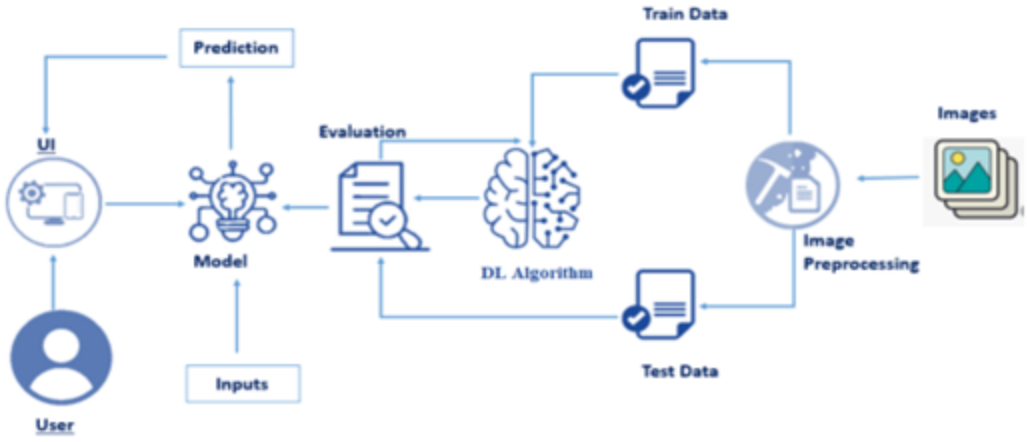
Fertilizers Recommendation System for Disease Prediction

Problem Statement

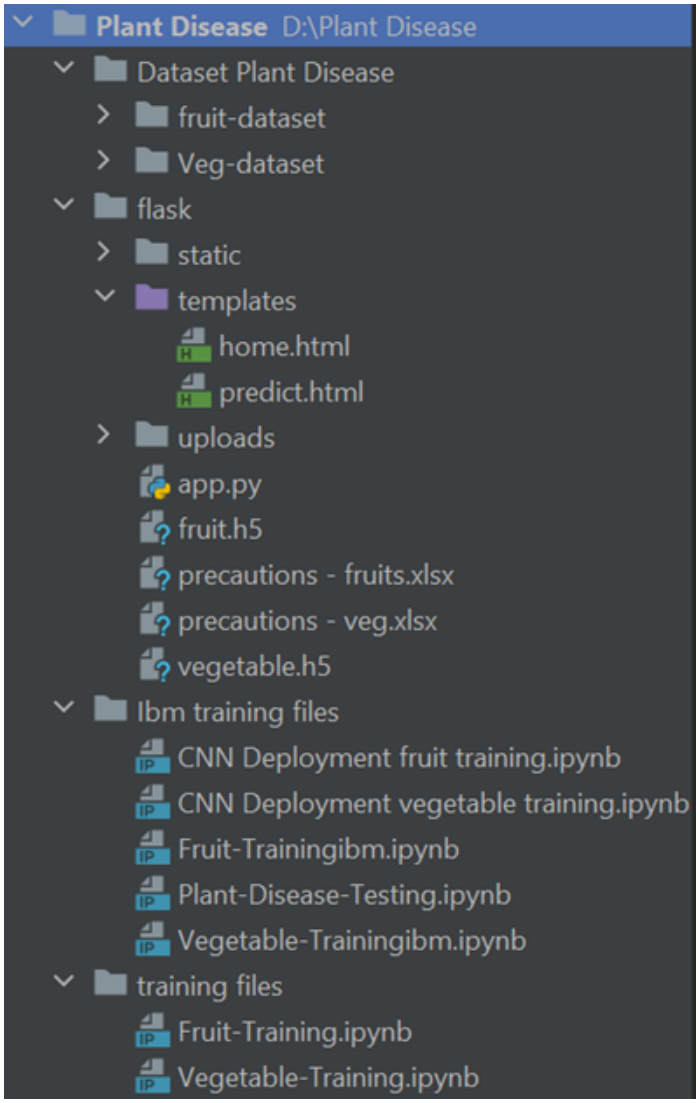
Agriculture is the most important sector in today's life. Most plants are affected by a wide variety of bacterial and fungal diseases. Diseases on plants placed a major constraint on the production and a major threat to food security. Hence, early and accurate identification of plant diseases is essential 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.

Technical Architecture



Project Structure



To accomplish the above tasks, the following activities must be completed:

- Download the dataset.
- Classify the dataset into train and test sets.
- Add the neural network layers.
- Load the trained images and fit the model.
- Test the model.
- Save the model and its dependencies.

- Build a Web application using a flask that integrates with the model built.

Download the dataset

The dataset has been downloaded from the link provided.

Classify the dataset into train and test sets

The dataset has been classified and the testing and training sets are provided separately.

Image Preprocessing

With all the data collected, train the model. But, before training the model preprocess the images and then feed them on to the model for training. Keras ImageDataGenerator class is used for image preprocessing. Image Pre-processing includes the following main tasks

- Import ImageDataGenerator Library.
- Configure ImageDataGenerator Class.
- Applying ImageDataGenerator functionality to the train set and test set.

Build the model

A model has been built and trained with multiple input images.

Test the model

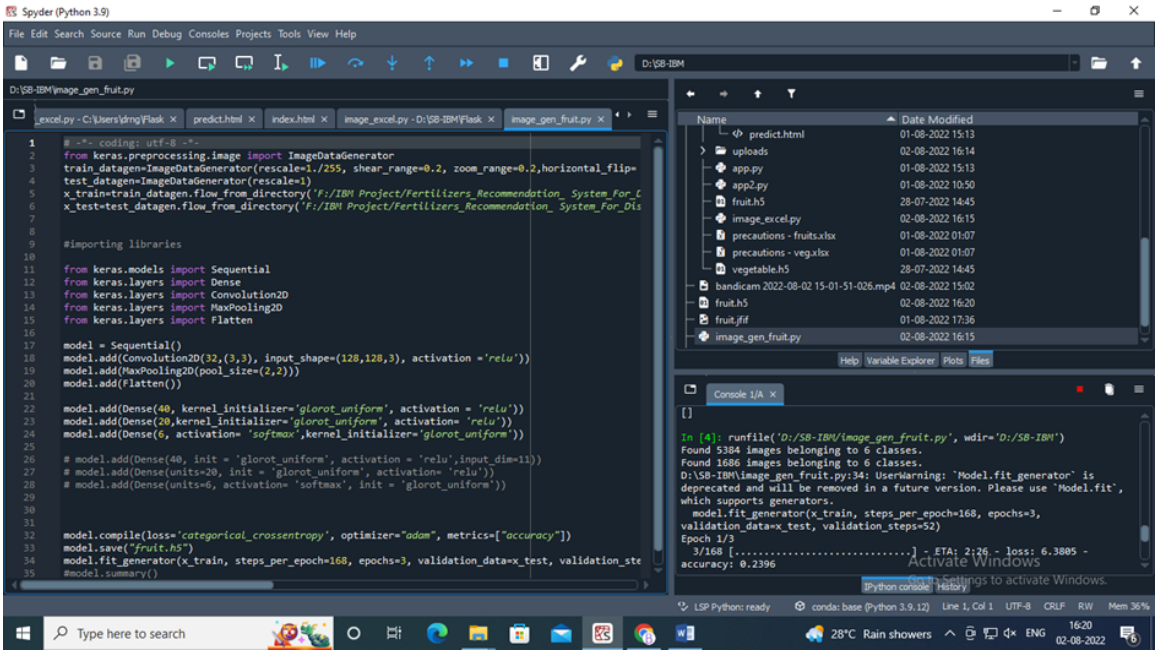
Here, the model built previously has been tested with random input images to provide precautions for the diseases that might affect.

Build web application

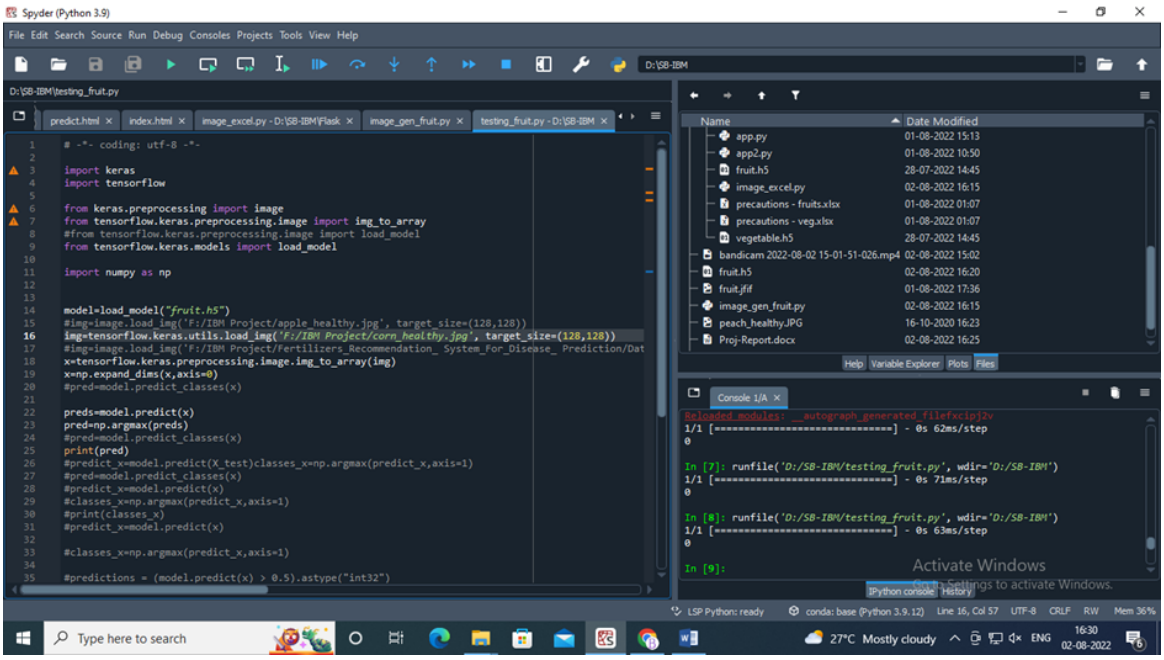
A front end web application has been designed with Flask and integrated with the model built. The interfaces receives an image of the affected fruit or vegetable leaf as input and predicts the disease and provides precautions to overcome those diseases.

Model Generation

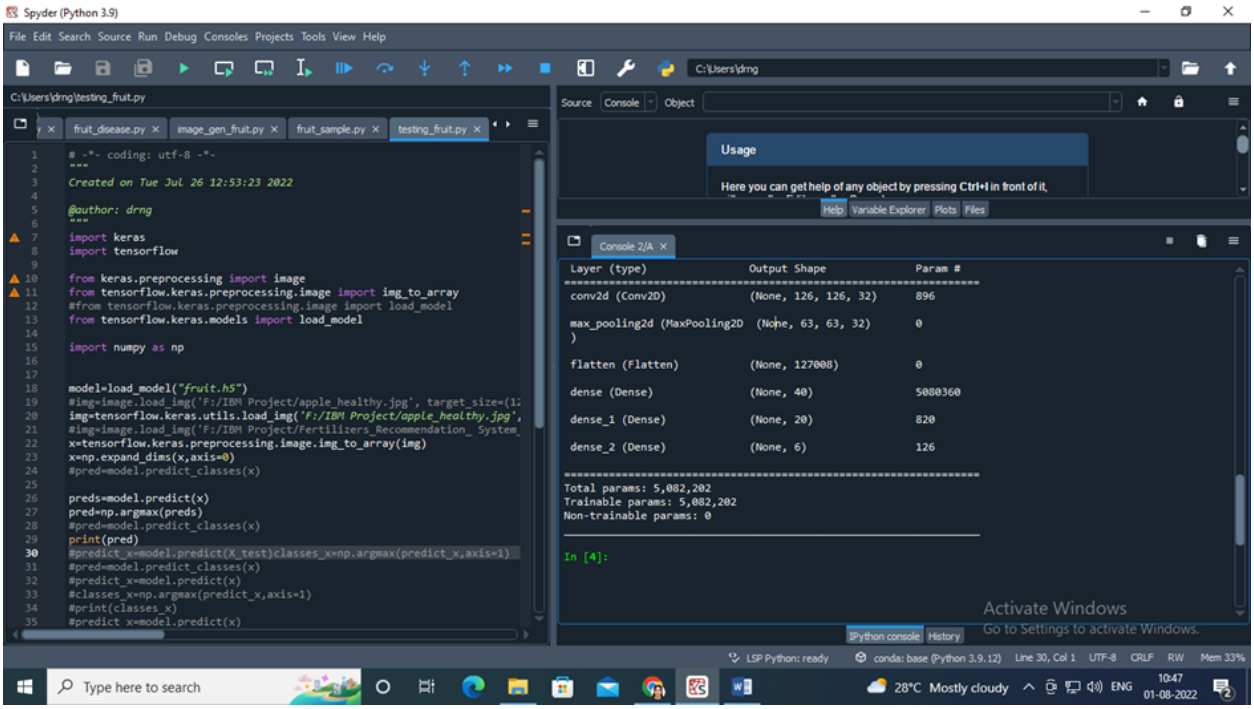
image_gen_fruit.py



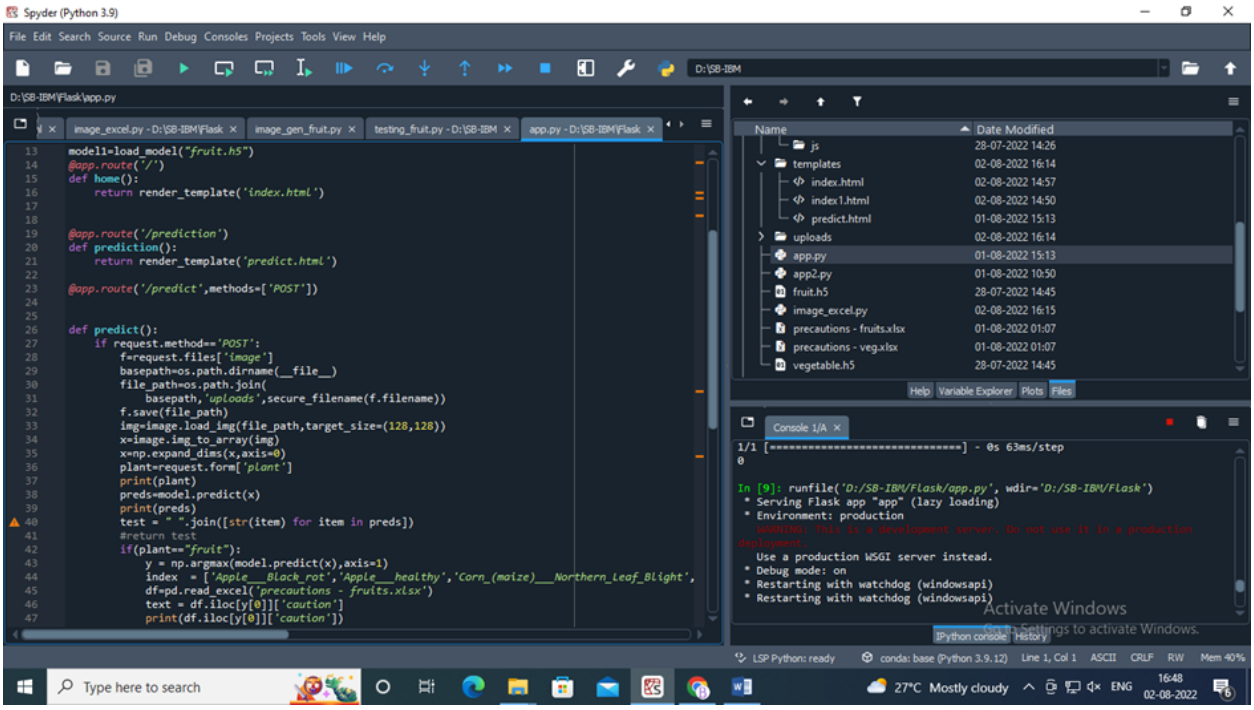
testing_fruit.py



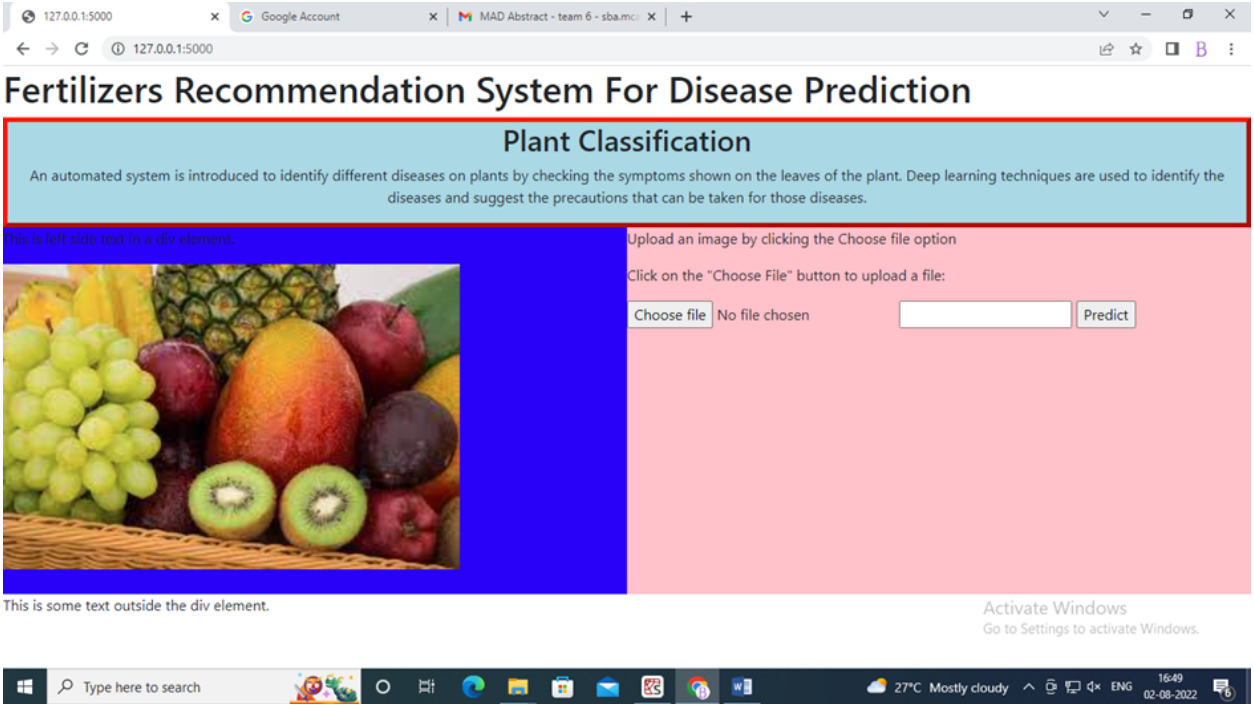
Output of Testing



app.py



Prediction Output



Precaution message

127.0.0.1:5000/predict

Oopps!! Your peach plant is infected by Bacterial Spots. This is a difficult disease to control when environmental conditions favor pathogen spread. Compounds for the treatment include copper, oxytetracycline (Mycoshield and generic equivalents), and syllit+captan; however, repeated applications are typically necessary for even minimal disease control.