Fertilizers Recommendation System For

Disease Prediction

TEAM ID: **PNT2022TMID15019**

TEAM MEMBERS

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# 1. INTRODUCTION

1.1 PROJECT OVERVIEW

Agriculture is the most important sector in today’s life. Most plants are affected by a wide variety of bacterial and fungal diseases. Diseases on plants placed a major constraint on the production and a major threat to food security. Hence, early and accurate identification of plant diseases is essential to ensure high quantity and best quality. In recent years, the number of diseases on plants and the degree of harm caused has increased due to the variation in pathogen varieties, changes in cultivation methods, and inadequate plant protection techniques.

An automated system is introduced to identify different diseases on plants by checking the symptoms shown on the leaves of the plant. Deep learning techniques are used to identify the diseases and suggest the precautions that can be taken for those diseases.

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

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. Also proposed a simple prediction method for soil based fertilizer recommend ratio system for predicted crop diseases. This method gives less accuracy and prediction. proposed an IoT based system for leaf disease detection and fertilizer recommendation which is based on Machine Learning techniques yields less 80 percentage accuracies.

2.2 REFERENCES

[1]. [R Indumathi.;](https://ieeexplore.ieee.org/author/37887897500) [N Saagari.;](https://ieeexplore.ieee.org/author/37087060007) [V Thejuswini.;](https://ieeexplore.ieee.org/author/37087058056) [R Swarnareka.,](https://ieeexplore.ieee.org/author/37087056414)" Leaf Disease Detectionand Fertilizer Suggestion", [IEEE International Conference on System, Computation, Automation and Networking (ICSCAN),](https://ieeexplore.ieee.org/xpl/conhome/8870340/proceeding) 29-30 March 2019, DOI: [10.1109/ICSCAN.2019.8878781.](https://doi.org/10.1109/ICSCAN.2019.8878781)

[2]. P. Pandi Selvi, P. Poornima, "Soil Based Fertilizer Recommendation System for Crop Disease Prediction System", International Journal of Engineering Trends and Applications (IJETA) – Volume 8 Issue 2, Mar-Apr 2021 .

[3]. H Shiva reddy, Ganesh hedge, Prof. DR Chinnaya3, "IoT based Leaf Disease

Detection and Fertilizer Recommendation", International Research Journal of Engineering and Technology (IRJET), Volume: 06 Issue: 11, Nov 2019, e-ISSN: 2395-0056.

2.3 PROBLEM STATEMENT DEFINITION

1. Preprocess the images.
2. Applying the CNN algorithm to the dataset.
3. How deep neural networks detect the disease.
4. You will be able to know how to find the accuracy of the model.
5. You will be able to build web applications using the Flask framework.

# 3. IDEATION &PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

Agriculture plays a major role in economic growth and development. As the provider of food it is acornerstone of human existence. As a furnisher of industrial raw materials it is an important contributor to economic activity in other sectors of the economy,For our project, we are getting surveys from farmers to understand what they truly require and desire

3.2 IDEATION & BRAINSTROMING

3.3 PROPOSED SOLUTION

**Proposed Solution Template:**

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

|  |  |  |
| --- | --- | --- |
| **S.No** | **Parameter** | **Description** |
| 1. | Problem Statement (Problem to besolved) | 1. Because of a lack of expertise and outdated procedures, farmers are unable to identify crop diseases. 2. When only a few crops are grown, the soil becomes depleted, and if the crops are injured by diseases, |
| 2. | Idea / Solution description | 1. If there is a sickness affecting the crop, the user is then presented with a workable cure.      1. The ability to anticipate agricultural yield based on location and the effective application of algorithms has demonstrated that a higher crop yield is possible. |

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| --- | --- | --- | --- |
| 3. | Novelty / Uniqueness | • | Use a smart irrigation system on farms to increase production |
|  |  | • | Using image processing to detect crop illnesses so that users can order herbicides based on disease photos |
| 4. | Social Impact / Customer Satisfaction | • | Using cloud computing to provide complete irrigation data |
|  |  | • | Effective use of current knowledge via artificial intelligence |
| 5. | Business Model (Revenue Model) | • | The suggested method use SVM to categorise tree leaves, detect disease, and provide fertilizer |
|  |  | • | Support Vector Machines are effective at predicting crop yields. |
| 6. | Scalability of the Solution | • | Support Vector Machine  Random Forest algorithm |

3.4 PROBLEM SOLUTION FIT

|  |  |  |
| --- | --- | --- |
| **FR No.** | **Functional Requirement** | **Sub Requirement** |
| FR-1 | User Registration | Registration through form  Registration through Gmail  Registration through LinkedIn |

# 4. REQUIRMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENTS

Functional Requirements:

Following are the functional requirements of the proposed solution.

|  |  |  |
| --- | --- | --- |
| FR-2 | Image Capture | Take image of a leaf  Check the leaf is captured undergiven parameters |
| FR-3 | Image Processing | Upload the leaf image Click the predict button |
| FR-4 | Updated Native Language | Languages can be changed according to the user, which heis more understandable with. (Ex: English, Hindi, Tamil) |
| FR-5 | Leaf Prediction | Add the pesticides and fertilizers to be used for an unhealthy leaf |
| FR-6 | Image Description | Show the prescribed fertilizer and description of the diseasefor curing a unhealthy leaf |
| FR-7 | Providing Datasets | Training datasets Testing datasets |
| FR-8 | Adding Datasets | Fruit datasets for fruits Vegetable datasets for vegetables |
| FR-9 | E-mail Notification | Farmers will be received a Email notification about the leaf and its history |

4.2 NON-FUNCTIONAL REQUIREMENTS

Non-functional Requirements:

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

Z

|  |  |  |
| --- | --- | --- |
| **NFR No.** | **Non-Functional Requirement** | **Description** |
| NFR-1 | Usability | Leaf datasets can be used for detection of all kind of leafs Datasets can be reusable Datasets can be prepared according to the leaf |
| NFR-2 | Security | User information and leaf data are secured  The algorithms used are more secure |
| ZZNFR-3 | Reliability | The leaf quality is more  The datasets and image capturing performs consistently well |
| NFR-4 | Performance | Leaf problem defines once the leafis detected  Performs well according to the quality of leaf provides certain cure to it. |
| NFR-5 | Availability | Quality of leaf will be used againfor detection  Available and easy access of datasets provided |
| NFR-6 | Scalability | Increase in growth of predicting the results and defining a leaf |

# 5. PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS

5.2 SOLUTION & TECHNICAL ARCHITECTURE

Plant crop disease is anticipated, and appropriate fertilizer is advised for a higher yield. The diseased plant photos are acquired and preprocessed in comparison to the dataset of diseased plants. The photos are processed using a Deep Learning algorithm, which is subsequently tested. A model is then created based on the evaluations, trained using a variety of inputs, and predictions are presented to the users, aiding in the fertilizer recommendation process. The inclusion of the Convolutional layers in the classification and processing of the images further aids in

5.3 USER STORIES

A digital camera or similar devices are used to take images of different types, and then those are used to identify the affected area in leaves. Then different types of image-processing techniques are applied to them, the process those images, to get different and useful features needed for the purpose of analyzing later-Plant leaf disease identification is especially needed to predict both the quality and quantity of the First segmentation step primarily based on a mild polygonal leaf model is first achieved and later used to guide the evolution of an energetic contour. Combining global shape descriptors given by the polygonal model with local curvature

# 6. PROJECT PLANNING & SCHEDULING

6.1 SPRINT PLANNING & ESTIMATION

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sprint** | **Functio nal Require ment (Epic)** | **User**  **Story**  **Number** | **User Story / Task** | **Sto ry Poi nts (Tot al)** | **Priority** | **Team Members** |
| Sprint-2 | Model Creation and Training |  | Create a model which can classify diseasedplants from the healthy plant | 6 | High | SIVAKUMAR SRINESH |
|  | Registration | USN-1 | As a user, I can register by entering my email, password, and confirming my password or viaOAuth API | 3 | Medium | SRINESH |
|  | Upload page | USN-2 | As a user, I will be redirected to a page where Ican upload my pictures of crops | 4 | High | SIVAKUMAR |
|  | Suggestion results | USN-3 | As a user, I can view the results and then obtainthe suggestions provided by the ML model | 4 | High | SRINESH SIVAKUMAR |
|  | Base Flask App |  | A base Flask web app must be created as aninterface for the ML model | 2 | High | SIVAKUMAR SRINESH |
| Sprint-3 | Login | USN-4 | As a user/admin/shopkeeper, I can log into theapplication by entering email & password | 2 | High | SRISURAJ |
|  | User Dashboard | USN-5 | As a user, I can view the previous results andhistory | 3 | Medium | SUNDARESWAR |
|  | Integration |  | Integrate Flask, CNN model with MySql DB | 5 | Medium | SRISURAJ  SUNDARESWAR |

6.2 SPRINT DELIVERY SCHEDULE

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| --- | --- | --- | --- | --- | --- | --- |
| **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 | 10 | 5 Days | 01 NOV 2022 | 05 NOV 2022 | 10 | 05 NOV 2022 |
| Sprint-2 | 15 | 5 Days | 06 NOV 2022 | 10 Nov 2022 | 15 | 10 Nov 2022 |
| Sprint-3 | 15 | 4 Days | 11 Nov 2022 | 14 Nov 2022 | 15 | 15 Nov 2022 |
| Sprint-4 | 12 | 4 Days | 16 Nov 2022 | 19 Nov 2022 | 10 | 20 Nov 2022 |

6.3 REPORTS FROM JIRA

# 7. CODING & SOLUTIONING

7.1 FEATURE 1

The application's registration page is created. User registration is carried out if the user hasn't already done so. Enough work was put into making this process seamless. If the user has registered, he can now log in directly. Email address, name, and password were required for registration. The code to link it to the backend was successful, and this data is stored in Firebase.

7.2 FEATURE 2

The trained machine learning model can predict the output from an image that is uploaded, and the nutrition facts are also displayed on the same page. The model's accuracy was determined to be 95%, and when it was trained on the IBM cloud, it reached 100%.

7.3 DATABASE SCHEMA

The Firebase platform was used. A mechanism for storing and retrieving data that is modelled in ways other than the tabular relations used in relational databases is provided by the Firebase database (NoSQL).

# 8. TESTING

8.1 TEST CASES

The test cases include invalid email and unrecognizable images. For the image part, a text file or other format files were uploaded as a corner case.

8.2 USER ACCEPTANCE TESTING

10 users of the test application were able to discover the nutritional data for the fruit image they supplied. This combined and tested both the registration and prediction modules, which showed to provide accurate results.

9. RESULTS

9.1 PERFORMANCE METRICS

## INTRODUCTION PAGE :-

## 

## SELECTION BOX :-

UPLOADING IMAGE:-

## RESULT DISPLAY:-

# 10. ADVANTAGES &DISADVANTAGES

ADVANTAGES:

1. The suggested model yields extremely high classification accuracy
2. It can train and test on very large datasets.
3. It can resize very high-quality images within itself.

DISADVANTAGES:

1. The proposed model is computationally expensive to train and test.
2. The neural network architecture used in this project work is highly complex.

# 11. CONCLUSION

The model here involves classifying images from datasets of fruits and vegetables. The number of epochs was increased to boost categorization accuracy. Different classification accuracies are obtained for different batch sizes. The accuracies are increased by adding more convolution layers. The accuracy of classification is also increased by adjusting the number of dense layers. The accuracies are different while varying the size of the train and test datasets.

# 12. FUTURE SCOPE

The model that is being provided in this project work can be expanded to recognise images.

Using python to exe software, the complete model may be turned into application software. With the aid of the OpenCV Python package, real-time image categorization, picture recognition, and video processing are all made feasible. This project's work can be expanded to include security applications including face, iris, and figure print recognition.

1. APPENDIX

13.1 SAMPLE SOURCE CODE:-

Index.html

|  |
| --- |
| <section class="banner\_w3lspvt" id="home">  <div class="csslider infinity" id="slider1">    <div class="banner-top">  <div class="overlay">  <div class="container">  <div class="w3layouts-banner-info text-center">  <h3 class="text-wh">Fertilizer Recommendation  System</h3>  <h4 class="text-wh mx-auto my- 4"><b><strong>PNT2022TMID26444</strong></b></h4>  <br>  <h4 class="text-wh mx-auto my-4"><strong>  </strong></h4>  <p class="text-li mx-auto mt-2">   1. Ellakkiya V <br>I 2. Bharat ARV <br> 3. Sri suvetha CS <br> 4. Ashish DR</p>   </div>  </div>  </div>  </div>  </div>  </section>  <!-- //banner -->  <!-- core values -->  <section class="core-value py-5">  <div class="container py-md-4">  <h3 class="heading mb-sm-5 mb-4 text-center"> About Us</h3>  <div class="row core-grids">  <div class="col-lg-6 core-left">  <img src="{{ url\_for('static', filename='images/core.jpg') }}"  class="img-fluid" alt="" />  </div>  <div class="col-lg-6 core-right">  <h3 class="mt-4">Improving Agriculture, Improving Lives,  Cultivating Crops To Make Farmers Increase  Profit.</h3>  <p class="mt-3">Agriculture is the most important sector in  today’s life. Most plants are affected by a wide variety of bacterial and |

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| --- |
| fungal diseases. Diseases on plants placed a major constraint on the production and a major threat to food security. Hence, early and accurate identification of plant diseases is essential to ensure high quantity and best quality. In recent years, the number of diseases on plants and the degree of harm caused has increased due to the variation in pathogen varieties, changes in cultivation methods, and inadequate plant protection techniques.  An automated system is introduced to identify different  diseases on plants by checking the symptoms shown on the leaves of the plant. Deep learning techniques are used to identify the diseases and suggest the precautions that can be taken for those diseases</p> </div>  </div>  </div>  </section>  <!-- //core values -->  <!-- Products & Services -->  <section class="blog py-5">  <div class="container py-md-5">  <h3 class="heading mb-sm-5 mb-4 text-center"> Our Services</h3>  <div class="ro blog-grids">  <div class="col-lg-4 col-md-6 blog-left mb-lg-0 mb-sm-5 pb-lg-0  pb-5">  <a href="">  <div class="blog-info">  <h4></h4>  <p class="mt-2"> </p>  </div>  </a>  </div>  <div class="col-lg-4 col-md-6 blog-middle mb-lg-0 mb-sm-5 pb-lg-0  pb-md-5">  <a href="{{ url\_for('fertilizer\_recommendation') }}">  <div class="blog-info">  <h4></h4>  </div>  </a>  </div> |

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| <div class="col-lg-4 col-md-6 blog-right mt-lg-0 mt-5 pt-lg-0 pt-  md-5">  <centre><img src="{{ url\_for('static',  filename='images/s4.jpg') }}" class="img-fluid" alt=""></centre>  <!-- <img src="images/s4.jpg" class="img-fliud" alt="" /> -->  <a href="{{ url\_for('disease\_prediction') }}">  <div class="blog-info">  <h4>Crop Disease Prediction</h4>  <p class="mt-2">Predicting the name and causes of crop  disease and suggestions to cure it</p>  </div>  </a>  </div>  </div>  </div>  </section>  <!-- //Products & Services -->  <!-- Creating custom grid and hover effect  <section>  <div class="col-lg-3 col-md-4 col-sm-6 col-xs-12">  <div class="hovereffect">  <img class="img-responsive" src="images/s2.jpg" alt="">  <div class="overlay">  <h2>Hover effect 1</h2>  <a class="info" href="#">link here</a> </div>  </div> </div> -->  </html> |

Crop.html

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| --- |
| <section class="banner\_w3lspvt" id="home">  <div class="csslider infinity" id="slider1">  <div class="banner-top">  <div class="overlay">  <div class="container">  <div class="w3layouts-banner-info text-center">  <h3 class="text-wh">Fertilizer Recommendation  System</h3>  <h4 class="text-wh mx-auto my- 4"><b><strong>PNT2022TMID26444</strong></b></h4>  <br>  <h4 class="text-wh mx-auto my-4"><strong>  </strong></h4>  <p class="text-li mx-auto mt-2">   1. Ellakkiya V <br> 2. Bharat ARV <br> 3. Sri suvetha CS <br> 4. Ashish DR</p>   </div>  </div>  </div>  </div>  </div> </section>  <!-- //banner -->  <!-- core values -->  <section class="core-value py-5">  <div class="container py-md-4">  <h3 class="heading mb-sm-5 mb-4 text-center"> About Us</h3>  <div class="row core-grids">  <div class="col-lg-6 core-left">  <img src="{{ url\_for('static', filename='images/core.jpg') }}"  class="img-fluid" alt="" />  </div>  <div class="col-lg-6 core-right">  <h3 class="mt-4">Improving Agriculture, Improving Lives,  Cultivating Crops To Make Farmers Increase  Profit.</h3>  <p class="mt-3">Agriculture is the most important sector in  today’s life. Most plants are affected by a wide variety of bacterial and fungal diseases. Diseases on plants placed a major constraint on the production and a major threat to food security. Hence, early and accurate identification of plant diseases is essential to ensure high quantity and best |

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| quality. In recent years, the number of diseases on plants and the degree of harm caused has increased due to the variation in pathogen varieties, changes in cultivation methods, and inadequate plant protection techniques.  An automated system is introduced to identify different  diseases on plants by checking the symptoms shown on the leaves of the plant. Deep learning techniques are used to identify the diseases and suggest the precautions that can be taken for those diseases</p> </div>  </div>  </div>  </section>  <!-- //core values -->  <!-- Products & Services -->  <section class="blog py-5">  <div class="container py-md-5">  <h3 class="heading mb-sm-5 mb-4 text-center"> Our Services</h3>  <div class="ro blog-grids">  <div class="col-lg-4 col-md-6 blog-left mb-lg-0 mb-sm-5 pb-lg-0  pb-5">  <a href="">  <div class="blog-info">  <h4></h4>  <p class="mt-2"> </p>  </div>  </a>  </div>  <div class="col-lg-4 col-md-6 blog-middle mb-lg-0 mb-sm-5 pb-lg-0  pb-md-5">  <a href="{{ url\_for('fertilizer\_recommendation') }}">  <div class="blog-info">  <h4></h4>  </div>  </a>  </div>  <div class="col-lg-4 col-md-6 blog-right mt-lg-0 mt-5 pt-lg-0 pt-  md-5"> |

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| <centre><img src="{{ url\_for('static',  filename='images/s4.jpg') }}" class="img-fluid" alt=""></centre>  <!-- <img src="images/s4.jpg" class="img-fliud" alt="" /> -->  <a href="{{ url\_for('disease\_prediction') }}">  <div class="blog-info">  <h4>Crop Disease Prediction</h4>  <p class="mt-2">Predicting the name and causes of crop  disease and suggestions to cure it</p>  </div>  </a>  </div>  </div>  </div>  </section>  <!-- //Products & Services -->  <!-- Creating custom grid and hover effect  <section>  <div class="col-lg-3 col-md-4 col-sm-6 col-xs-12">  <div class="hovereffect">  <img class="img-responsive" src="images/s2.jpg" alt="">  <div class="overlay">  <h2>Hover effect 1</h2>  <a class="info" href="#">link here</a> </div>  </div>  </div> -->  </html> |

Crop-result.html

|  |
| --- |
| <style> .mt-0 { margin-top: 50 !important;  }  </style>      <div class="container py-2 mx-auto my-50 h-10 " style="margin: 12rem;">  <div class="row">  <div class="col-sm py-2 py-md-3">  <div class="card card-body" style="justify-content: center;">  <h1 class="text-center"><b>You should grow <i>{{ prediction }}  </i>in your farm</b></h1>  </div>  </div>  </div>  </div> |

Disease.html

|  |
| --- |
| <style> html body { background-color: rgb(182, 145, 232); }  </style>  <br /><br />  <h2 style="text-align: center; margin: 0px; color: black">  <b>Find out which disease has been caught by your plant</b>  </h2>  <br />  <br>    <div style=" width: 350px; height: 50rem; margin: 0px auto; color: black; border-radius: 25px; padding: 10px 10px; font-weight: bold;  ">          <form class="form-signin" method=post enctype=multipart/form-data> |
| <h2 class="h4 mb-3 font-weight-normal"><b>Please Upload The Image</b></h2>  <input type="file" name="file" class="form-control-file" id="inputfile" onchange="preview\_image(event)" style="font-weight: bold;">  <br>  <br>  <img id="output-image" class="rounded mx-auto d-block" />  <button class="btn btn-lg btn-primary btn-block" type="submit" style="font-weight: bold;">Predict</button>      </form>  </div>    <script type="text/javascript"> function preview\_image(event) { var reader = new FileReader(); reader.onload = function () { var output = document.getElementById('output-image') output.src = reader.result;  } reader.readAsDataURL(event.target.files[0]); }  </script>  </div> |

Disease-result.html

|  |
| --- |
| <div class="container py-2 mx-auto my-50 h-10 " style="margin: 9rem;">  <div class="row">  <div class="col-sm py-2 py-md-3">  <div class="card card-body" style="justify-content: center;  background-color:blanchedalmond">  <p class="text-center" style="color: black; font-size: 22px;">{{  prediction }}</p>  </div>  </div>  </div>  </div> |

Fertilizer.html

|  |
| --- |
| <style> html body { background-color: rgb(206, 206, 228); }  </style>  <!--Form Section-->  <br /><br />  <h2 style="text-align: center; margin: 0px; color: black">  <b>Get informed advice on fertilizer based on soil</b>  </h2>  <br />  <div style=" width: 350px; height: 40rem; margin: 0px auto; color: black; border-radius: 25px; padding: 10px 10px;  "  >  <form method="POST" action="{{ url\_for('fert\_recommend') }}">  <div class="form-group">  <label for="Nitrogen" style="font-size: 17px"><b>Nitrogen</b></label>  <input type="number" class="form-control" id="Nitrogen" name="nitrogen" placeholder="Enter the value (example:50)" style="font-weight: bold" required  />  </div>  <div class="form-group">  <label for="Phosphorous" style="font-size: 17px"  ><b>Phosphorous</b></label  >  <input type="number" class="form-control" id="Phosphorous" name="phosphorous"  placeholder="Enter the value (example:50)" style="font-weight: bold" required |

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| />  </div>  <div class="form-group">  <label for="Pottasium" style="font-size: 17px"><b>Pottasium</b></label>  <input type="number" class="form-control" id="Pottasium" name="pottasium" placeholder="Enter the value (example:50)" style="font-weight: bold" required  />  </div>  <div class="form-group">  <label for="crop" style="font-size: 17px"  ><b>Crop you want to grow</b></label >  <select name="cropname" class="form-control" id="crop" placeholder="Select a crop" style="font-weight: bold" required  >  <option selected>Select crop</option>  <option>rice</option>  <option>maize</option>  <option>chickpea</option>  <option>kidneybeans</option>  <option>pigeonpeas</option>  <option>mothbeans</option>  <option>mungbean</option>  <option>blackgram</option>  <option>lentil</option>  <option>pomegranate</option>  <option>banana</option>  <option>mango</option>  <option>grapes</option>  <option>watermelon</option>  <option>muskmelon</option>  <option>apple</option>  <option>orange</option>  <option>papaya</option>  <option>coconut</option>  <option>cotton</option> |
| <option>jute</option>  <option>coffee</option>  </select> </div>    <div class="d-flex justify-content-center">  <button type="submit" class="btn btn-info" style=" color: black; font-weight: bold; width: 130px; height: 50px; border-radius: 12px; font-size: 21px;  "  >  Predict  </button>  </div>  </form>  </div> |

Fertilizer-result.html

|  |
| --- |
| <div class="container py-2 mx-auto my-50 h-10 " style="margin: 9rem;">  <div class="row">  <div class="col-sm py-2 py-md-3">  <div class="card card-body" style="justify-content: center;  background-color:blanchedalmond">  <p class="text-center" style="color: black; font-size:  20px;">{{ recommendation }}</p>  </div>  </div>  </div>  </div> |

Layout.html

|  |
| --- |
| <!DOCTYPE html>  <html lang="en">  <head>  <title>{{ title }}</title>  <link rel="shortcut icon" href="{{ url\_for('static', filename='images/favicon.ico') }}"/>  <!-- for-mobile-apps -->  <meta name="viewport" content="width=device-width, initial-scale=1">  <meta charset="utf-8">  <meta name="keywords" content="Agro Harvest Responsive web template,  Bootstrap Web Templates, Flat Web Templates, Android Compatible web template,  Smartphone Compatible web template, free webdesigns for Nokia, Samsung, LG,  SonyEricsson, Motorola web design" />  <style> html { font-size: 1rem;  }  @media (min-width: 576px) { html { font-size: 1.25rem;  }  }  @media (min-width: 768px) { html { font-size: 1.5rem;  }  }  @media (min-width: 992px) { html { font-size: 1.75rem;  }  }  @media (min-width: 1200px) { html { font-size: 2rem;  }  html { font-size: 1rem;  } |

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| h1 { font-size: 1.2rem;  }  h2 { font-size: 1.1rem;  }  @media (min-width: 768px) { html { font-size: 1.1rem;  }  h1 { font-size: 1.3rem;  }  h2 { font-size: 1.2rem;  }  }  @media (min-width: 991px) { html { font-size: 1.2rem;  }  h1 { font-size: 1.5rem;  }  h2 { font-size: 1.4rem;  }  }  @media (min-width: 1200px) { html { font-size: 1.2rem;  }  h1 { font-size: 1.7rem;  }  h2 { font-size: 1.6rem; |

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| }  }  }  </style>  <script> addEventListener("load", function () { setTimeout(hideURLbar, 0);  }, false);  function hideURLbar() { window.scrollTo(0, 1);  }  </script>  <script src="https://code.jquery.com/jquery-3.3.1.slim.min.js" integrity="sha384-  q8i/X+965DzO0rT7abK41JStQIAqVgRVzpbzo5smXKp4YfRvH+8abtTE1Pi6jizo" crossorigin="anonymous"></script>  <script src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.14.7/umd/popper.min.js  " integrity="sha384-  UO2eT0CpHqdSJQ6hJty5KVphtPhzWj9WO1clHTMGa3JDZwrnQq4sF86dIHNDz0W1" crossorigin="anonymous"></script>  <script src="https://stackpath.bootstrapcdn.com/bootstrap/4.3.1/js/bootstrap.min.js" integrity="sha384-  JjSmVgyd0p3pXB1rRibZUAYoIIy6OrQ6VrjIEaFf/nJGzIxFDsf4x0xIM+B07jRM" crossorigin="anonymous"></script>  <script src="https://code.jquery.com/jquery-3.5.1.slim.min.js" integrity="sha384-  DfXdz2htPH0lsSSs5nCTpuj/zy4C+OGpamoFVy38MVBnE+IbbVYUew+OrCXaRkfj" crossorigin="anonymous"></script>  <script src[="https://cdn.jsdelivr.net/npm/popper.js@1.16.0/dist/umd/popper.min.js"](https://cdn.jsdelivr.net/npm/popper.js%401.16.0/dist/umd/popper.min.js) integrity="sha384-  Q6E9RHvbIyZFJoft+2mJbHaEWldlvI9IOYy5n3zV9zzTtmI3UksdQRVvoxMfooAo" crossorigin="anonymous"></script>  </body>  <!-- css files -->  <link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/bootstrap/4.3.1/css/bootstrap.min.css  " integrity="sha384-  ggOyR0iXCbMQv3Xipma34MD+dH/1fQ784/j6cY/iJTQUOhcWr7x9JvoRxT2MZw1T" crossorigin="anonymous"> |

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| <link href="{{ url\_for('static', filename='css/bootstrap.css') }}" rel='stylesheet' type='text/css' />  <!-- bootstrap css -->  <link href="{{ url\_for('static', filename='css/style.css') }}" rel='stylesheet' type='text/css' />  <!-- custom css -->  <link href="{{ url\_for('static', filename='css/font-awesome.min.css') }}" rel="stylesheet"><!-- fontawesome css -->  <!-- //css files -->  <!-- <link rel="icon" type="image/png" href="{{ url\_for('static', filename='images/favicon.png?') }}"> -->  <script type="text/JavaScript" src="{{ url\_for('static', filename='scripts/cities.js') }}"></script>  <!-- google fonts -->  <link href="//fonts.googleapis.com/css?family=Thasadith:400,400i,700,700i&amp;subset  =latin-ext,thai,vietnamese" rel="stylesheet">  <!-- //google fonts -->  <style> header { background-color: rgba(30, 30, 30, 1); margin-top: 0rem; display: block;  }  </style>  </head>  <body>  <!-- Navigation -->  <nav class="navbar navbar-expand-lg navbar-dark bg-dark static-top" style="background-color: #1C00ff00;">  <div class="container">  <a class="navbar-brand" href="{{ url\_for('home') }}">  </a>  <button class="navbar-toggler" type="button" data-  toggle="collapse" data-target="#navbarResponsive" aria-controls="navbarResponsive" aria-expanded="false" aria-  label="Toggle navigation">  <span class="navbar-toggler-icon"></span> </button> |

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| <div class="collapse navbar-collapse" id="navbarResponsive">  <ul class="navbar-nav ml-auto">  <li class="nav-item active">  <a class="nav-link" href="{{ url\_for('home') }}">Home <span class="sr-only">(current)</span> </a>  </li>  <li class="nav-item">  <a class="nav-link" href="{{ url\_for('crop\_recommend')  }}"></a>  </li>  <li class="nav-item">  <a class="nav-link" href="{{  url\_for('fertilizer\_recommendation') }}"></a>  </li>  <li class="nav-item">  <a class="nav-link" href="{{  url\_for('disease\_prediction') }}">Disease</a>  </li>  </ul>  </div>  </div>  </nav>  {% block body %} {% endblock %}  <!-- footer -->  <footer class="text-center py-5">  <div class="container py-md-3">  <!-- logo -->  <h2 class="logo2 text-center">  <a href="{{ url\_for('home') }}">  Fertilo  </a>  </h2>  <!-- //logo -->  <!-- address -->  <div class="contact-left-footer mt-4">  <!-- <a href="community.html">Community</a> --> </p>  </div> |
| <div class="w3l-copy text-center">  <p class="text-da"><br>Failure is good. It's fertilizer.  Everything I've learned about coaching, I've learned from making mistakes.  </p>  </div>  <p class="homelogo">  <p>Made with Friends</p>  <p>&copy; Copyright @2022 </p>    </div>  </footer>  <!-- //footer -->    <!-- move top icon -->  <a href="#home" class="move-top text-center"></a>  <!-- //move top icon -->  </body>  </html> |

Try again.html

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| <div class="container py-2 mx-auto my-50 h-10 text-center" style="margin:  9rem;">  <div class="row">  <div class="col-sm py-2 py-md-3">  <div class="card card-body" style="justify-content: center; background- color:blanchedalmond">  <h1 class="text-center" style="color: black; font-size:  20px;"><b>Sorry we couldn't process your request currently. <br> Please try again</b></h1>    <a href="{{ url\_for('home') }}">  <button type="submit" class="btn btn-info text-center" style=" color: black; font-weight: bold; margin: 1rem;">  Try again  </button>  </a>  </div>  </div>  </div>  </div> |

Fertilizer.csv

,Crop,N,P,K,pH,soil\_moisture

0,rice,80,40,40,5.5,30

3,maize,80,40,20,5.5,50

5,chickpea,40,60,80,5.5,60

12,kidneybeans,20,60,20,5.5,45

13,pigeonpeas,20,60,20,5.5,45

14,mothbeans,20,40,20,5.5,30

15,mungbean,20,40,20,5.5,80

18,blackgram,40,60,20,5,60

24,lentil,20,60,20,5.5,90

60,pomegranate,20,10,40,5.5,30

61,banana,100,75,50,6.5,40

62,mango,20,20,30,5,15

63,grapes,20,125,200,4,60

66,watermelon,100,10,50,5.5,70 67,muskmelon,100,10,50,5.5,30

69,apple,20,125,200,6.5,50

74,orange,20,10,10,4,60

75,papaya,50,50,50,6,20

88,coconut,20,10,30,5,45

93,cotton,120,40,20,5.5,70

94,jute,80,40,40,5.5,20

95,coffee,100,20,30,5.5,20 Model.py

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| --- |
| import torch import torch.nn as nn  import torch.nn.functional as F    def ConvBlock(in\_channels, out\_channels, pool=False):  layers = [nn.Conv2d(in\_channels, out\_channels, kernel\_size=3, padding=1),  nn.BatchNorm2d(out\_channels), nn.ReLU(inplace=True)]  if pool:  layers.append(nn.MaxPool2d(4))  return nn.Sequential(\*layers)      # Model Architecture class ResNet9(nn.Module):  definit(self, in\_channels, num\_diseases):  super(). init ()  self.conv1 = ConvBlock(in\_channels, 64) self.conv2 = ConvBlock(64, 128, pool=True) # out\_dim : 128 x 64 x 64 self.res1 = nn.Sequential(ConvBlock(128, 128), ConvBlock(128, 128))    self.conv3 = ConvBlock(128, 256, pool=True) # out\_dim : 256 x 16 x 16 self.conv4 = ConvBlock(256, 512, pool=True) # out\_dim : 512 x 4 x 44 self.res2 = nn.Sequential(ConvBlock(512, 512), ConvBlock(512, 512))    self.classifier = nn.Sequential(nn.MaxPool2d(4),  nn.Flatten(),  nn.Linear(512, num\_diseases))    def forward(self, xb): # xb is the loaded batch out = self.conv1(xb) out = self.conv2(out) out = self.res1(out) + out out = self.conv3(out) out = self.conv4(out) out = self.res2(out) + out out = self.classifier(out) return out |

REQUIREMENTS argon2-cffi==20.1.0 astroid==2.4.2 async-generator==1.10 attrs==20.3.0 backcall==0.2.0 bleach==3.2.1 certifi==2020.12.5 cffi==1.14.4 chardet==3.0.4 click==7.1.2 cycler==0.10.0 dataclasses==0.6 decorator==4.4.2 defusedxml==0.6.0 docopt==0.6.2 entrypoints==0.3 Flask==1.1.2 future==0.18.2 gunicorn==20.0.4 idna==2.10 ipykernel==5.3.4 ipython==7.19.0 ipython-genutils==0.2.0 ipywidgets==7.5.1 isort==5.6.4 itsdangerous==1.1.0 jedi==0.17.2 Jinja2==2.11.2 joblib==0.17.0 jsonschema==3.2.0 jupyter==1.0.0 jupyter-client==6.1.7 jupyter-console==6.2.0 jupyter-core==4.7.0 jupyterlab-pygments==0.1.2 kiwisolver==1.3.1 lab==6.2 lazy-object-proxy==1.4.3 MarkupSafe==1.1.1 matplotlib==3.3.3 mccabe==0.6.1 mistune==0.8.4 nbclient==0.5.1 nbconvert==6.0.7 nbformat==5.0.8 nest-asyncio==1.4.3 notebook==6.1.5 numpy==1.19.4 packaging==20.4 pandas==1.1.4 pandocfilters==1.4.3 parso==0.7.1 pexpect==4.8.0 pickleshare==0.7.5 Pillow==8.0.1 pipreqs==0.4.10 prometheus-client==0.9.0 prompt-toolkit==3.0.8 ptyprocess==0.6.0 pycodestyle==2.6.0 pycparser==2.20 pyflakes==2.2.0 Pygments==2.7.2 pylint==2.6.0 pyparsing==2.4.7 pyrsistent==0.17.3 python-dateutil==2.8.1 pytz==2020.4 pyzmq==20.0.0 qtconsole==5.0.1 QtPy==1.9.0 requests==2.25.0 scipy==1.5.4 toml==0.10.2 torch==1.7.0+cpu torchaudio==0.7.0 torchvision==0.8.1+cpu tornado==6.1 traitlets==5.0.5 txt2tags==3.7 typing-extensions==3.7.4.3 urllib3==1.26.2 wcwidth==0.2.5 webencodings==0.5.1 Werkzeug==1.0.1 widgetsnbextension==3.5.1 wrapt==1.12.1 xgboost==1.2.1 yarg==0.1.9

13.2 GITHUB

[TEAM PNT2022TMID15019- GITHUB LINK](https://github.com/IBM-EPBL/IBM-Project-11903-1659355371)

13.3 PROJECT DEMO LINK

video link[-](https://youtu.be/BL7W1mFJfSw) <https://youtu.be/60cTLjZwrF8>