Project Phase -2

Date	12 february 2026
Team ID	LTVIP2026TMIDS74869
Project Name	Transfer Learning for Identifying Rotten Fruits and Vegetables
Maximum Marks	4 Marks

1.Technical Architecture

The NutriGaze system follows a layered machine learning web application architecture. The frontend web interface allows users to upload fruit or vegetable images. The backend server processes the image, performs preprocessing, and sends it to the trained ML/CNN model for prediction. The prediction results are then returned to the frontend along with a confidence score and displayed to the user.

The system consists of three main layers:

- **Presentation Layer (Frontend) – Handles user interaction and image upload.**
- **Application Layer (Backend API) – Manages preprocessing, model inference, and response handling.**
- **Data & Model Layer – Stores trained model, dataset, logs, and performance metrics.**

2. Components and Technologies

◆ **Frontend**

- **HTML, CSS, JavaScript**
- **Bootstrap (for responsive UI)**
- **Web-based dashboard for results**

◆ **Backend**

- **Python**
- **Flask (Web Framework)**
- **REST API for prediction**

◆ **Machine Learning**

- **TensorFlow / Keras or PyTorch**
- **CNN (Convolutional Neural Network) model**
- **Scikit-learn (for evaluation metrics)**

◆ **Data Processing**

- OpenCV (image processing)
- NumPy & Pandas

◆ Database / Storage

- Local file storage (images)
- SQLite / MySQL (optional for logs)

◆ Deployment

- Local server / Cloud deployment
- GitHub for version control

3. Application Characteristics

- Real-time image classification
- High accuracy freshness prediction
- User-friendly interface
- Scalable and modular architecture
- Secure image handling and validation
- Fast response time (<2 seconds per prediction)
- Easy retraining capability for improved accuracy
- Cross-platform accessibility (Web-based system)