

## Model Optimization and Tuning Phase Template

Date	18 June 2025
Team ID	SWTID1749631993
Project Title	Restaurant Recommendation System
Maximum Marks	10 Marks

### Model Optimization and Tuning Phase

The Model Optimization and Tuning Phase involves refining machine learning 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 (6 Marks):

Model	Tuned Hyperparameters	Optimal Values
TF-IDF + Nearest Neighbors	n_neighbors, metric, algorithm	11, cosine, brute

### Performance Metrics Comparison Report (2 Marks):

Model	Baseline Metric	Optimized Metric
TF-IDF + Nearest Neighbors	Informal validation via cosine similarity	Final validation based on top-rated recommendations relevance

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

Final Model	Reasoning
TF-IDF + Nearest Neighbors	Chosen for its effectiveness in content-based filtering using textual cuisine similarity, no need for labeled data, and interpretable output for real users.