Hotel Booking Analytics & RAG System

Introduction

This system processes hotel booking data, extracts insights,

and enables Retrieval-Augmented Question Answering (RAG).

It provides analytics and a natural language Q&A interface.

Data Preprocessing

The dataset is cleaned by handling missing values, converting

dates to a structured format, and filling missing numerical fields.

Analytics Implemented

1. Revenue trends over time.

2. Booking cancellation rate.

3. Geographical distribution of bookings.

4. Booking lead time distribution.

Retrieval-Augmented Q&A

A sentence-transformer model is used to convert booking records into

embeddings, allowing for natural language queries about booking data.

API Endpoints

- POST /analytics : Returns key analytics reports.

- POST /ask : Processes natural language questions and retrieves relevant data.

Sample Output

Example Question: 'What is the total revenue for July 2017?'

Response: {'Total Revenue': 271588.06}

Conclusion

This system combines structured analytics with AI-driven

natural language querying to provide an interactive hotel booking analysis platform.