SmartCrop-AI: AI-Based Plant Disease Detection

Project Problem Statement

The world is facing increasing environmental challenges due to unsustainable agricultural practices, excessive pesticide use, and limited access to early crop disease detection technologies. These issues result in reduced crop yields, soil degradation, and loss of biodiversity. Sustainable agriculture is essential to ensure food security, environmental health, and economic growth for future generations. There is an urgent need for intelligent solutions that promote responsible resource use and enable farmers to detect plant diseases early to prevent major crop losses.

Project Problem Statement

To address this issue, this project proposes an **AI-based Plant Disease Detection System (SmartCrop-AI)** using **Convolutional Neural Networks (CNNs)**. The system will classify plant leaves as *healthy* or *diseased* by analyzing image data. Such automation will help farmers identify infections early, reduce excessive pesticide use, and improve crop yield — contributing to sustainable and eco-friendly farming.

DataSet

Dataset Name: Plant Disease Dataset
Source: Kaggle (https://www.kaggle.com/datasets/emmarex/plantdisease)

About Dataset:
This dataset contains thousands of labeled images of both healthy and diseased plant leaves from various species such as tomato, potato, and maize. It is ideal for developing AI and computer vision models focused on early disease detection in crops. The dataset supports sustainability by enabling farmers to use technology for smarter and greener agriculture.