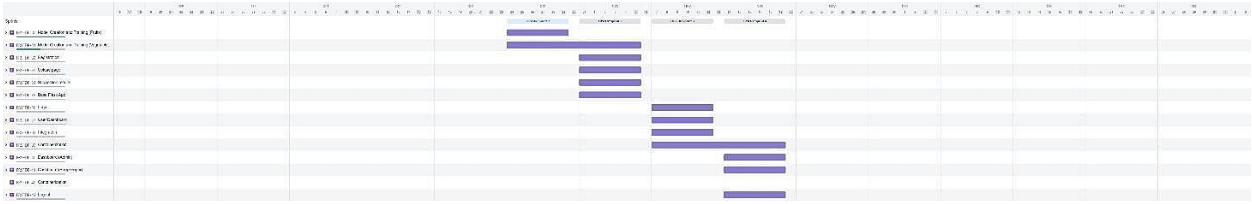
Report: FRSFDP Sprint 1

*Issue added after sprint start

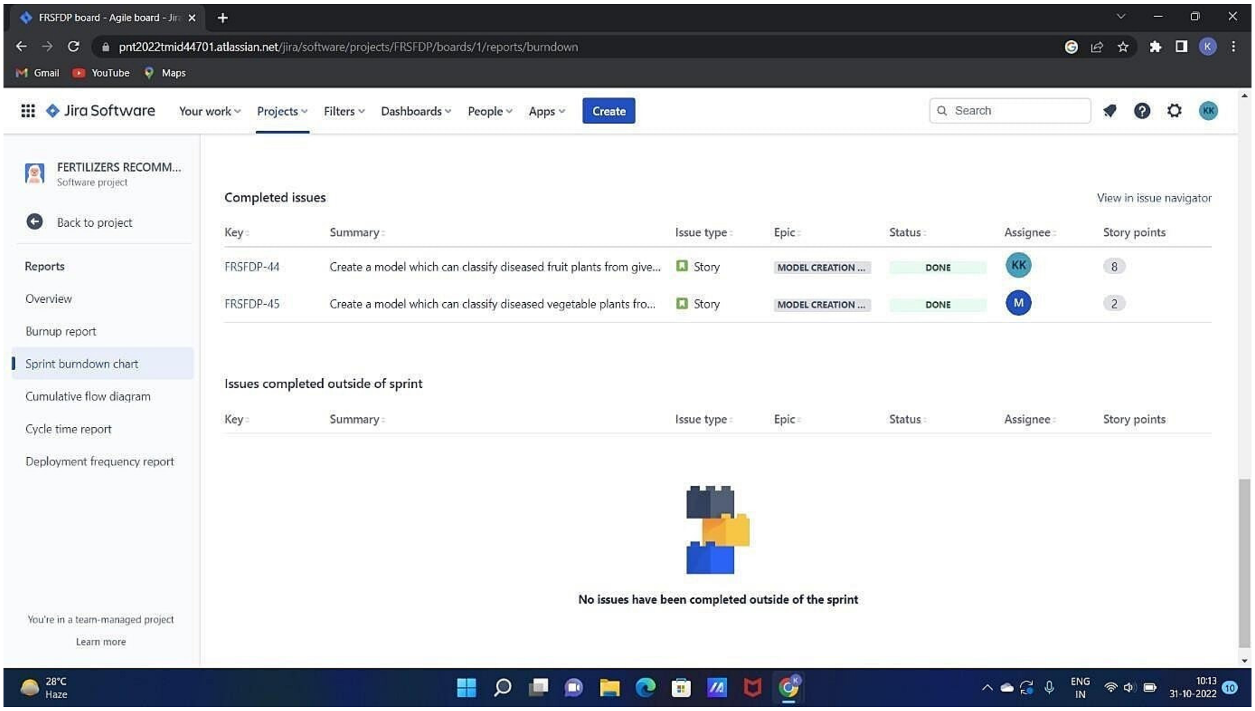
Scope changes log

| Date | Key | Summary | Issue type | Epic | Details of scope change | Change in estimation |
|---|---|---|---|---|---|---|
| 2022-10-29 | FRSFDP-44* | Create a model which can classify diseased fruit plants ... | Story | MODEL CREATIO... | Issue added to sprint | - |

# ROAD MAP



# SPRINT BURNDOWNCHART



Completed issues

| Key | Summary | Issue type | Epic | Status | Assignee | Story points |
|---|---|---|---|---|---|---|
| FRSFDP-44 | Create a model which can classify diseased fruit plants from give... | Story | MODEL CREATION ... | DONE | KK | 8 |
| FRSFDP-45 | Create a model which can classify diseased vegetable plants fro... | Story | MODEL CREATION ... | DONE | M | 2 |

Issues completed outside of sprint

| Key | Summary | Issue type | Epic | Status | Assignee | Story points |
|---|---|---|---|---|---|---|

No issues have been completed outside of the sprint

## 7. CODING & SOLUTIONING (Explain the featuresadded in the project along with code)

### 7.3 Feature 1

```
 <!DOCTYPE html>
<html >

<head>
  <meta charset="UTF-8">
  <meta  name="viewport"  content="width=device-width,  initial-
  scale=1">
  <title> Plant Disease Prediction</title>
  <link href='https://fonts.googleapis.com/css?family=Pacifico'
rel='stylesheet'type='text/css'>
<link href='https://fonts.googleapis.com/css?family=Arimo'
rel='stylesheet'type='text/css'>
<link
href='https://fonts.googleapis.com/css?family=Hind:30
0' rel='stylesheet'type='text/css'>
<link
href='https://fonts.googleapis.com/css?family=Open+Sans+Con
densed:300' rel='stylesheet' type='text/css'>
<link rel="stylesheet" href="{{ url_for('static', filename='css/style.css')
}}">
<link href='https://fonts.googleapis.com/css?family=Merriweather'
rel='stylesheet'>
<link  href='https://fonts.googleapis.com/css?family=Josefin  Sans'
rel='stylesheet'>
```

```
<link  href='https://fonts.googleapis.com/css?family=Montserrat'
rel='stylesheet'>
<style>
.header {
        top:0;
         margin:0px;
         left: 0px;
        right: 0px;
        position: fixed;
        background-color: #28272c;
        color: white;
        box-shadow: 0px 8px 4px grey;
         overflow: hidden;
        padding-left:20px;
        font-family: 'Josefin Sans';
        font-size: 2vw;
        width: 100%;
         height:8%;
        text-align: center;
        }

        topnav {

        overflow: hidden;
        background-color: #333;
        }
        .topnav-right a {
         float: left;
         color: #f2f2f2;
        text-align: center;
         padding: 14px 16px;
        text-decoration: none;
```

```
font-size: 18px;
}

.topnav-right a:hover {
background-color: #ddd;
color: black;
}

.topnav-right a.active {
background-color: #565961;
 color: white;
}

.topnav-right {
 float: right;
padding-right:100px;
}

body {

background-color:#ffffff;
 background-repeat: no-repeat;
 background-size:cover;
background-position: 0px 0px;
}
.button {
background-color: #28272c;
 border: none;
color: white;
 padding: 15px 32px;
 text-align: center;
text-decoration: none;
```

```
display: inline-block;
font-size: 16px;
 border-radius: 12px;
}
.button:hover {
box-shadow: 0 12px 16px 0 rgba(0,0,0,0.24), 0 17px 50px 0 rgba(0,0,0,0.19);
}
form {border: 3px solid #f1f1f1;
margin-left:400px;
margin-right:400px;
}

input[type=text], input[type=password] {
 width: 100%;
padding: 12px 20px;
 display: inline-block;
 margin-bottom:18px;
 border: 1px solid #ccc;
 box-sizing: border-box;
}

button {
background-color: #28272c;
 color: white;
padding: 14px 20px;
margin-bottom:8px;
 border: none; cursor: pointer; width: 15%;
border-radius:4px;
}

button:hover {
 opacity: 0.8;
}

.cancelbtn { width: auto;
padding: 10px 18px;
 background-color: #f44336;
}

.imgcontainer {
text-align: center;
margin: 24px 0 12px 0;
}

img.avatar {
 width: 30%;
border-radius: 50%;
}

.container {
 padding: 16px;
}

span.psw {
float: right;
padding-top: 16px;
}

/* Change styles for span and cancel button on extra small
screens */ @media screen and (max-width: 300px) {
span.psw {
 display: block; float: none;
}
```

```
.cancelbtn {
 width: 100%;
}
}

.home{
margin:80px;

width: 84%;
height: 500px;
 padding-top:10px;
 padding-left: 30px;


}
.login{
margin:80px;
box-sizing: content-box;
width: 84%;
 height: 420px;
 padding: 30px;
border: 10px solid blue;
}
.left,.right{
box-sizing: content-box;
 height: 400px;
margin:20px;
border: 10px solid blue;
}

.mySlides {display: none;} img {
vertical-align: middle;
```

```
}


/* Slideshow container */
.slideshow-container {
 max-width: 1000px;
position: relative;
 margin: auto;
}

/* Caption text */
.text {
color: #f2f2f2;
 font-size: 15px;
padding: 8px 12px;
position: absolute;
 bottom: 8px;
 width: 100%;
text-align: center;
}
/* The dots/bullets/indicators */
.dot {
height: 15px;
width: 15px;
 margin: 0 2px;
background-color: #bbb;
 border-radius: 50%;
 display: inline-block;
transition: background-color 0.6s ease;
}
.active {
background-color: #717171;
```

```
}

/* Fading animation */
.fade {

-webkit-animation-name: fade;
-webkit-animation-duration: 1.5s;
 animation-name: fade;
animation-duration: 1.5s;
}

@-webkit-keyframes fade { from {opacity: .4}
to {opacity: 1}
}

@keyframes fade { from {opacity: .4}
to {opacity: 1}
}

/* On smaller screens, decrease text size */ @media only
screen and (max-width: 300px) {
.text {font-size: 11px}
}
</style>
</head>

<body style="font-family:'Times New Roman', Times,
serif;background- color:#C2C5A8;">

<div class="header">
<div style="width:50%;float:left;font-size:2vw;text-
align:left;color:white; padding- top:1%">Plant Disease
```

```
Prediction</div>
<div class="topnav-right"style="padding-top:0.5%;">

<a class="active" href="{{ url_for('home')}}">Home</a>
<a href="{{ url_for('prediction')}}">Predict</a>
</div>
</div>

<div style="background-color:#ffffff;">
<div style="width:60%;float:left;">
<div style="font-size:50px;font-family:Montserrat;padding-
left:20px;text- align:center;padding-top:10%;">
<b>Detect if your plant<br> is infected!!</b></div><br>
<div style="font-size:20px;font-family:Montserrat;padding-
left:70px;padding- right:30px;text-align:justify;">

Agriculture is one of the major sectors worls wide. Over
the years it has developed and the use of new technologies
and equipment replaced almost all the traditional methods
of farming. The plant diseases effect the production.
Identification of diseases and taking necessary
precautions is all done through naked eye, which requires
labour and laboratries. This application helps farmers in
detecting the diseases by observing the spots on the
leaves, which inturn saves effort and labor costs
.</div><br><br>
</div>
</div>
<div style="width:40%;float:right;"><br><br>
<img src="{{url_for('static',filename='images/12456.png')}}"
style="max- height:100%;max-width:100%;">
```

```
</div>
</div>

<div class="home">

<br>

</div>

<script>
var slideIndex = 0; showSlides();

function showSlides() { var i;
var slides =
document.getElementsByClassName("mySlides"); var dots
= document.getElementsByClassName("dot");
for (i = 0; i < slides.length; i++) { slides[i].style.display =
"none";
}
slideIndex++;
if (slideIndex > slides.length) {slideIndex = 1} for (i = 0; i <
dots.length; i++) {
dots[i].className = dots[i].className.replace(" active", "");
}
slides[slideIndex-1].style.display = "block"; dots[slideIndex-
1].className += " active";
setTimeout(showSlides, 2000); // Change image every 2
seconds
}
</script>
</body>
```

```
</html>

<!DOCTYPE html>
<html >
<head>
<meta charset="UTF-8">
<meta name="viewport" content="width=device-width,
initial-scale=1">
<title> Plant Disease Prediction</title>
<link
href='https://fonts.googleapis.com/css?family=Pacifico'
rel='stylesheet' type='text/css'>
<link href='https://fonts.googleapis.com/css?family=Arimo'
rel='stylesheet' type='text/css'>
<link
href='https://fonts.googleapis.com/css?family=Hind:300'
rel='stylesheet' type='text/css'>
<link
href="https://cdn.bootcss.com/bootstrap/4.0.0/css/bootst
rap.min.css" rel="stylesheet">
<script
src="https://cdn.bootcss.com/popper.js/1.12.9/umd/popp
er.min.js"></script>
<script
src="https://cdn.bootcss.com/jquery/3.3.1/jquery.min.js">
</script>
<script
src="https://cdn.bootcss.com/bootstrap/4.0.0/js/bootstra
p.min.js"></script>
<link
href='https://fonts.googleapis.com/css?family=Open+Sans
+Condensed:300' rel='stylesheet' type='text/css'>
```

```
<link
href='https://fonts.googleapis.com/css?family=Merriweath
er' rel='stylesheet'>
<link
href='https://fonts.googleapis.com/css?family=Josefin
Sans' rel='stylesheet'>
<link
href='https://fonts.googleapis.com/css?family=Montserrat'
rel='stylesheet'>
<link href="{{ url_for('static', filename='css/final.css') }}"
rel="stylesheet">
<style>
.header {
top:0; margin:0px; left: 0px; right: 0px;
position: fixed;
background-color: #28272c; color: white;
box-shadow: 0px 8px 4px grey; overflow: hidden;
padding-left:20px;
font-family: 'Josefin Sans'; font-size: 2vw;
width: 100%; height:8%;
text-align: center;
}
.topnav { overflow: hidden; background-color: #333;
}

.topnav-right a { float: left; color: #f2f2f2;
text-align: center; padding: 14px 16px; text-decoration:
none; font-size: 18px;
}


.topnav-right a:hover { background-color: #ddd; color: black;
```

```css
}

.topnav-right a.active { background-color: #565961; color:
white;
}

.topnav-right { float: right;
padding-right:100px;
}

.login{
margin-top:-70px;
}
body {

background-color:#ffffff; background-repeat: no-repeat;
background-size:cover; background-position: 0px 0px;
}
.login{
margin-top:100px;
}

.container { margin-top:40px; padding: 16px;
}
select {
width: 100%;
margin-bottom: 10px;
background: rgba(255,255,255,255); border: none;
outline: none; padding: 10px; font-size: 13px; color:
#000000;
text-shadow: 1px 1px 1px rgba(0,0,0,0.3); border: 1px solid
rgba(0,0,0,0.3);
```

```
border-radius: 4px;
box-shadow: inset 0 -5px 45px rgba(100,100,100,0.2), 0 1px 1px rgba(255,255,255,0.2);
-webkit-transition: box-shadow .5s ease;
-moz-transition: box-shadow .5s ease;
-o-transition: box-shadow .5s ease;
-ms-transition: box-shadow .5s ease; transition: box-shadow .5s ease;

}

</style>
</head>

<body style="font-family:Montserrat;overflow:scroll;">

<div class="header">
<div style="width:50%;float:left;font-size:2vw;text-align:left;color:white; padding-top:1%">Plant Disease Prediction</div>
<div class="topnav-right" style="padding-top:0.5%;">

</div>
</div>
<div class="container">
<div id="content" style="margin-top:2em">
<div class="container">
<div class="row">
<div class="col-sm-6 bd" >

<br>
<img src="{{url_for('static',filename='images/789.jpg')}}"
```

```
style="height:450px;width:550px"class="img-rounded"
alt="Gesture">
</div>
<div class="col-sm-6">
<div>


data">

<h4>Drop in the image to get the prediction </h4>
<form action = "" id="upload-file" method="post"
enctype="multipart/form-

<select name="plant">

<option value="select" selected>Select plant type</option>
<option value="fruit">Fruit</option>
<option value="vegetable">Vegetable</option>


#28272c;">


.jpg, .jpeg">

</select><br>
<label for="imageUpload" class="upload-label"
style="background:

Choose...
</label>
<input type="file" name="image" id="imageUpload"
```

```
accept=".png,

</form>

<div class="image-section" style="display:none;">
<div class="img-preview">
<div id="imagePreview">
</div>

</div>
<div>

<button type="button" class="btn btn-info btn-lg " id="btn-predict" style="background: #28272c;">Predict!</button>
</div>
</div>
<div class="loader" style="display:none;"></div>
<h3>
</div>
</h3>
</div>
<span id="result" style="font-size:17px; "> </span>
</div>
</body>
<footer>
</div>
</div>
</div>
<script src="{{ url_for('static', filename='js/main.js') }}" type="text/javascript"></script>
</footer>
</html>
```

## 7.2 Feature 2

```
import requests
from tensorflow.keras.preprocessing import image
 from tensorflow.keras.model
s import load_model
 import numpy as np
import pandas as pd
import tensorflow as tf
from flask import Flask, request, render_template, redirect, url_for
 import os
from werkzeug.utils import secure_filename
from tensorflow.python.keras.backend import set_session
 app = Flask( name )
#load both the vegetable and fruit models
model = load_model("vegetable.h5")
 model1=load_model("fruit.h5")

#home page
 @app.route('/')
def home():
return render_template('home.html')
#prediction page
@app.route('/prediction')

def prediction():

return render_template('predict.html')

@app.route('/predict',methods=['POST'])
def predict():
if request.method == 'POST':
# Get the file from post request
 f = request.files['image']

# Save the file to ./uploads
 basepath = os.path.dirname( file )
 file_path = os.path.join(
basepath, 'uploads', secure_filename(f.filename))
```

```
 f.save(file_path)
img = image.load_img(file_path, target_size=(128, 128))

x = image.img_to_array(img)
 x = np.expand_dims(x, axis=0)

plant=request.form['plant']
print(plant)
if(plant=="vegetable"):
preds = model.predict(x)
 preds=np.argmax(preds)
 print(preds)
df=pd.read_excel('precautions - veg.xlsx')
 print(df.iloc[preds]['caution'])
else:
preds = model1.predict(x)
preds=np.argmax(preds)
 df=pd.read_excel('precautions - fruits.xlsx')
 print(df.iloc[preds]['caution'])

return df.iloc[preds]['caution']
if name == " main ":
app.run(debug=False)
```

# 8. TESTING

## 8.1 Test Cases

| SECTION | TOTAL CASES | NOT TESTED | FAIL | PASS |
|---|---|---|---|---|
| Leafspots | 17 | 0 | 0 | 17 |

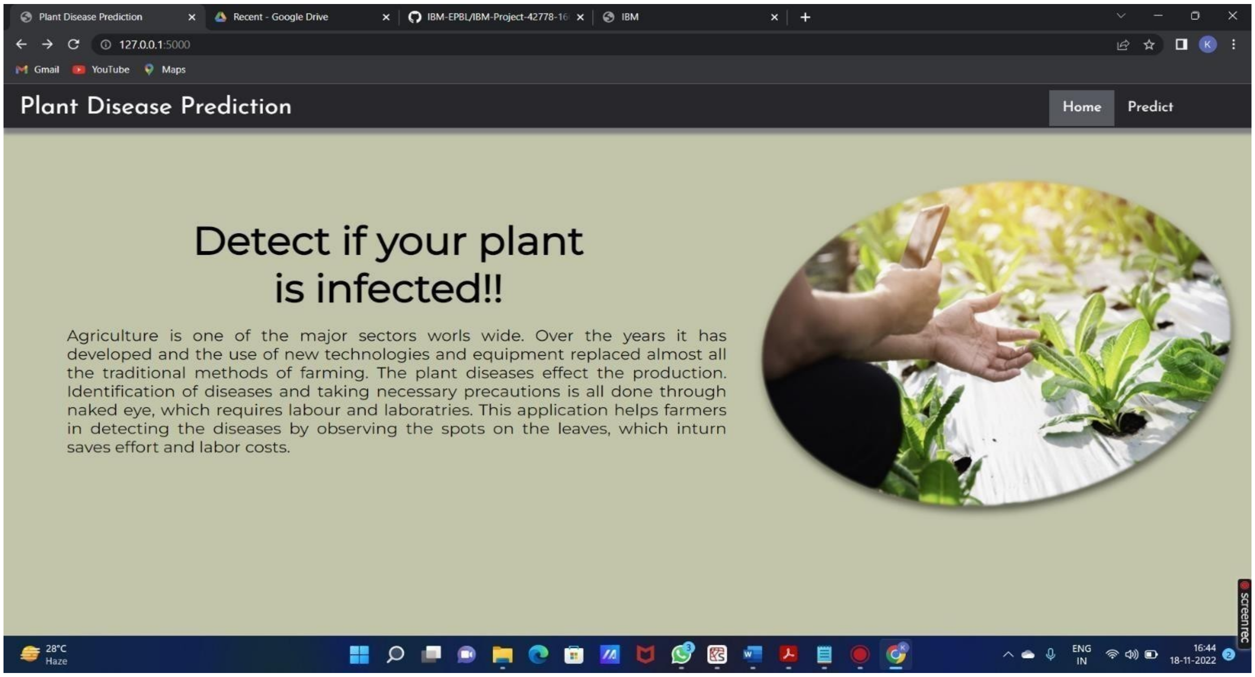
| | | | | |
|---|---|---|---|---|
| Mosaic Leaf Pattern | 51 | 0 | 0 | 51 |
| MisshapenLeaves | 20 | 0 | 0 | 20 |
| Yellow Leaves | 7 | 0 | 0 | 7 |
| FruitRots | 9 | 0 | 0 | 9 |
| FruitSpots | 4 | 0 | 0 | 4 |
| Blights | 2 | 0 | 0 | 2 |

8.2 User Acceptance Testing

| **RESOLUTION** | **SEVERITY 1** | **SEVERITY 2** | **SEVERITY 3** | **SEVERITY 4** | **SUBTOTAL** |
|---|---|---|---|---|---|
| Leafspots | 10 | 4 | 2 | 3 | 19 |
| MosaicLeafPattern | 9 | 6 | 3 | 6 | 24 |
| MisshapenLeaves | 2 | 7 | 0 | 1 | 10 |
| YellowLeaves | 11 | 4 | 3 | 20 | 38 |
| FruitRots | 3 | 2 | 1 | 0 | 6 |
| FruitSpots | 5 | 3 | 1 | 1 | 10 |
| Blights | 4 | 5 | 2 | 1 | 12 |
| Totals | 44 | 31 | 13 | 32 | 119 |

# 9. RESULTS

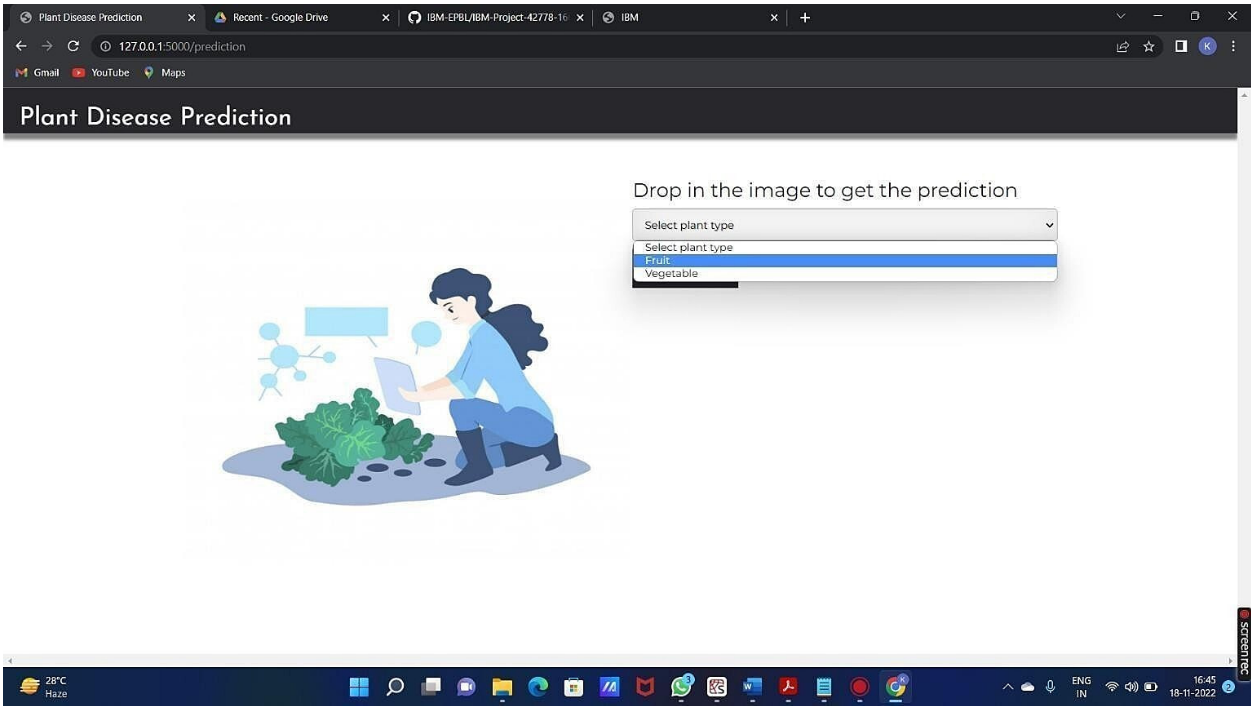
## 9.1 Performance Metrics



Plant Disease Prediction

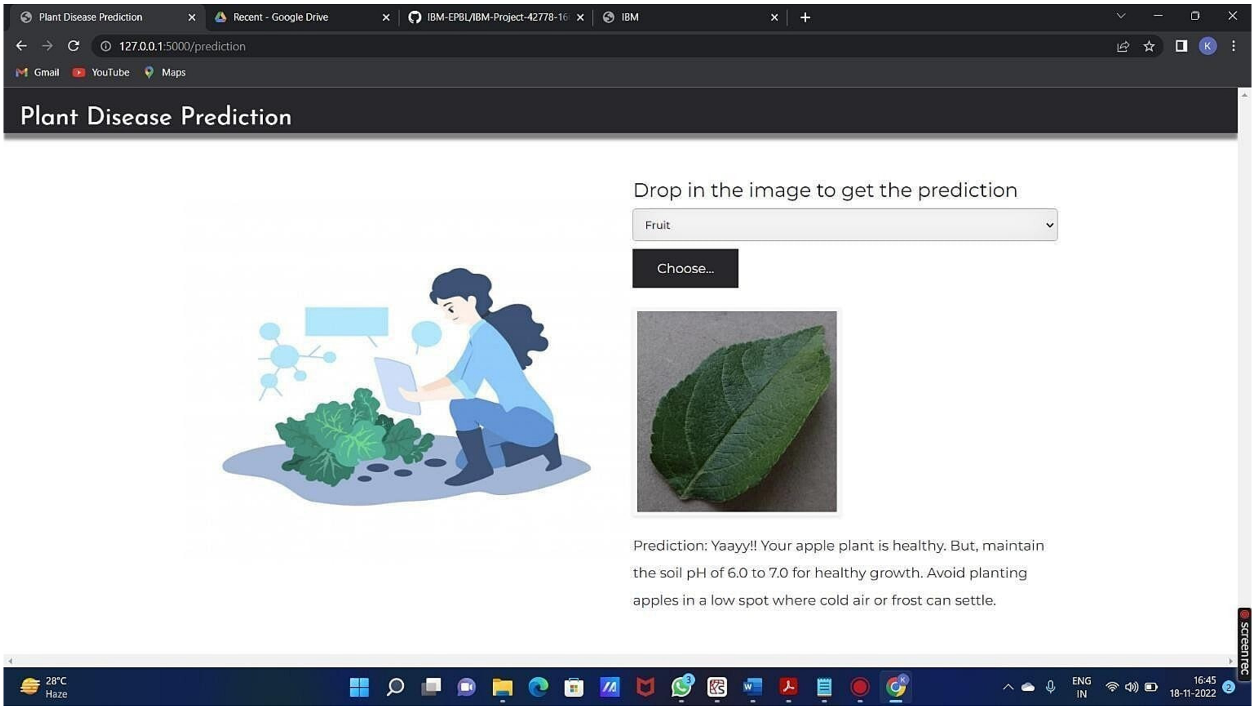
Detect if your plant is infected!!

Agriculture is one of the major sectors worls wide. Over the years it has developed and the use of new technologies and equipment replaced almost all the traditional methods of farming. The plant diseases effect the production. Identification of diseases and taking necessary precautions is all done through naked eye, which requires labour and laboratries. This application helps farmers in detecting the diseases by observing the spots on the leaves, which inturn saves effort and labor costs.



Plant Disease Prediction

Drop in the image to get the prediction

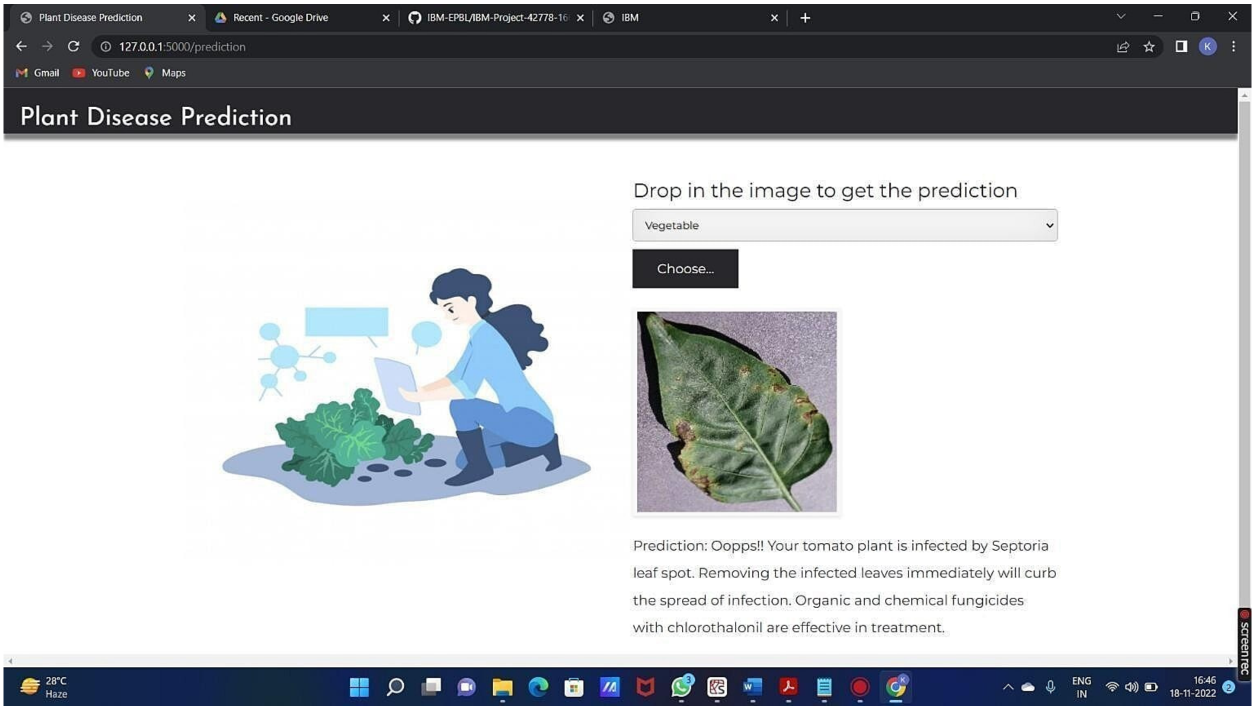


Plant Disease Prediction

Drop in the image to get the prediction

Fruit

Prediction: Yaayy!! Your apple plant is healthy. But, maintain the soil pH of 6.0 to 7.0 for healthy growth. Avoid planting apples in a low spot where cold air or frost can settle.



Plant Disease Prediction

Drop in the image to get the prediction

Vegetable

Choose...

Prediction: Oopps!! Your tomato plant is infected by Septoria leaf spot. Removing the infected leaves immediately will curb the spread of infection. Organic and chemical fungicides with chlorothalonil are effective in treatment.

## 10. ADVANTAGES & DISADVANTAGES

List of advantages

1. The proposed model here produces very high accuracyof classification.
2. Very large datasets can also be trained and tested.
3. Images of very high can be resized withinthe proposed itself.

List of disadvantages

1. For trainingand testing, the proposed model requires very high computational time.
2. The neuralnetwork architecture used in this project work has high complexity.

## 11. CONCLUSION

The model proposedhere involves image classification of fruit datasetsand vegetabledatasets. The following points are observedduring model testing and training:

1. The accuracyof classification increasedby increasing the number of epochs.
2. For differentbatch sizes, different classification accuracies are obtained.

3. The accuracies are increased by increasing more convolution layers.
4. The accuracyof classification also increased by varying dense layers.
5. Different accuracies are obtainedby varying the size of kernel used in the convolutionlayeroutput.
6. Accuracies are different while varying the size of the trainand test datasets.

## 12. FUTURE SCOPE

The proposed model in this project work can be extended to image recognition. The entire model can be converted to application software using python to exe software. Thereal time image classification, image recognition and video processing are possible with help OpenCV pythonlibrary. This projectwork can be extended for security applicationssuch as figure print recognition, iris recognition and face recognition.

## 13. APPENDIX

## Source Code

```
import requests
from
tensorflow.keras.p
reprocessing
 import image
from
tensorflow.keras.
models
 import
load_model import
numpy as np
import pandas as
pd
import tensorflow
as tf
from flask import
Flask, request,
render_template,
redirect, url_for
 import os
from
werkzeug.utils
import
secure_filename
from
tensorflow.python.
keras.backend
import
```

```
set_session app =
Flask(    name)
#load both the
vegetable and fruit
models
model =
load_model("veget
able.h5")
model1=load_mod
el("fruit.h5")

#home page

@app.route('/')
def home():
    return
render_template('h
ome.html')

#prediction page

@app.route('/predi
ction')
def prediction():
    return
render_template('p
redict.html')

@app.route('/predi
ct',methods=['POS
T'])
```

```
def predict():
    if
request.method ==
'POST':
# Get the file from
post request
f =
request.files['imag
e']

# Save the file to
./uploads
basepath =
os.path.dirname(_
_file__)
file_path =
os.path.join(
basepath,
'uploads',
secure_filename(f.
filename))
f.save(file_path)
img =
image.load_img(fil
e_path,
target_size=(128,
128))

x =
image.img_to_arra
y(img)
```

```
x =
np.expand_dims(x,
axis=0)

plant=request.for
m['plant']
print(plant)
if(plant=="vegetabl
e"):
    preds =
model.predict(x)

preds=np.argmax(
preds)
     print(preds)

df=pd.read_excel('
precautions -
veg.xlsx')

print(df.iloc[preds]
['caution'])
else:
    preds =
model1.predict(x)

preds=np.argmax(
preds)

df=pd.read_excel('
precautions -
fruits.xlsx')

print(df.iloc[preds]
['caution'])

    return
df.iloc[preds]['cauti
on']

if  name== "
main      ":

app.run(debug=Fal
se)

<!DOCTYPE html>

<html >

<head>
<meta
charset="UTF-8">
<meta
name="viewport"
content="width=de
vice-width, initial-
scale=1">
<title> Plant
Disease
Prediction</title>
<link
```

```
href='https://fonts.
googleapis.com/c
ss?family=Pacific
o' rel='stylesheet'
type='text/css'>
<link
href='https://fonts.
googleapis.com/c
ss?family=Arimo'
rel='stylesheet'
type='text/css'>
<link
href='https://fonts.
googleapis.com/c
ss?family=Hind:30
0' rel='stylesheet'
type='text/css'>
<link
href='https://fonts.
googleapis.com/c
ss?family=Open+S
ans+Condensed:3
00' rel='stylesheet'
type='text/css'>
<link
rel="stylesheet"
href="{{
url_for('static',
filename='css/styl
e.css') }}">
<link
```

```
href='https://fonts.
googleapis.com/c
ss?family=Merriwe
ather'
rel='stylesheet'>
<link
href='https://fonts.
googleapis.com/c
ss?family=Josefin
Sans'
rel='stylesheet'>
<link
href='https://fonts.
googleapis.com/c
ss?family=Montse
rrat'
rel='stylesheet'>
<style>
.header {
      top:0;
    margin:0px;
    left: 0px;
     right: 0px;
      position:
fixed;

background-color:
#28272c;
    color: white;
      box-
shadow: 0px 8px
```

```
4px grey;
            overflow:
hidden;
            padding-
left:20px;
            font-
family: 'Josefin
Sans';
        font-size:
2vw;
            width:
100%; height:8%;
            text-align:
center;
    }
    .topnav {
     overflow:
hidden;
     background-
color: #333;
}

.topnav-right a {
     float: left;
     color: #f2f2f2;
     text-align:
center;
     padding: 14px
16px;
     text-decoration:
none;
```

```
     font-size: 18px;
}

.topnav-right
a:hover {
     background-
color: #ddd;
     color: black;
}

.topnav-right
a.active {
     background-
color: #565961;
     color: white;
}

.topnav-right {
    float: right;
    padding-
right:100px;
}

body {

    background-
color:#ffffff;
     background-
repeat: no-repeat;
     background-
size:cover;
```

```
     background-position: 0px 0px;
}
.button {
    background-color: #28272c;
     border: none;
    color: white;
     padding: 15px 32px;
    text-align: center;
     text-decoration: none;
     display: inline-block;
     font-size: 16px;
     border-radius: 12px;
}
.button:hover {
    box-shadow: 0 12px 16px 0 rgba(0,0,0,0.24), 0 17px 50px 0 rgba(0,0,0,0.19);
}
form {border: 3px solid #f1f1f1; margin-left:400px;margin-
```

```
right:400px;}

input[type=text],
input[type=passwo
rd] {
    width: 100%;
    padding: 12px
20px;
     display: inline-
block;
    margin-
bottom:18px;
    border: 1px
solid #ccc;
    box-sizing:
border-box;
}

button {
    background-
color: #28272c;
     color: white;
    padding: 14px
20px;
     margin-
bottom:8px;
     border: none;
     cursor: pointer;
     width: 15%;
    border-
radius:4px;
```

```
}

button:hover {
    opacity: 0.8;
}

.cancelbtn {
     width: auto;
     padding: 10px
18px;
     background-
color: #f44336;
}

.imgcontainer {
    text-align:
center;
    margin: 24px 0
12px 0;
}

img.avatar {
    width: 30%;
    border-radius:
50%;
}

.container {
    padding: 16px;
}
```

```
span.psw {
     float: right;
     padding-top:
16px;
}

/* Change styles
for span and
cancel button on
extra small
screens */

@media screen
and (max-width:
300px) {
    span.psw {
    display: block;
     float: none;
}
.cancelbtn {
     width: 100%;
}
}

.home{
    margin:80px;
    width: 84%;
height: 500px;
     padding-
top:10px;
     padding-left:
```

```
30px;

}
.login{
   margin:80px;
   box-sizing:
content-box;
    width: 84%;
   height: 420px;
   padding: 30px;
   border: 10px
solid blue;
}
.left,.right{
   box-sizing:
content-box;
   height: 400px;
margin:20px;
   border: 10px
solid blue;
}

.mySlides {display:
none;}
 img {vertical-
align: middle;}

/* Slideshow
container */
.slideshow-
container {
     max-width:
1000px;
     position:
relative;
     margin: auto;
}

/* Caption text */
.text {

    color: #f2f2f2;
    font-size: 15px;
    padding: 8px
12px;
    position:
absolute;
     bottom: 8px;
    width: 100%;
text-align: center;
}
/* The
dots/bullets/indic
ators */
.dot {
    height: 15px;
     width: 15px;
     margin: 0 2px;
    background-
color: #bbb;
     border-radius:
50%;
```

```
     display: inline-block;
    transition: background-color 0.6s ease;
}

.active {
    background-color: #717171;
}

/* Fading animation */
.fade {
    -webkit-animation-name: fade;
    -webkit-animation-duration: 1.5s;
     animation-name: fade;
    animation-duration: 1.5s;
}

@-webkit-keyframes fade {
    from {opacity: .4}
    to {opacity: 1}
}

@keyframes fade {
    from {opacity:
.4}
    to {opacity: 1}
}

/* On smaller
screens, decrease
text size */
@media only
screen and (max-
width: 300px) {
.text {
    font-size: 11px}
}
</style>

</head>

<body style="font-
family:'Times New
Roman', Times,
serif;background-
color:#C2C5A8;">

<div
class="header">
<div
```

```
style="width:50%;
    float:left;
    font-size:2vw;
    text-align:left;
    color:white;
     padding-
top:1%">Plant
Disease
Prediction</div>
<div
class="topnav-
right"style="paddin
g-top:0.5%;">

<a class="active"
href="{{
url_for('home')}}">
Home</a>
<a href="{{
url_for('prediction')
}}">Predict</a>
</div>
</div>

<div
style="backgroun
d-color:#ffffff;">
<div
style="width:60%;fl
oat:left;">
```

```
<div style="font-size:50px;font-family:Montserrat;padding-left:20px;text-align:center;padding-top:10%;"><b>Detect if your plant<br> is infected!!</b></div><br>
<div style="font-size:20px;font-family:Montserrat;padding-left:70px;padding-right:30px;text-align:justify;">Agriculture is one of the major sectors worls wide. Over the years it has developed and the use of new technologies and equipment replaced almost all the traditional methods of farming. The plant diseases effect
```

```
the production.
Identification of
diseases and
taking necessary
precautions is all
done through
naked eye, which
requires labour
and laboratries.
This application
helps farmers in
detecting the
diseases by
observing the
spots on the
leaves, which
inturn saves effort
and labor
costs.</div><br><
br>
</div>
</div>
<div
style="width:40%;fl
oat:right;"><br><b
r>
<img
src="{{url_for('stati
c',filename='image
s/12456.png')}}"
style="max-
```

```
height:100%;max-
width:100%;">

</div>
</div>

<div
class="home">

<br>

</div>

<script>
var slideIndex = 0;
showSlides();


function
showSlides() { var
i;
var slides =
document.getElem
entsByClassName
("mySlides"); var
dots =
document.getElem
entsByClassName
("dot");
for (i = 0; i <
slides.length; i++)
{
slides[i].style.displ
ay = "none";
}
slideIndex++;
if (slideIndex >
slides.length)
{slideIndex = 1} for
(i = 0; i <
dots.length; i++) {
dots[i].className
=
dots[i].className.
replace(" active",
"");
}
slides[slideIndex-
1].style.display =
"block";
dots[slideIndex-
1].className += "
active";
setTimeout(showS
lides, 2000); //
Change image
every 2 seconds
}
</script>
</body>
</html>
```

```
<!DOCTYPE html>
<html >

<head>
<meta
charset="UTF-8">
<meta
name="viewport"
content="width=de
vice-width, initial-
scale=1">
<title> Plant
Disease
Prediction</title>
<link
href='https://fonts.
googleapis.com/c
ss?family=Pacific
o' rel='stylesheet'
type='text/css'>
<link
href='https://fonts.
googleapis.com/c
ss?family=Arimo'
rel='stylesheet'
type='text/css'>
<link
href='https://fonts.
googleapis.com/c
ss?family=Hind:30
```

```
0' rel='stylesheet'
type='text/css'>
<link
href="https://cdn.b
ootcss.com/boots
trap/4.0.0/css/bo
otstrap.min.css"
rel="stylesheet">
<script
src="https://cdn.b
ootcss.com/popp
er.js/1.12.9/umd/p
opper.min.js"></sc
ript>
<script
src="https://cdn.b
ootcss.com/jquery
/3.3.1/jquery.min.j
s"></script>
<script
src="https://cdn.b
ootcss.com/boots
trap/4.0.0/js/boot
strap.min.js"></scr
ipt>
<link
href='https://fonts.
googleapis.com/c
ss?family=Open+S
ans+Condensed:3
00' rel='stylesheet'
```

```
type='text/css'>
<link
href='https://fonts.
googleapis.com/c
ss?family=Merriwe
ather'
rel='stylesheet'>
<link
href='https://fonts.
googleapis.com/c
ss?family=Josefin
Sans'
rel='stylesheet'>
<link
href='https://fonts.
googleapis.com/c
ss?family=Montse
rrat'
rel='stylesheet'>
<link href="{{
url_for('static',
filename='css/final
.css') }}"
rel="stylesheet">

<style>
.header {
    top:0;
     margin:0px;
    left: 0px;
    right: 0px;
    position: fixed;
    background-
color: #28272c;
    color: white;
    box-shadow:
0px 8px 4px grey;
    overflow:
hidden;
    padding-
left:20px;
    font-family:
'Josefin Sans';
    font-size: 2vw;
    width: 100%;
height:8%;
    text-align:
center;

.topnav {
     overflow:
hidden;
     background-
color: #333;
}

.topnav-right a {
    float: left;
    color: #f2f2f2;
    text-align:
center;
     padding: 14px
```

```
16px;
     text-decoration:
none;
     font-size: 18px;
}

.topnav-right
a:hover {
     background-
color: #ddd;
     color: black;
}

.topnav-right
a.active {
    background-
color: #565961;
     color: white;
}

.topnav-right {
     float: right;
     padding-
right:100px;
}

.login{
    margin-top:-
70px;
}
body {
    background-
color:#ffffff;
     background-
repeat: no-repeat;
     background-
size:cover;
     background-
position: 0px 0px;
}
.login{
    margin-
top:100px;
}

.container {
    margin-
top:40px;
    padding: 16px;
}
select {
    width: 100%;
    margin-bottom:
10px;
    background:
rgba(255,255,255,
255);
    border: none;
    outline: none;
    padding: 10px;
     font-size: 13px;
     color:
#000000;
    text-shadow:
1px 1px 1px
rgba(0,0,0,0.3);
    border: 1px
solid
rgba(0,0,0,0.3);
    border-radius:
4px;
    box-shadow:
inset 0 -5px 45px
rgba(100,100,100,
0.2), 0 1px 1px
rgba(255,255,255,
0.2);
    -webkit-
transition: box-
shadow .5s ease;
    -moz-transition:
box-shadow .5s
ease;
    -o-transition:
box-shadow .5s
ease;
    -ms-transition:
box-shadow .5s
ease;
    transition: box-
shadow .5s ease;
}
```

```
</style>
</head>

<body style="font-
family:Montserrat;
overflow:scroll;">

<div
class="header">
<div
style="width:50%;fl
oat:left;font-
size:2vw;text-
align:left;color:whi
te; padding-
top:1%">Plant
Disease
Prediction</div>
<div
class="topnav-
right"
style="padding-
top:0.5%;">


</div>
</div>
<div
class="container">
```

```
<div id="content"
style="margin-
top:2em">
<div
class="container">
<div class="row">
<div class="col-
sm-6 bd" >

<br>
<img
src="{{url_for('stati
c',filename='image
s/789.jpg')}}"
style="height:450p
x;width:550px"clas
s="img-rounded"
alt="Gesture">
</div>
<div class="col-
sm-6">
<div>
<h4>Drop in the
image to get the
prediction </h4>
<form action = ""
id="upload-file"
method="post"
enctype="multipart
/form-data">
<select
```

```
name="plant">



type</option>


</select><br>

<option
value="select"
selected>Select
plant

<option
value="fruit">Fruit<
/option>
<option
value="vegetable">
Vegetable</optio
n>

<label
for="imageUpload"
class="upload-
label"
style="backgroun
d: #28272c;">
Choose...
</label>
<input type="file"
```

```
name="image"
id="imageUpload"
accept=".png, .jpg,
.jpeg">
</form>


<div class="image-
section"
style="display:non
e;">
<div class="img-
preview">
<div
id="imagePreview
">
</div>
</div>
<div>

<button
type="button"
class="btn btn-info
btn-lg " id="btn-
predict"
style="backgroun
d:
#28272c;">Predict
!</button>
</div>
</div>
```

```
<div class="loader"
style="display:non
e;"></div>


<h3>

</h3>


<span id="result"
style="font-
size:17px; ">
</span>


</div>
</div>

</div>
</div>
</div>
</div>
</body>

<footer>
<script src="{{
url_for('static',
filename='js/main.
js') }}"
```

```
type="text/javascri
pt"></script>
</footer>
</html>
.img-preview {
     width: 256px;
     height: 256px;
    position:
relative;
    border: 5px
solid #F8F8F8;
    box-shadow:
0px 2px 4px 0px
rgba(0, 0, 0, 0.1);
    margin-top:
1em;
    margin-bottom:
1em;
}

.img-preview>div {
    width: 100%;
    height: 100%;
    background-
size: 256px 256px;
    background-
repeat: no-repeat;
     background-
position: center;
}
```

```
input[type="file"]
 {
     display: none;
}


.upload-label
{
    display: inline-
block;
     padding: 12px
30px;
     background:
#28272c;
     color: #fff;
     font-size: 1em;
     transition: all
.4s; cursor:
pointer;
}
.upload-
label:hover{
    background:
#C2C5A8;
     color:
#39D2B4;
}
.loader {
    border: 8px
solid #f3f3f3;
    /* Light grey */
    border-top: 8px
solid #28272c;
    /* Blue */
border-radius:
50%;
   width: 50px;
height: 50px;
    animation: spin
1s linear infinite;
}
@keyframes spin {
   0% {
   transform:
rotate(0deg);
}
100%
{
   transform:
rotate(360deg);
}
}
```

## GitHub & Project Demo Link

https://github.com/IBM-EPBL/IBM-Project-17634-1659674521

https://drive.google.com/drive/folders/1ic_bE13Q-jQ9Di9Wkq7BlZFO2c_bLPeV