

## Model Optimization and Tuning Phase

Date	7 February 2026
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Project Title	GreenSnap: A Vegetable Classifier
Maximum Marks	10 Marks

### Model Optimization and Tuning Phase

The Model Optimization and Tuning Phase involves improving our neural network models to get the best results. This means adjusting the model's settings, comparing how well different settings work, and explaining why we chose our final model.

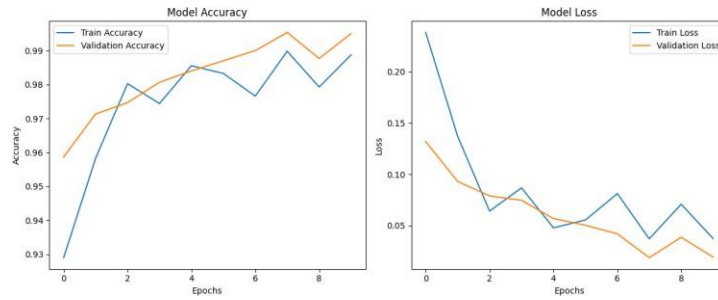
The neural network models were trained to classify images into the following 15 vegetable classes: [list of 15 vegetable classes to be specified]. The training dataset consisted of 1,200 labeled vegetable images across the 15 target classes. A separate dataset of 400 images was used for validation and final evaluation of the models.

### Hyperparameter Tuning Documentation (8 Marks):

Model	Tuned Hyperparameters
Model 1: MobileNetV2 (Baseline)	<p>Learning Rate: We adjusted the learning rate, which controls how much the model learns from its mistakes. We tried different learning rates to find one that helps the model learn effectively without becoming unstable.</p> <p>Batch Size: We changed the batch size, which is the number of images the model processes at once before updating its knowledge. We tested different batch sizes to balance speed and memory usage.</p>

Model 2:  
 MobileNetV2  
 (Optimized)

**Learning Rate:** We made finer adjustments to the learning rate, building on what we learned from Model 1, to see if we could improve performance further.



**Batch Size:** We used the best batch size from Model 1.

**Final Model Selection Justification (2 Marks):**

Final Model	Reasoning
Model 2: MobileNetV2 (Optimized)	We selected Model 2 as our final model because it demonstrated a significant improvement in validation accuracy compared to Model 1, achieving 88.36% compared to Model 1's best of 84.59%