**PROBLEM STATEMENT:**

**Smart Sorting: Transfer Learning for Identifying Rotten Fruits and Vegetables**

**In the agricultural and food distribution industries, a significant percentage of fruits and vegetables are wasted due to delayed or inaccurate identification of spoiled produce. Manual sorting is time-consuming, labor-intensive, and prone to human error. Moreover, large-scale operations lack cost-effective and scalable methods for real-time quality control.**

**To address this challenge, there is a need for an intelligent, automated system that can accurately differentiate between fresh and rotten fruits and vegetables using computer vision. Leveraging transfer learning, we aim to develop a machine learning model that can quickly and reliably classify produce quality from images, reducing waste and improving sorting efficiency in the supply chain.**

**USE CASES:**

**Scenario 1: Smart Sorting System in Agricultural Warehouses**

**In a large cold-storage warehouse, produce is brought in bulk from farms. A smart camera setup captures images of each item on a conveyor belt. The trained model classifies them as “fresh” or “rotten.” Based on the result, a robotic arm directs rotten produce to a waste bin and fresh ones to the packaging line — reducing human labor and post-harvest waste.**

**Scenario 2: Quality Control in Supermarkets**

**A retail chain installs a mobile scanning unit or smart cameras in storage and display areas. Before opening hours, staff scan the crates, and the system flags items that are starting to rot. This helps maintain visual appeal for customers and minimizes spoilage before sale.**

**Scenario 3: Automated Checkpoints in Food Processing Units**

**A fruit juice manufacturer installs a smart camera system at the fruit input station. The system identifies and filters out rotten fruits using image classification, ensuring only high-quality fruits are crushed, maintaining food safety and product quality.**

**Prerequisites**

* To complete this project, you must require the following software, concepts, and packages
  + Anaconda Navigator:
    - Refer to the link below to download Anaconda Navigator
  + Python packages:
  + Type “pip install numpy” and click enter.
  + Type “pip install pandas” and click enter.
  + Type “pip install scikit-learn” and click enter.
  + Type ”pip install matplotlib” and click enter.
  + Type ”pip install scipy” and click enter.
  + Type ”pip install seaborn” and click enter.
  + Type ”pip install tenserflow” and click enter.
  + Type “pip install Flask” and click enter.