Plant Disease Detection System for Sustainable Agriculture

Problem Statement

Plant diseases pose a major threat to agricultural productivity, resulting in losses in yield and economic losses. Early detection and accurate classification of plant diseases are crucial for proper crop management. This project envisages creating a Convolutional Neural Network (CNN) model that will identify and classify plant diseases from images of different crops like apple, cherry, grape, and corn. The model must recognize both healthy and infected leaves and correctly predict the exact nature of the disease. Through early detection, this system will facilitate precision agriculture by timely intervention and better disease management.

Pipeline of the above project :

(1) Data Collection & Uploading

- Collect image data.
- Upload the dataset (possibly to Google Drive).
- Use Google Colab and mount the drive to access data.

(2) Zipping and Mounting

- Zip the dataset and upload to Google Drive.
- Use Python code to mount the drive, unzip the dataset, and access it in the notebook.

(3) Dataset Splitting

- Split the dataset into:
    - train
    - validation (valid)
    - test

- Further split into categories (e.g., category 1, category 2, etc.).

(4) Image Processing & Augmentation

- Resize all images to the same dimensions (e.g., 128×128).
- **Image Augmentation**: Rotate, flip, zoom in/out, change colors, etc.
- Purpose: To create more training samples and make the model more robust.

(5) CNN Model Building

- Build and train a **CNN (**Convolutional Neural Network) model using the processed and augmented data.

(6) Testing & Evaluation

- Evaluate the model on the test set to measure accuracy and robustness.