**AI-Powered Nutrition Analyzer For Fitness Enthusiasts**

|  |  |
| --- | --- |
| Date |  |
| Team ID | SWTID1749893823 |
| ProjectTitle | AI-Powered Nutrition Analyzer For Fitness Enthusiasts |
| Maximum Marks | 6 Marks |

**Model Optimization and Tuning Phase**

The Model Optimization and Tuning Phase involves refining neural network models for peak performance. It includes optimized model code, fine-tuning hyperparameters, comparing performance metrics, and justifying the final model selection for enhanced predictive accuracy and efficiency.

**Hyperparameter Tuning Documentation (8 Marks):**

|  |  |
| --- | --- |
| **Model** | **Tuned Hyperparameters** |
| VGG16 | In the model, include\_top=False removes VGG16’s original classifier to allow custom layers. base\_model.trainable=False freezes pre-trained layers to retain learned features. Dropout(0.3) prevents overfitting, and Dense(128) controls model complexity.  A screenshot of a computer program  AI-generated content may be incorrect. |
| **MobileNetV2** | Here’s a short paragraph explaining the key parameters in your MobileNetV2-based model:  In this model, include\_top=False removes MobileNetV2’s original classification layers so custom ones can be added. Setting base\_model.trainable=False freezes the pre-trained layers to keep learned features intact. Dropout(0.3) helps reduce overfitting, while Dense(128) defines the custom layer’s complexity for learning fruit classes effectively. |

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

|  |  |
| --- | --- |
| Final Model | Reasoning |
| MobileNetV2 | This model was chosen as the final optimized model due to its lightweight architecture, faster training time, and strong performance on image classification tasks with limited computational resources. |