Model Development Phase Template

Date	27 May 2025
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Project Title	Restaurant Recommendation System
Maximum Marks	5 Marks

Model Selection Report:

Model	Description
Content-Based Filtering	Content-based filtering recommends restaurants by comparing user preferences (e.g., cuisine type, price range, dietary restrictions) with restaurant attributes. It focuses on similarities between items and the user's profile without relying on other users' data. This method is effective for users with unique tastes but may struggle with limited user profiles (cold start).
Collaborative Filtering	Collaborative filtering leverages the preferences of similar users to make recommendations. It uses historical ratings and reviews to identify patterns. This model is effective in discovering new items but can suffer from sparsity and cold start problems if data is limited.
Hybrid Recommendation Model	This combines content-based and collaborative filtering to overcome the limitations of each method. By integrating both user preference data and behavior of similar users, hybrid models improve recommendation accuracy, diversity, and scalability. It is particularly useful in scenarios with large, sparse datasets like restaurant recommendations.
Matrix Factorization	Matrix factorization techniques decompose the user-item interaction matrix into latent features, capturing underlying patterns in user preferences. Singular Value Decomposition (SVD) is a common approach. It is computationally efficient and works well for large datasets but requires enough ratings.
Deep Learning (Neural Networks)	Neural networks can be used to build recommendation systems by learning complex, non-linear relationships between users and restaurants from rich feature sets including reviews, preferences, and metadata. While powerful, they require large datasets and are computationally intensive.

Conclusion:

Model Selected	
Hybrid Recommendation Model	The hybrid model was selected because it addresses the limitations of both content-based and collaborative filtering approaches. It effectively handles the cold start and sparsity issues by integrating multiple data sources such as user profiles, restaurant attributes, and behavioral data. This results in more personalized, diverse, and accurate recommendations, making it highly suitable for a restaurant recommendation system with varying user preferences and data availability.