Plant disease detection system for sustainable agriculture

Problem Statement :

Develop a CNN-based model capable of detecting and classifying plant diseases from images of leaves of various crops such as apple, cherry, grape, and corn. The model should accurately identify both healthy. and diseased leaves while predicting the specific type of disease. This system will aid in precision agriculture by enabling early detection and effective disease management.

Project Pipeline:

1. Collecting the Data

Start by grabbing a dataset from Google, Kaggle, or any trusted research source.
Upload it to your Google Drive so it's easy to work with.
Mount your Drive in your notebook and unzip the dataset if it's compressed.

2. Loading the Data

Load the dataset into your code.
Split it into training and testing sets. You can also add a validation set if needed.

3. Preprocessing & Augmentation

Get your images ready by resizing or changing dimensions.
Add some variation with flipping, and feel free to throw in rotation, zoom, or brightness tweaks for better results.

4. Building the Model

Use a CNN (Convolutional Neural Network) to create your image classifier.
Include layers like convolutional, pooling, flatten, and dense.

5. Training & Evaluating

Train the model on your training data.
Test it using the test set and check performance using accuracy, loss curves, and a confusion matrix.

6. Final Testing

Load your trained model and try it out on new, unseen images to see how well it predicts.