Cognifyz Technologies

Task 1: Predict Restaurant Ratings:

ReadMe:

About the Project:
This project aims to predict the aggregate rating of restaurants using a Random Forest Regressor model. The dataset includes various features such as location, cuisines, price range, and other metadata extracted from restaurant platforms.
This task was developed as part of an internship assignment to demonstrate skills in data preprocessing, machine learning, and analysis.

Features

- Reads and cleans raw restaurant dataset
- Encodes categorical features using Label Encoding
- Drops redundant columns and fills missing values
- Trains a Random Forest Regressor on the cleaned dataset
- Predicts aggregate ratings and evaluates the model using MSE and R^2 score
- Visualizes feature importance

Tech Stack

- **Language:** Python
- **Libraries:**
  - pandas, numpy – Data processing
  - matplotlib, seaborn – Visualization
  - sklearn – Model building and evaluation

Dataset
The dataset used is titled **"Dataset.csv"** and includes features like:

- Country Code
- City
- Cuisines
- Price range
- Currency
- Has Online Delivery

- Aggregate Rating *(Target)*

Note: Columns like Restaurant ID, Name, Address, etc., were dropped during preprocessing.

Installation

1. Clone the repository or download the .py file
2. Make sure the dataset is in the same directory
3. Install required libraries:

```
pip install pandas numpy scikit-learn matplotlib seaborn
```

Model Details

- Model Used: RandomForestRegressor
- Data Split: 80% training, 20% testing
- Random State: 42

Evaluation Metrics

- **Mean Squared Error (MSE):** Calculated and scaled by 100
- **R^2 Score:** Measures prediction accuracy

Feature Importance

The model uses feature importance to visualize the most impactful factors contributing to restaurant ratings, displayed via a horizontal bar plot using matplotlib.

Results

- The Random Forest model shows strong performance in predicting restaurant ratings.
- The most influential features include:
  - Online Delivery availability
  - Price range
  - Country and City codes

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