Model Optimization and Tuning Phase

Date	16 February 2026
Team ID	LTVIP2026TMIDS84978
Project Title	Advancing Nutrition Science through GeminiAI – NutriAssist AI
Maximum Marks	10 Marks

Model Optimization and Tuning Phase

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

Since NutriAssist AI 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 2.5 Flash	Temperature: 0.6 (Balanced creativity)
	Top-p: 0.9 (Improves coherence)
	Top-k: 40 (Reduces irrelevant token sampling)
	Max Output Tokens: 2048 (Ensures complete nutritional analysis)
	Response Format: Markdown for structured UI display

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.