

Project Title	Building a Zomato-like Restaurant Recommendation and Price Prediction System
Skills take away From This Project	<ul style="list-style-type: none"> • AWS S3 and RDS usage for data storage and retrieval • Data structuring and preprocessing • Machine learning model development for price prediction • Web application development using Streamlit • Deployment of applications on AWS EC2 • Interactive data visualization • Building recommendation systems
Domain	Restaurant Recommendation, Machine Learning, Data Analytics, Web Application Development

Problem Statement:

Develop a web-based application similar to Zomato, which allows users to select restaurants based on location and cuisine and provides average price predictions for two people dining based on various features. The project should include data structuring, model building, and interactive visualizations, and the web app should be hosted on AWS EC2.

Business Use Cases:

- **Restaurant Discovery:** Suggesting restaurants based on user preferences for location and cuisine.
- **Price Estimation:** Predicting the average cost for two people based on restaurant features such as location, cuisine, and facilities.
- **Personalized Recommendations:** Providing users with restaurant recommendations based on features like ratings, location, and cuisines.
- **Operational Insights:** Offering insights for restaurant owners on pricing trends, ratings, and user preferences.

Approach:

1. Data Management:

- a. Upload the provided Zomato dataset (in JSON format) into an AWS S3 bucket.
- b. Pull the dataset from S3 and preprocess it for structuring.
- c. Store the structured data into AWS RDS in SQL format.

2. Model Development:

- a. Extract relevant features from the dataset (e.g., location, cuisine, average cost, ratings).
- b. Build a machine learning model to predict the average cost for two people based on these features.
- c. Train, evaluate, and save the model for deployment.

3. Web Application:

- a. Build an interactive Streamlit web application.
- b. The app should display restaurant options based on user input (location, cuisine) and predict the average price for two people.
- c. Add interactive visualizations for restaurant ratings, cuisines, and price range distribution.

4. Deployment:

- a. Host the Streamlit web application on an AWS EC2 instance for public access.

Results:

- **Machine Learning Model:** A model that predicts the average cost for two people based on features like location, cuisine, and restaurant ratings.
- **Streamlit Web App:** An interactive, user-friendly web interface that provides restaurant recommendations and price predictions.
- **Visualizations:** Graphical representations of restaurant distributions, price ranges, and user preferences.
- **Deployment:** A fully functional, publicly accessible web application hosted on AWS EC2

Project Evaluation metrics:

- **Prediction Accuracy:** RMSE, MAE for the average price prediction model.
- **User Engagement:** Feedback and interaction with the recommendation system.

- **Application Performance:** Response time, uptime, and smoothness of interaction in the deployed web app.
- **Data Insights:** Correctness of the restaurant suggestions and price predictions.

Technical Tags:

- **Technologies:** Python, AWS S3, AWS RDS, AWS EC2, Streamlit
- **Libraries:** pandas, scikit-learn, matplotlib, seaborn, SQLAlchemy, boto3
- **Machine Learning:** Regression models (Linear Regression, Random Forest)
- **Data Processing:** JSON handling, data structuring, SQL
- **Visualization:** Interactive plots using Streamlit and matplotlib

Data Set:

Source: [Zomato dataset in JSON format](#)

Variables: Restaurant ID, Name, Location, Cuisine, Ratings, Average Cost for Two, Price Range, Features (Table Booking, Online Delivery, etc.), Longitude, Latitude.

Data Set Explanation:

The dataset contains various details about restaurants, including location (city, locality), cuisine types, ratings, and average cost for two people. Preprocessing includes:

- Handling missing or inconsistent values.
- Converting JSON into structured SQL tables.
- Extracting relevant features for price prediction and recommendation systems.

Project Deliverables:

- **Source Code:** Python scripts for data processing, model training, and the web app.
- **Documentation:** Detailed explanation of the approach, dataset, and methodology.
- **Model:** Trained machine learning model for price prediction.
- **Streamlit App:** A deployed web application on AWS EC2.

- **Visualization:** Interactive plots showing restaurant data insights.
- **SQL Database:** Structured restaurant data in AWS RDS.

Project Guidelines:

- **Coding Standards:** Follow PEP8 guidelines for Python code. Ensure modularity and readability.
- **Version Control:** Use GitHub for version control and collaboration. Commit changes regularly.
- **Testing:** Implement unit tests for data preprocessing and machine learning models.
- **Documentation:** Clearly document the code, methods, and functions.

Timeline:

The deadline for this project is two weeks, starting from 27/09/2024 to 11/09/2024. All project deliverables must be submitted by the end of this period.

PROJECT DOUBT CLARIFICATION SESSION (PROJECT AND CLASS DOUBTS)

About Session: The Project Doubt Clarification Session is a helpful resource for resolving questions and concerns about projects and class topics. It provides support in understanding project requirements, addressing code issues, and clarifying class concepts. The session aims to enhance comprehension and provide guidance to overcome challenges effectively.

Note: Book the slot at least before 12:00 Pm on the same day

Timing: Tuesday, Thursday, Saturday (5:00PM to 7:00PM)

Booking link : <https://forms.gle/XC553oSbMJ2Gcfug9>

LIVE EVALUATION SESSION (CAPSTONE AND FINAL PROJECT)

About Session: The Live Evaluation Session for Capstone and Final Projects allows participants to showcase their projects and receive real-time feedback for improvement. It assesses project quality and provides an opportunity for discussion and evaluation.

Note: This form will Open on Saturday and Sunday Only on Every Week

Timing: Monday-Saturday (11:30PM to 12:30PM)

Booking link : <https://forms.gle/1m2Gsro41fLtZurRA>

