Project Initialization and Planning Phase

Date	27-07- 2025
Student Name	Aarati Patil
Project Title	Restaurant Recommendation System
Maximum Marks	3 Marks

Project Proposal (Proposed Solution):

This project proposes the development of a recommendation engine that utilizes user behavior data, location, and cuisine preferences to suggest suitable restaurants. It integrates collaborative filtering and content-based methods, enhanced with user sentiment analysis from reviews. This solution is aimed at improving dining experiences and helping businesses better target customer needs.

Project Overview

Objective	To build an intelligent restaurant recommendation system that delivers personalized suggestions by analyzing user ratings, preferences, and review sentiments using machine learning techniques.
Scope	The project includes data collection from public datasets (e.g., Yelp, Zomato), preprocessing, feature engineering, and model training using collaborative and content-based filtering. Sentiment analysis will be applied to enhance prediction quality. A basic web interface will allow users to input preferences and view suggestions. The system is limited to English-language reviews and urban restaurants.

Problem Statement

Description	With an overwhelming number of dining options, users often struggle to find restaurants that match their taste and expectations. Current recommendation systems are either too generic or ignore key factors like sentiment or contextual cues.
Impact	A personalized recommendation engine can improve user satisfaction, increase customer retention for restaurants, and minimize decision fatigue by offering tailored choices.

Resource Type	Description	Specification/Allocation
Hardware		

Computing Resources	CPU/GPU specifications, number of cores	1 x NVIDIA RTX 3060 GPUs

Memory	RAM specifications	16 GB RAM
Storage	Disk space for data, models, and logs	500 GB SSD

Proposed Solution

Approach	This project uses collaborative filtering, content-based filtering, and sentiment analysis of review texts. TF-IDF and NLP techniques will be employed to extract sentiment and context from user reviews. Model performance will be evaluated using precision, recall, and RMSE.
Key Features	Personalized recommendations based on preferences, Sentimentenhanced filtering, Web-based interface using Flask and visual insights using Matplotlib and Seaborn

Resource Requirements

Software		
Frameworks	Python frameworks	Python
Libraries	Additional libraries	scikit-learn, pandas, numpy, nltk, Flask, matplotlib, seaborn, plotly
Development Environment	IDE, version control	Jupyter Notebook, Git
Data		
Data	Source, size, format	Yelp, Zomato open datasets