Model Optimization and Tuning Phase

Date	18 February 2026
Team ID	LTVIP2026TMIDS65517
Project Title	Advancing Nutrition Science through GeminiAI – NutriGen
Maximum Marks	10 Marks

Model Optimization and Tuning Phase

Model Optimization and Tuning Phase in NutriGen focuses on improving the quality, safety, personalization accuracy, and nutritional relevance of AI-generated diet plans.

Since NutriGen uses a pre-trained Gemini model, no neural network training or backpropagation is performed. Instead, optimization is achieved through:

Health-focused prompt engineering

Controlled generation parameter tuning

Structured output formattingand parameter tuning.

Hyperparameter Tuning Documentation:

Model	**Tuned Hyperparameters**
Gemini Flash Lite	**Temperature:** Controls creativity of output (set to a moderate value for balanced creativity). **Top-p:** Limits token selection to the most probable tokens for coherent responses. **Top-k:** Restricts token sampling to reduce irrelevant content. **Max Output Tokens:** Ensures generated recipe blogs match the desired word count.

	Response Format: Set to plain text for easy display in the UI.

Final Model Selection Justification:

Final Model	**Reasoning**
Gemini Flash Lite (models/gemini-flash-latest)	Selected due to its fast inference speed, efficient resource usage, strong contextual understanding of structured health prompts, high-quality personalized nutrition generation, and seamless integration with real-time web applications like Streamlit.