Travel Assist AI Documentation

1. Introduction

Project Background

In today's busy and fast-paced life, everyone desires a quick escape in the form of a holiday. However, the overwhelming number of choices and the lack of personalized assistance make holiday planning a daunting task.

To address this, we have developed TravelAssist AI, a chatbot that combines the power of large language models (LLMs) and rule-based functions to ensure accurate and reliable travel recommendations.

Problem Statement

Given a dataset containing information about holiday packages (e.g., package name, destination, duration, sightseeing options, etc.), build a chatbot that:
- Parses the dataset.
- Provides accurate holiday recommendations based on user preferences.

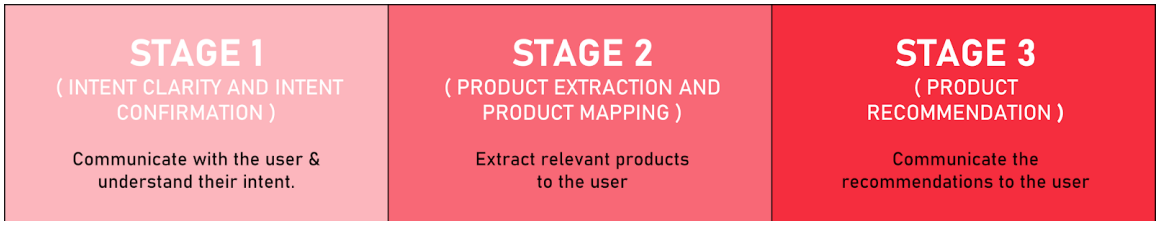
Dataset Details

The dataset is sourced from Kaggle:
MakeMyTrip Holiday Packages Dataset:
https://www.kaggle.com/datasets/promptcloud/travel-listing-from-makemytrip

- The original dataset contained 40,000+ records.
- For this project, we selected a subset of the data for better efficiency.

2. System Architecture

The chatbot is designed with three key stages, as depicted in the below diagram:



Chatbot Workflow

1. Stage 1: Intent Clarity & Confirmation
- The chatbot communicates with the user to understand their travel preferences.
- Uses Natural Language Processing (NLP) to interpret user queries.

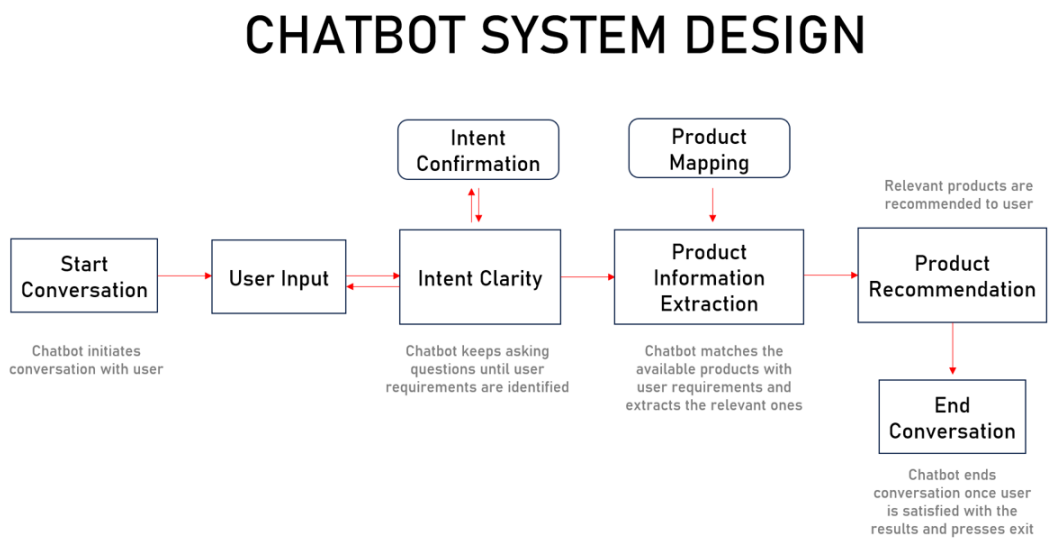
2. Stage 2: Product Extraction & Mapping

- Extracts relevant holiday packages from the dataset.
- Maps user requirements (e.g., budget, duration, destination) to the best-suited options.

3. Stage 3: Product Recommendation
- The chatbot recommends the best holiday packages.
- Provides a summary of each package and assists with booking.

System Flow Diagram

Refer to the system architecture diagram below.



3. Implementation Details

Key Components

1. Data Preprocessing:
- Cleaned and formatted dataset.
- Converted unstructured text into structured format.

2. Intent Recognition:
- Implemented using NLP-based keyword extraction and similarity matching.

3. Recommendation Algorithm:
- Uses a combination of rule-based filtering and ML models to find the best match.

4. Challenges Faced

1. Data Quality Issues
- Missing and inconsistent values in the dataset.

- Solution: Implemented data cleaning and preprocessing.

2. NLP Challenges
- Understanding user queries with different phrasing.
- Solution: Used Prompt engineering techniques to extract the data.

3. Scalability Concerns
- Handling large datasets efficiently.
- Solution: Considered subset of data.

5. Major Functions

1. initialize_conversation():
- Initializes the variable conversation with the system message..

2. get_chat_completions():
- Takes the ongoing conversation as the input and returns the response by the assistant.

3. moderation_check():
- Checks if the user's or the assistant's message is inappropriate. If any of these are inappropriate, it ends the conversation.

4. compare_holiday_with_user():
- Compares the user's profile with the different laptops and comes back with the top 3 recommendations.

5. intent_confirmation_layer():
- Evaluates if the chatbot has captured the user's profile clearly.

6. dictionary_present():
- Checks if the user's or the assistant's message is inappropriate. If any of these is inappropriate, it ends the conversation.

7. initialize_conv_reco():
- Initializes the recommendations conversation.

6. Future Enhancements

1. Function call API
- Equip methods with function call API to always produce similar structured output.

2. AI-powered Personalization
- Use machine learning to analyze past user behavior and provide better recommendations.

3. Voice-based assistant
- Extend TravelAssist AI to voice-based interactions.