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TEAM ID	LTVIP2026TMIDS90622
PROJECT NAME	SMART SORTING : TRANSFER LEARNING FOR IDENTIFYING ROTTEN FRUITS AND VEGETABLES
MAXIMUM MARKS	2 MARKS

CHAPTER-2
2.1 PROBLEM STATEMENT

Food spoilage is a major issue in the agricultural supply chain, retail markets, and household storage systems. A significant percentage of fruits and vegetables are wasted due to delayed detection of spoilage, improper sorting, and human error during manual inspection. Traditional sorting methods rely heavily on visual inspection by workers, which is time-consuming, inconsistent, labor-intensive, and prone to inaccuracies—especially when dealing with large volumes.

Rotten or spoiled produce often exhibits subtle visual changes such as discoloration, mold growth, texture degradation, or surface damage. Detecting these variations manually can be difficult, particularly in early stages of spoilage.

To address this issue, there is a need for an intelligent, automated system capable of accurately classifying fresh and rotten fruits and vegetables in real time. By leveraging **transfer learning** with pre-trained deep learning models (e.g., ResNet, MobileNet, VGG16, EfficientNet), the system can utilize previously learned image features to improve classification performance even with limited dataset availability.

Therefore, the problem addressed in this project is the development of an intelligent, automated fruit and vegetable identification system using transfer learning techniques. The system should be capable of accurately classifying different types of fruits and vegetables from input images in real-time while handling variations in lighting, background, and object orientation.

The proposed system aims to:

✓ Reduce dependency on manual labor in sorting processes.
✓   Improve classification accuracy and reliability.
✓   Minimize training time and computational requirements using transfer learning.
✓   Enable real-time identification suitable for industrial applications.
✓   Provide a scalable solution that can be extended to additional categories.