**Weekly Report 7**

Date:

## Introduction

The exponential growth of travel-related data and user-generated content has created new opportunities for intelligent systems to enhance travel planning experiences. In this context, our project focuses on designing and implementing a **Travel Destination Recommendation System** that utilizes artificial intelligence and data science to deliver personalized travel suggestions.

The core idea is to assist users in discovering destinations aligned with their preferences, previous travel history, and current trends. The system is built on a **hybrid recommendation model**, integrating three strategies:

1. **User-Based Filtering**: Leverages historical behavior of users and applies collaborative filtering to identify similar users. Destinations liked by similar users are recommended.
2. **Content-Based Filtering**: Utilizes features of destinations — such as type, state, and best time to visit — and applies cosine similarity to recommend destinations with similar characteristics.
3. **Popularity-Based Filtering**: Suggests destinations based on aggregated user reviews and overall popularity metrics.

The project uses several cleaned and merged datasets, including:

* Expanded\_Destinations.csv: Contains details of locations like name, state, type, and popularity.
* Final\_Updated\_Expanded\_Reviews.csv: Contains user reviews and ratings.
* Final\_Updated\_Expanded\_UserHistory.csv: Tracks user interactions with destinations.
* Final\_Updated\_Expanded\_Users.csv: Contains user demographic and profile information.

For the application interface, we used **Streamlit**, which enables fast deployment of machine learning-powered web applications. Users can explore recommendation types, view top destinations, and interact with real-time data visualizations.

To ensure accurate insights, **matplotlib** and **seaborn** were used for plotting rating distributions and type-wise destination patterns. Additionally, **cosine similarity** was employed for generating similarity matrices both in user and item dimensions.

This introductory phase successfully set up the development environment, integrated and cleaned datasets, implemented core recommendation logic, and deployed a working prototype. The foundation is now ready for further development phases, including user feedback integration, mobile responsiveness, and advanced recommendation techniques such as deep learning models.

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Sign of Faculty Incharge