**PLANT DISEASE DETECTION SYSTEM FOR SUSTAINABLE AGRICULTURE**

**Problem Statement :**

Develop 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 prediction agriculture by enabling early detection and effective disease management.

**Data Collection and Data Loading** :

* Data Collection means getting images for your project (from internet, datasets, or manually).
* Data Loading means organizing and reading the images into your program for training.

**Image Processing :**

* This step cleans and prepares images.
* Common tasks: resizing, converting to grayscale, and normalizing pixel values.

**Image Augmentation :**

* This creates new versions of images by flipping, rotating, zooming, etc.
* It helps the model learn better and prevents overfitting.

### **Upload Zip File on Google Drive and Use in Colab :**

* You upload your dataset (as a zip file) to Google Drive.
* In Colab, you **mount** the drive, **unzip** the file, and use the data in your code.

**CNN Model :**

* A CNN is a type of deep learning model made for images.
* It finds patterns in images using layers like convolution, pooling, and fully connected layers.

### **Train / Evaluate / Test :**

* **Train**: Teach the model using your images.
* **Evaluate**: Check how well it learned (on a validation set).
* **Test**: See how it performs on completely new images.