Model Optimization and Tuning Phase Template

Date	20 November 2025
Team ID	740018
Project Title	Deepfruitveg:Automated Fruit And Vegetables Identification
Maximum Marks	10 Marks

Model Optimization and Tuning Phase

The Model Optimization and Tuning Phase of Deepfruitveg involves fine-tuning hyperparameters, adjusting learning rates, enhancing model architectures, and applying regularization techniques to improve accuracy and performance for fruit/vegetable identification.

Hyperparameter Tuning Documentation (8 Marks):

Model	Tuned Hyperparameters
Convolutional Neural Network (CNN)	- Learning Rate: 0.001 - Batch Size: 32 - Epochs: 50 - Dropout Rate: 0.3 - Optimizer: Adam - Activation Function: ReLU
Transfer Learning (VGG16, AlexNet)	- Learning Rate: 0.0001 - Epochs: 50 - Fine-tuning layers: Last 4 layers

	- Batch Size: 32 - Optimizer: Adam
MobileNet	- Learning Rate: 0.0005 - Batch Size: 32 - Epochs: 100 - Optimizer: Adam - Dropout Rate: 0.2 - Learning Rate Decay: 0.96

Final Model Selection Justification (2 Marks):

Final Model	Reasoning
ResNet (Residual Network)	ResNet offers the best balance of accuracy, efficiency, and scalability for automated fruit and vegetable identification, making it the optimal model.