**Problem Statement :**

The project aims to develop a Convolutional Neural Network (CNN)-based system that detects and classifies plant diseases using leaf images from crops like apple, cherry, grape, and corn.  
It will accurately identify healthy and diseased leaves and classify the specific type of disease.

This supports precision agriculture by enabling early disease detection, reducing unnecessary pesticide usage, improving crop yield, and promoting sustainable farming—a key focus under the Green Skills using AI initiative.

**Project Pipeline**

1. **Data Collection & Loading**
   * Dataset organized into train, test, and validation folders.
   * Data loaded into Google Colab for processing.
2. **ZIP Handling & Mounting**
   * Dataset zipped and uploaded to Google Drive.
   * Mounted in Colab and extracted using Python.
3. **Image Preprocessing & Augmentation**
   * Resize images to a standard size (e.g., 128x128).
   * Apply augmentations (rotation, zoom, flip) to boost dataset variety**.**
4. **CNN Model Training**
   * Build and train a CNN using TensorFlow/Keras.
   * Learn patterns for healthy vs. diseased classifications.
5. **Evaluation & Testing**
   * Evaluate model with metrics: accuracy, precision, recall.
   * Test on unseen leaf images for real-world simulation**.**