LeafHealth AI

**DOMAIN:** PYTHON | AGRICULTURE | AI | IMAGE PROCESSING

Overview -
LeafHealth AI is an AI-powered crop disease detection system designed to help farmers quickly identify plant diseases through leaf image analysis. Using **Deep Learning & Computer Vision**, it provides accurate and real-time results, enabling early intervention to prevent crop loss.

Github -
https://github.com/JJIShanid/LeafHealth-AI

Key Features

▶ AI-powered plant disease detection.

▶ Mobile-friendly interface for easy access .

▶ Real-time disease diagnosis with **95% accuracy.**

▶ Supports **38+ plant varieties.**

▶ Instant results with deep learning-based predictions

▶ User-friendly web interface powered by **Streamlit.**
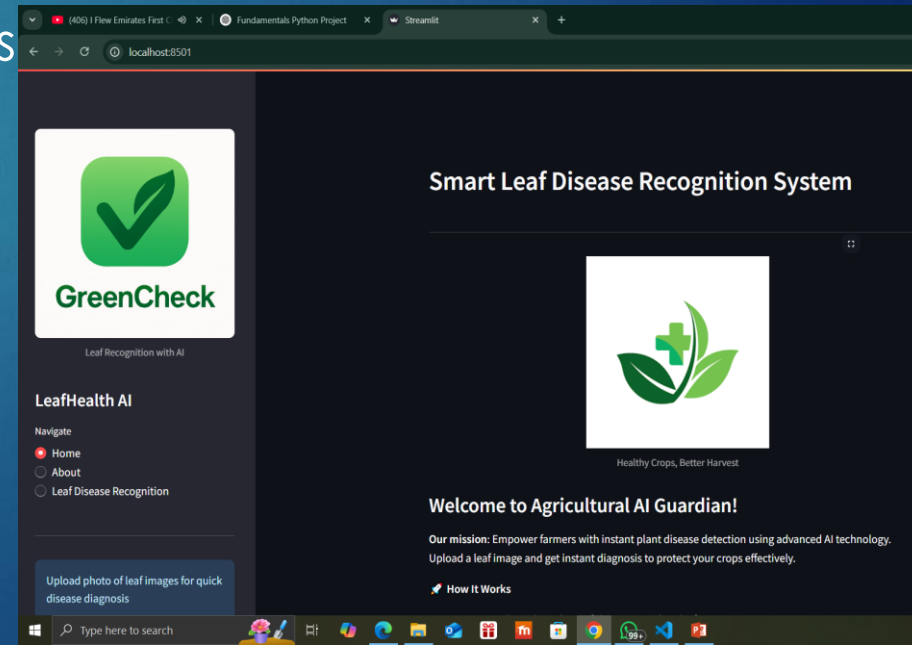
Challenges Faced

- Improving model accuracy was difficult due to class imbalance and noise in image data

- Optimizing CNN architecture required experimenting with deeper convolutional layers to enhance feature learning

- Adjusting model complexity while keeping training time reasonable was a key trade-off
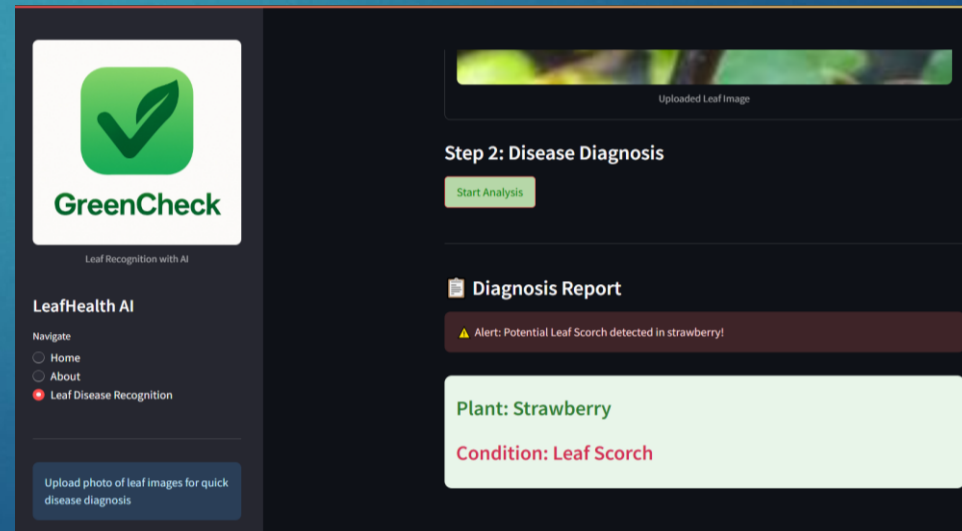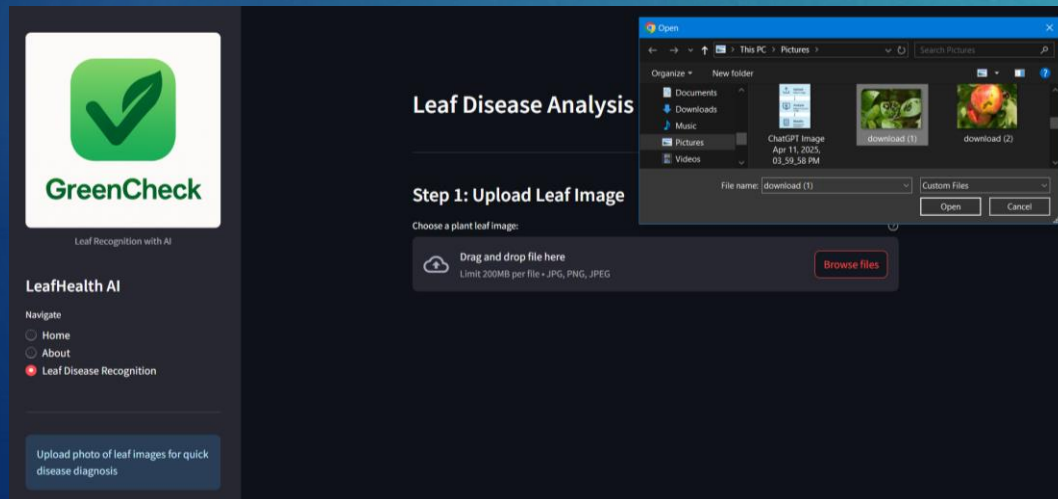
Python Concepts Used

▶ Variables, Functions, Loops, Conditions

▶ File Handling (image upload, preprocessing)

▶ Object-Oriented Programming (CNN model class)

▶ GUI Development with Streamlit (a Python-only tool)

▶ External Library Usage (pip install , requirements.txt)
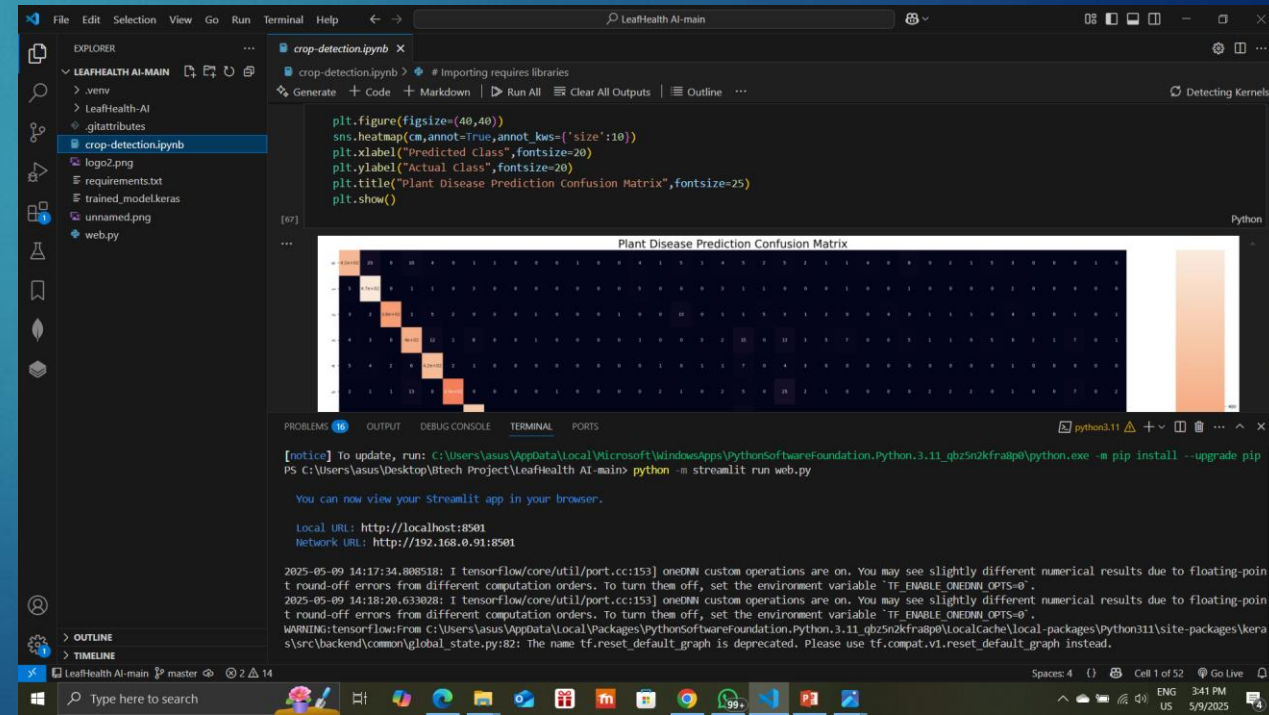
Dataset & Model Summary

- Dataset: Kaggle Plant Leaf Diseases Dataset (87K images)

- Preprocessing: Resizing, normalization, augmentation (Python + NumPy)

- Model: CNN built using Keras & TensorFlow in Python

- Trained and tested entirely in Jupyter Notebook

Program Flow Screenshot
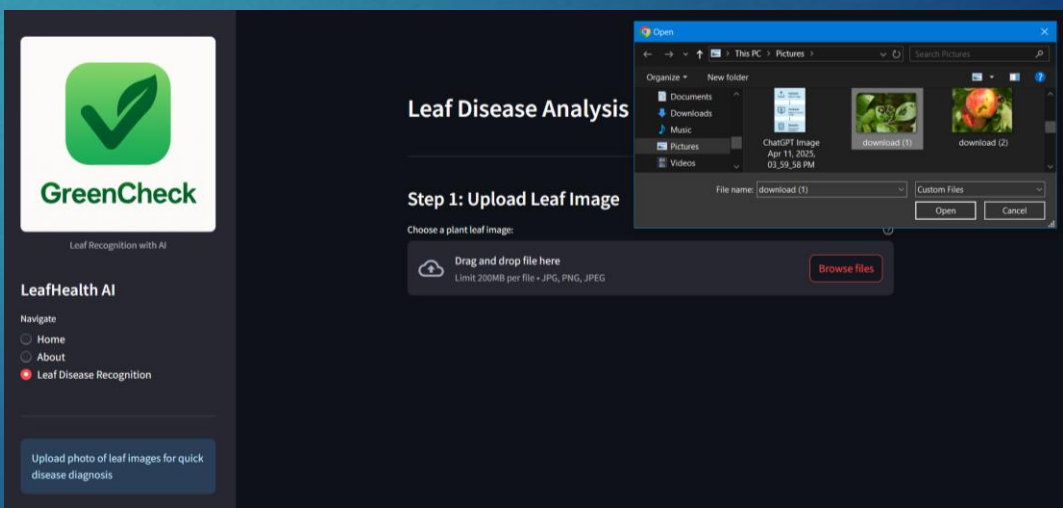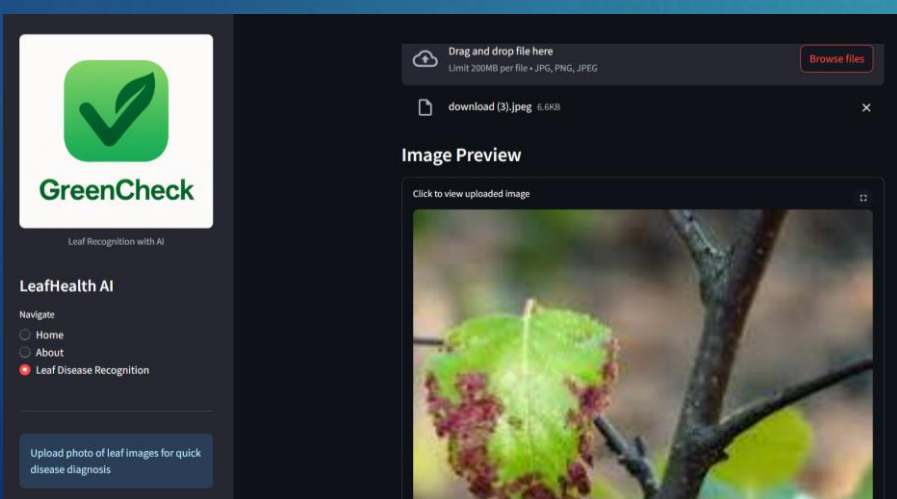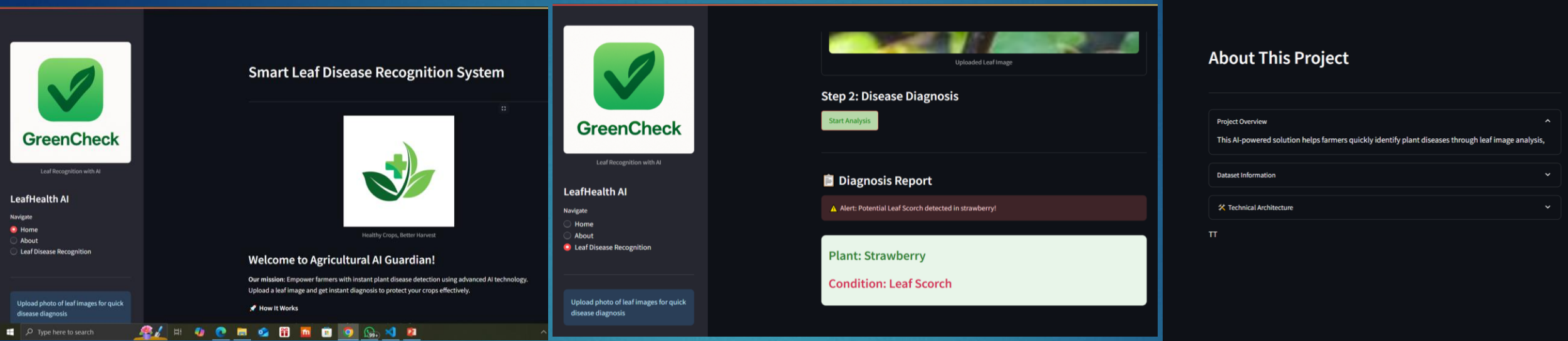
Summary

- Focused on problem-solving using core Python
- Integrated ML model with a beginner-friendly UI
- Combines practical agriculture use case with programming fundamentals
- A great example of real-world programming in Python

Thank You!

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