Restaurant Analysis & Recommendation Engine

This repository contains a multi-faceted project that analyzes restaurant data to predict ratings, recommend dining options, and perform location-based analysis.

Table of Contents

Project Overview

This project applies data analysis and machine learning techniques to a restaurant dataset. It's structured into three main tasks, each exploring a different aspect of the data. The project aims to derive actionable insights, from predicting a restaurant's success to helping users find their next favorite dining spot.

Tasks

Task 1: Predict Restaurant Rating 🌟

This task focuses on building a machine learning model to predict a restaurant's aggregate rating.

- **Model**: A `Linear Regression` model is used to predict the numerical rating.
- **Features**: The model is trained on features like `Price range`, `Votes`, `Has Table booking`, and `Has Online delivery`.
- **Evaluation**: Model performance is measured using **Mean Squared Error (MSE)** and **R-squared (R^2)**.

File: `Predict_Restaurant_Rating.ipynb`

Task 2: Restaurant Recommendation System 👨‍🍳

This task involves creating a system to recommend restaurants based on user preferences.

- **Methodology**: A **content-based filtering** approach is implemented.
- **Criteria**: The system recommends restaurants based on the user's preferred **cuisine** and **price range**.
- **Ranking**: Recommendations are sorted by `Aggregate rating` and `Votes` to ensure high-quality suggestions.

File: `Restaurant_Recommendation.ipynb`

Task 3: Location-Based Analysis 🗺️

This task performs a geographical analysis of the restaurants in the dataset.

- **Analysis**: Explores the spatial distribution of restaurants and analyzes key metrics by city.
- **Metrics**: The analysis includes the concentration of restaurants, average ratings, and average price ranges by city.

File: `Location-based_Analysis.ipynb`

Dataset

The project uses a single dataset (`Dataset .csv`) which contains various attributes of restaurants, including:

- Restaurant Name, City, Locality
- Cuisines, Price range
- Aggregate rating, Votes
- Latitude, Longitude

Installation & Usage

To run these analyses, follow these steps:

1. Clone the repository:

git clone https://github.com/your-username/your-repository-name.git

2.Install the required libraries:

pip install pandas numpy matplotlib seaborn scikit-learn jupyter

3.**Launch Jupyter Notebook**: Navigate to the cloned directory and run the following command to open the notebooks.

jupyter notebook

Key Visualizations

Feature Importance: Identifies the key drivers behind restaurant ratings.

Geographical Distribution: Maps out restaurant locations to find dining hotspots.

Cuisine Popularity: Highlights the most commonly available cuisines.