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Predicting Fruit Freshness Using Deep Learning – Your Turn to Build the Next Model

Imagine you're working as a junior data scientist for a sustainability-focused startup. Each year, grocery stores discard thousands of pounds of fruit due to inconsistent freshness checks. Management wants a fast, reliable, automated solution—and you've been tasked with building the first prototype.

In this case study, you will step into the role of the lead model developer and build a computer vision classifier that predicts fruit freshness using real images. You will explore dataset organization, train/validation/test splitting, transfer learning using ResNet-50, and evaluate your model's performance on unseen images.

Your mission is to take a raw image dataset and produce a working freshness classification system. You will experiment with data preprocessing, compare model behaviors, and justify your modeling decisions as if delivering a recommendation to your team. The goal is not to achieve perfection—it is to show that you can think like a data scientist. Along the way, you'll develop practical experience with handling real-world image datasets, working with modern deep learning frameworks, and making evidence-based modeling decisions. The goal is to give you confidence and intuition for projects you'll encounter later in your career.

By the end, you will deliver a short report and working code that demonstrates your ability to train a deep learning classifier using modern techniques.

GitHub Repository: https://github.com/AndyyyPhan/DS4002-Case-Study