**Model Optimization and Tuning Phase Template**

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| Date | 27 October 2024 |
| Team ID | 739652 |
| Project Title | Ai-Powered Nutrition Analyzer For Fitness Enthusiasts |
| Maximum Marks | 10 Marks |

**Model Optimization and Tuning Phase**

The Model Optimization and Tuning Phase for the Ai-Powered Nutrition Analyzer involved fine-tuning hyperparameters such as learning rate, batch size, and the number of convolutional layers. Techniques like early stopping, dropout, and data augmentation were applied to prevent overfitting and improve generalization. Grid search and random search were used to systematically explore the best configurations. Performance metrics such as accuracy, precision, recall, and F1 score were continuously monitored to assess improvements. The final optimized model achieved better balance between accuracy and computational efficiency.

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| **Model** | **Tuned Hyperparameters** |
| Model 1 |  |
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### Final Model Selection Justification (2 Marks):

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| **Final Model** | **Reasoning** |
|  | The reasoning behind the Ai-Powered Nutrition Analyzer For Fitness Enthusiasts is to provide a personalized and efficient solution for managing nutrition based on deep learning and computer vision technologies. By leveraging advanced models, such as convolutional neural networks (CNNs), the system can analyze meal images to classify and predict nutritional content accurately. This approach helps fitness enthusiasts make data-driven decisions to optimize their diets. |