PHASE-5: PROJECT DEVELOPMENT

🎯 OBJECTIVE

- To code the project, integrate all modules, and ensure they function together seamlessly.

💻 TECHNOLOGY STACK USED

- • Python – For building the machine learning model and logic.
- • TensorFlow/Keras – For implementing transfer learning.
- • OpenCV – For image preprocessing and augmentation.
- • Streamlit – For creating an interactive web user interface.
- • Jupyter Notebook – For model prototyping and experimentation.

🛠️ DEVELOPMENT PROCESS

- • Collected and labeled image dataset of fresh and rotten fruits/vegetables.
- • Preprocessed the images: resizing, normalization, and augmentation.
- • Used a pre-trained CNN model (like MobileNet or ResNet) and fine-tuned it on the dataset.
- • Validated and tested model accuracy using a separate test set.
- • Developed a front-end UI using Streamlit and integrated it with the model.
- • Ensured all components worked together smoothly in the deployed application.

⚠️ CHALLENGES & FIXES

- • **Imbalanced Dataset:** There were more fresh images than rotten ones. This was solved using data augmentation to balance the classes.
- • **Low Initial Accuracy:** Initially, the model overfitted. We addressed this by tuning hyperparameters and adding dropout layers.
- • **Integration Issues:** Some issues occurred when integrating the model with Streamlit. This was fixed by updating libraries and using proper format conversions.
- • **Slow Loading Time:** The model took time to load in deployment. Optimized it by saving and loading models in `.h5` format and reducing model size.