

Travel Assistant – RAG + LangChain Application

Generative AI Applications with RAG and LangChain (IBM AI Engineering Specialization)
Full Project Documentation

1. Project Overview

1.1 Project Title

AI-Powered Travel Assistant with RAG and LangChain

1.2 Project Summary

This project builds an intelligent Travel Assistant chatbot capable of answering travel-related questions using a Retrieval-Augmented Generation (RAG) pipeline powered by LangChain and LLMs.

2. Project Goals & Objectives

Primary Objectives

- Develop an end-to-end RAG system.
- Build document ingestion, chunking, embedding, and retrieval.
- Create a LangChain RetrievalQA pipeline.

Secondary Objectives

- Streamlit UI.
- Retrieval evaluation.
- Optimize RAG parameters.

3. Project Planning

Phase 1 – Requirements & Research

Phase 2 – Data Preparation

Phase 3 – RAG Pipeline Development

Phase 4 – Application Development

Phase 5 – Testing & Evaluation

Phase 6 – Documentation & Deployment

4. Stakeholder Analysis

- Project Owner: Developer
- IBM/Coursera Instructors: Evaluators
- End Users: Travelers

5. System Architecture Overview

User → RAG Pipeline → Vector Store (FAISS) + LLM → Answer

6. Vector Database Design

Vector DB: FAISS

Embedding: Model-dependent (384–1536 dims)

Similarity: Cosine

7. UI/UX Design

Minimal UI with chat layout.

Includes chat bubbles, clean colors, and Streamlit interface.

8. Technology Stack

- LangChain
- FAISS
- LLMs (OpenAI or HF)
- Streamlit
- Python

9. Evaluation

Metrics:

- Precision@k
- Recall@k
- Hallucination checks

10. Conclusion & Future Enhancements

Achievements:

- Built working RAG Travel Assistant.

Future Enhancements:

- Add multilingual support
- Add real-time APIs

<https://github.com/YoussifShaaban98/DEPI-project>