**Plant Disease Detection System**

**1. Problem Statement**

The project aims to develop a **Plant Disease Detection System** that identifies diseases in plants using image processing and machine learning techniques. In agriculture, early detection of plant diseases is crucial to prevent crop loss and ensure healthy yields. Traditional methods of disease identification are time-consuming and may not be accurate.

This system will help farmers and agricultural experts by providing an automated, quick, and reliable way to detect plant diseases from leaf images. By using a trained model, users can upload a leaf image and receive the name of the disease and possible remedies.

**2. Pipeline**

The pipeline for the Plant Disease Detection System includes the following steps:

* **Data Collection:**  
  Collect images of plant leaves with and without diseases from datasets such as PlantVillage or Kaggle.
* **Data Preprocessing:**
  + Resize images to a consistent size
  + Normalize pixel values
  + Augment data to improve model robustness
* **Model Building:**
  + Choose a CNN (Convolutional Neural Network) architecture
  + Split data into training and testing sets
  + Train the model on the training data
* **Model Evaluation:**
  + Evaluate model accuracy using metrics like precision, recall, and F1-score
  + Use a confusion matrix for detailed analysis
* **Deployment:**
  + Build a simple web interface (Flask or Streamlit)
  + Upload image and get disease prediction as output
* **Feedback & Improvement:**
  + Collect user feedback
  + Retrain model with new data if needed