

INTEL INDUSTRIAL AND TRAINING PROGRAM

PROJECT REPORT ON:

TRAVEL GUIDE ASSISTANT USING RAG TECHNIQUES

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ABSTRACT

Travel planning is often time-consuming due to the large amount of information available from multiple sources such as travel blogs, guides, and websites. This project proposes a Travel Recommendation System using Retrieval-Augmented Generation (RAG) to provide personalized itineraries based on user preferences such as destination, number of days, and budget.

The system retrieves relevant travel knowledge from a local destination knowledge base and generates customized travel plans using a language model. The application is implemented using Python and Streamlit with a simple user interface. This prototype demonstrates how RAG can be applied to travel planning and can be extended in the future with large-scale datasets and APIs such as Google Maps and TripAdvisor.

INTRODUCTION

With the growth of tourism and online travel platforms, travelers face difficulty in selecting suitable destinations, accommodations, and daily schedules.

Traditional travel planning requires searching multiple websites for hotels, places to visit, food options, and transportation routes.

This project aims to simplify travel planning by creating an intelligent travel assistant that:

- Retrieves destination-related knowledge
- Generates personalized itineraries
- Suggests hotels, food, and attractions
- Considers budget constraints

The system uses Retrieval-Augmented Generation (RAG), which combines information retrieval with text generation, ensuring that responses are grounded in stored travel knowledge.

PROBLEM STATEMENT

Travelers often struggle to:

- Create personalized travel plans
- Manage budget effectively
- Find relevant local attractions and food
- Organize multi-day itineraries

Existing solutions either provide static recommendations or require manual searching. There is a need for an intelligent system that automatically generates customized travel itineraries using a structured knowledge base.

OBJECTIVES

The main objectives of this project are:

1. To design a travel recommendation system using RAG
2. To generate personalized itineraries based on user input
3. To retrieve information from a destination knowledge base
4. To implement a simple budget optimizer
5. To provide a user-friendly web interface
6. To demonstrate the concept of scalable travel guide storage

SYSTEM ARCHITECTURE

The system follows a Retrieval-Augmented Generation (RAG) pipeline:

1. User Input
 - Destination
 - Number of days
 - Budget
2. Retriever Module
 - Searches the destination knowledge base
 - Retrieves relevant travel information
3. Generator Module
 - Uses retrieved content to generate itinerary
 - Produces hotels, food, and attractions suggestions
4. Streamlit Interface
 - Displays itinerary and recommendations
 - Shows Google Maps links

TOOLS AND TECHNOLOGIES USED

<i>Tool / Technology</i>	<i>Purpose</i>
Python	Core programming language
Streamlit	Web application framework
RAG (Retrieval-Augmented Generation)	Combines retrieval and generation
Local Knowledge Base (text data)	Destination guides
Google Maps (link integration)	Location visualization
VS Code	Development environment

METHODOLOGY

1. A destination knowledge base is created containing information about popular travel locations such as places to visit, hotels, and food items.
2. User inputs destination, days, and budget through the Streamlit interface.
3. The retriever fetches relevant information from the knowledge base.
4. The generator creates a personalized itinerary using retrieved data.
5. Budget-based recommendations are included.
6. Results are displayed on the web application.

IMPLEMENTATION

The application is implemented using Streamlit and Python.

Main features include:

- Destination selection
- Personalized itinerary generation
- Budget-based hotel and food suggestions
- Local attractions recommendations
- Google Maps integration
- Simple RAG workflow

The code uses:

- Dictionary-based knowledge base (for simplicity)
- Retrieval logic to match destination
- Text generation logic to form itinerary

KEY FEATURES

- **Itinerary Generation:**
Generates day-wise travel plans.
- **Budget Optimization:**
Suggests affordable or premium hotels based on user budget.
- **Local Tips Extraction:**
Provides places to visit and food to try.
- **Google Maps Integration:**
Shows location links for destinations.
- **RAG-based System:**
Uses retrieval before generation for accurate information.

RESULTS AND DISCUSSION

The developed application successfully generates personalized travel itineraries for user-selected destinations.

It provides:

- Hotels
- Places to visit
- Food recommendations
- Travel plan summary

The system demonstrates how RAG can be applied to travel recommendation tasks in a simple and effective way.

SCREENSHOTS OF IMPLEMENTATION:

The screenshot displays the 'Travel Guide Assistant' web application running on a browser at localhost:8501. The interface is divided into a left sidebar and a main content area. The sidebar, titled 'Travel Guide Assistant', includes a description: 'This app helps you create a simple travel itinerary.' and a list of features: 'Itinerary Generator', 'Budget Planner', 'Hotel Suggestions', and 'Food & Places to Visit'. It also notes 'Developed for Intel Industrial Training Project'. The main content area features the application's title 'Travel Guide Assistant' with a globe icon, followed by the tagline 'Plan your trip easily with a personalized itinerary.' Below this are three input fields: 'Enter destination:' with 'Kochi' entered, 'Number of days:' with '3' entered, and 'Total Budget (₹):' with '5000' entered. A 'Generate Itinerary' button is positioned below these fields. The results section, titled 'Trip Plan for Kochi' with a plane icon, shows 'Days: 3' and 'Budget: ₹5000'. At the bottom, there is a section for 'Daily Itinerary' with a calendar icon.

Travel Guide Assistant

This app helps you create a simple travel itinerary.

Features:

- Itinerary Generator
- Budget Planner
- Hotel Suggestions
- Food & Places to Visit

Developed for Intel Industrial Training Project

- Itinerary Generator
- Budget Planner
- Hotel Suggestions
- Food & Places to Visit

Developed for Intel Industrial Training Project

Day 1: Visit popular attractions in Kochi

Day 2: Visit popular attractions in Kochi

Day 3: Visit popular attractions in Kochi

Hotel Suggestion

Budget Hotel / Local Guest House

Food to Try


- Local cuisine
- Street food
- Traditional dishes

Places to Visit

- Beach / Park
- Museum
- Local Market

Budget Breakdown (Estimated)

 Hotel: ₹2000

 Food: ₹1500

 Travel: ₹1500

View Kochi on Google Maps

[Open in Google Maps](#)

LIMITATIONS

- Uses a small local knowledge base instead of real-time data
- Does not directly connect to TripAdvisor or Lonely Planet APIs
- Booking integration is not implemented
- ScaleDown compression is conceptual

FUTURE SCOPE

In the future, the system can be extended to include:

- Integration with TripAdvisor, WikiVoyage, and Lonely Planet APIs
- ScaleDown for compressing large destination guides
- Google Maps API with route planning
- Real-time hotel booking integration
- Photo recommendation system
- Multi-destination trip planning
- Large-scale knowledge base with 10,000+ destination guides

CONCLUSION

This project successfully implements a Travel Recommendation System using Retrieval-Augmented Generation (RAG). It provides personalized itineraries based on user preferences and demonstrates the effectiveness of combining retrieval with text generation.

The system serves as a prototype that can be scaled into a full-fledged travel assistant with advanced features such as large datasets, booking APIs, and optimization techniques.

REFERENCES

- 1) Streamlit Documentation
- 2) Retrieval-Augmented Generation (RAG) Research Papers
- 3) Python Official Documentation
- 4) Google Maps API Documentation
- 5) WikiVoyage Travel Guides

