**PLANT DISEASE DETECTION FOR SYSTAINABLE AGRICULYURE**

NAME = AMAN KUMAR

DATE = 1ST MAY,2025

Brief summary of the project:

* In this project our main aim/focus will be on developing a CNN-based AI model that can detect and classify diseases using leaf images.
* In this model the leaf images we are using consist of crop like apple, cherry, grape, corn, tomato, etc.
* By identifying diseases early, this system supports sustainable agriculture through timely and accurate intervention.

INTRODUCTION

1. Role of Agriculture in food security:

* Agriculture is the backbone of food production, providing essential crops that feed the global population.
* It supports the livelihoods of billions, particularly in rural areas where farming is the primary income source.

1. Impact of Plant Diseases on Crop Yield

* Plant diseases can significantly reduce crop productivity, leading to food shortages and economic losses.
* Common diseases like blight, rust, mildew, and rot can destroy entire harvests if not detected early.

1. Role of AI and Image Processing in Solving This Problem

* AI-powered systems, especially those using image processing and CNNs, can detect plant diseases with high accuracy.
* These models analyze leaf images to classify diseases or identify healthy plants in real-time.
* Automated detection allows for early intervention, reducing pesticide overuse and crop damage.

OBJECTIVE

The main objective of this project are:

1.Detect Plant Diseases: Accurately identify signs of diseases from leaf images using image processing and deep learning techniques.

2.Classify Disease Type: Determine the specific type of plant diseases from the leaf images.

**3.Ensure High Accuracy:** Minimize false detections while achieving reliable and consistent prediction performance.

PIPELINE

1.Data Collection and Data Loading

* Downloading the data and unzip it in google Colab.

2. Image Processing and Image Augmentation

* Resizing Images
* Generating new Images
* Normalize Pixels

1. Model Design

* CNN architecture

1. Training and Evaluation of the Model

* Use the train data to train the model
* Evaluate data using Accuracy, Precision, Recall.