TripTrek: Intelligent Travel Planning Using Using Gemini

Team Members:

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TripTrek is an AI-powered travel planning platform designed to revolutionize the way people plan and organize their trips. By leveraging advanced artificial intelligence algorithms, TripTrek offers users personalized travel itineraries tailored to their preferences, interests, and budget constraints. The platform combines machine learning models with rich travel data to provide users with comprehensive recommendations for accommodations, activities, dining options, transportation, and more. With TripTrek, travelers can say goodbye to the hassle of manually researching and organizing every aspect of their trip and instead enjoy a seamless and stress-free travel planning experience.

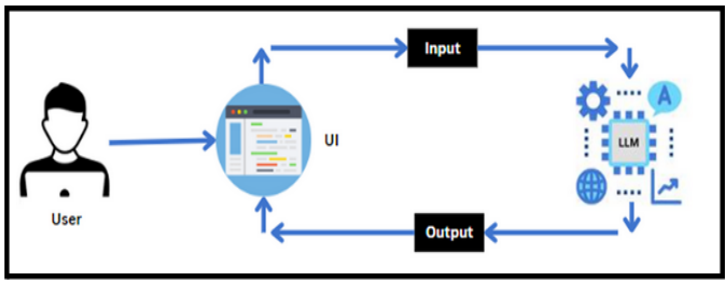
Scenario 1: Family Vacation Coordination
TripTrek helps families plan their vacations by taking user inputs such as destination and number of days to generate a detailed itinerary. It suggests family-friendly attractions like amusement parks, museums, and scenic spots, and provides recommendations for nearby restaurants and cafes that cater to diverse dietary needs. The output is a day-by-day itinerary that includes timings for visits to attractions, meal breaks at recommended food places, and suggested activities for relaxation and entertainment, ensuring a balanced and enjoyable trip for all family members.

Scenario 2: Business Travel Planning for Professionals
TripTrek streamlines business travel for professionals by taking user inputs like destination and number of days to create a comprehensive itinerary. It recommends key business venues such as conference centers and meeting locations, along with local attractions for downtime. Additionally, it provides suggestions for nearby restaurants and cafes suitable for business lunches and dinners. The output is a detailed day-by-day

schedule that includes meeting times, locations, and meal breaks at recommended food places, helping professionals maximize their time and maintain productivity during their trip.

Scenario 3: Educational Trip for Students
TripTrek assists in planning educational trips for students by taking inputs like destination and number of days to produce a structured itinerary. It suggests educational and historical sites, museums, universities, and science centers that align with the trip's educational goals. Furthermore, it provides recommendations for student-friendly dining options, including affordable restaurants and food courts. The output is a day-by-day itinerary that includes timings for visits to educational sites, meal breaks at recommended food places, and leisure activities, ensuring a balanced and engaging trip for students.

Technical Architecture



Project Flow:

● User interacts with the UI to enter the input which includes the place to visit, the duration of visit and the scenario.

● User input is collected from the UI and transmitted to the backend using the Google API key.

● The input is then forwarded to the Gemini Pro pre-trained model via an API call.

● The Gemini Pro pre-trained model processes the input and generates the output.

● The results are returned to the frontend for formatting and display

Prior Knowledge:

You must have the prior knowledge of the following topics to complete this project.

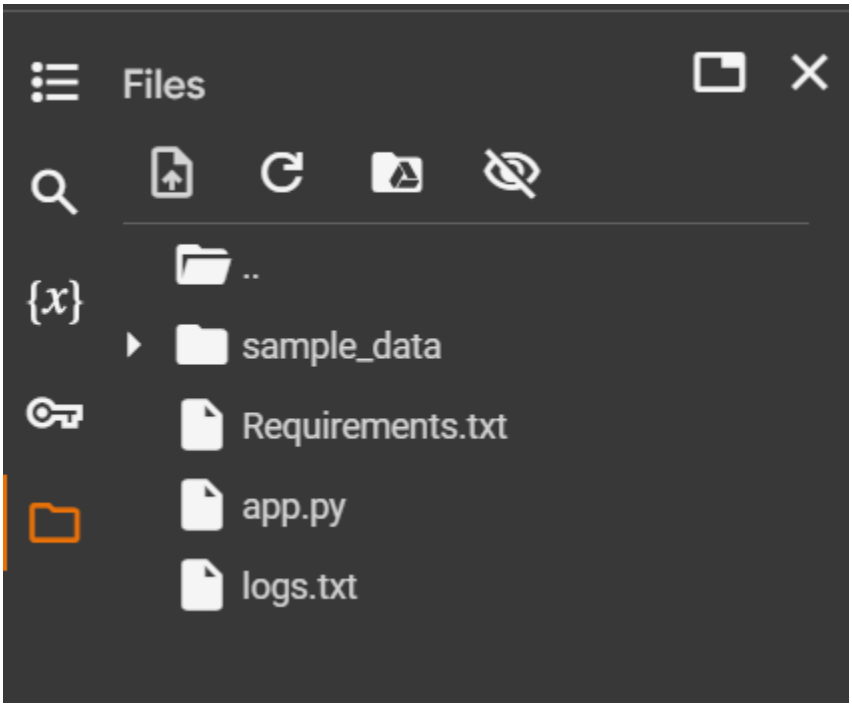
- Generative AI Concepts
- NLP: https://www.tutorialspoint.com/natural_language_processing/index.htm
- Generative AI: https://en.wikipedia.org/wiki/Generative_artificial_intelligence
- About Gemini: https://deepmind.google/technologies/gemini/#introduction
- Gemini API: https://ai.google.dev/gemini-api/docs/get-started/python
- Gemini Demo:

https://colab.research.google.com/github/google/generative-ai-docs/blob/main/site/en/gemini-api/docs/get-started/python.ipynb

- Streamlit: https://www.geeksforgeeks.org/a-beginners-guide-to-streamlit/

Project Structure

Create the Project folder which contains files as shown below:



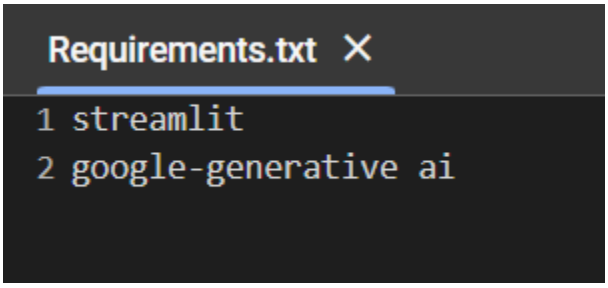
app.py: It serves as the primary application file housing both the model and Streamlit UI code.

requirements.txt: It enumerates the libraries necessary for installation to ensure proper functioning

Milestone 1: Requirements Specification

Specifying the required libraries in the requirements.txt file ensures seamless setup and reproducibility of the project environment, making it easier for others to replicate the development environment.

Activity 1: Create a requirements.txt file to list the required libraries.



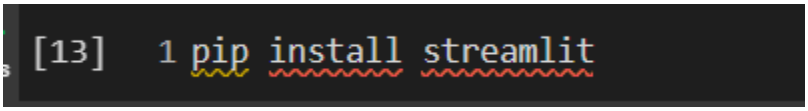
streamlit: Streamlit is a powerful framework for building interactive web applications with Python.

google-generativeai: Python client library for accessing the GenerativeAI API, facilitating interactions with pre-trained language models like Gemini Pro.

Activity 2: Install the required libraries

We need to install all the libraries specified in the Requirements.txt file.

For this we run the following commands:

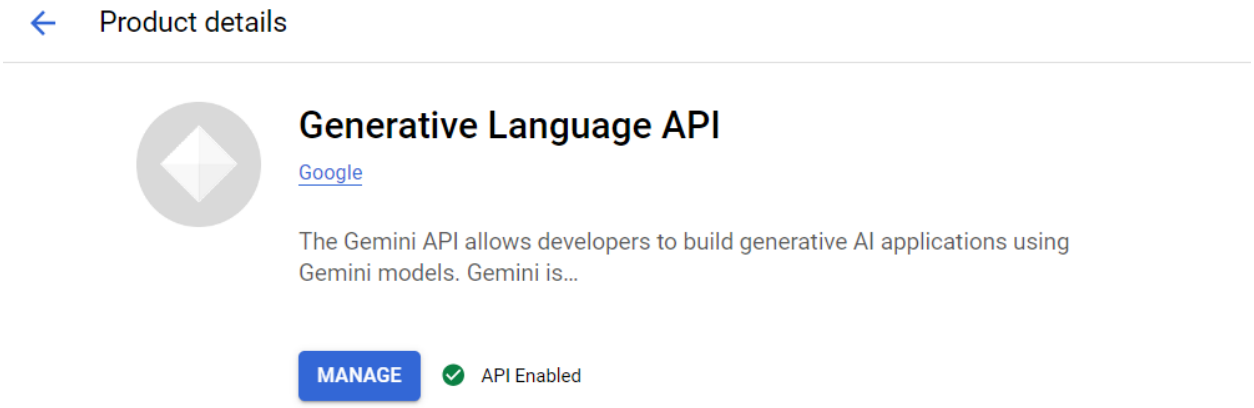


Milestone 2: Initialization of Google API Key

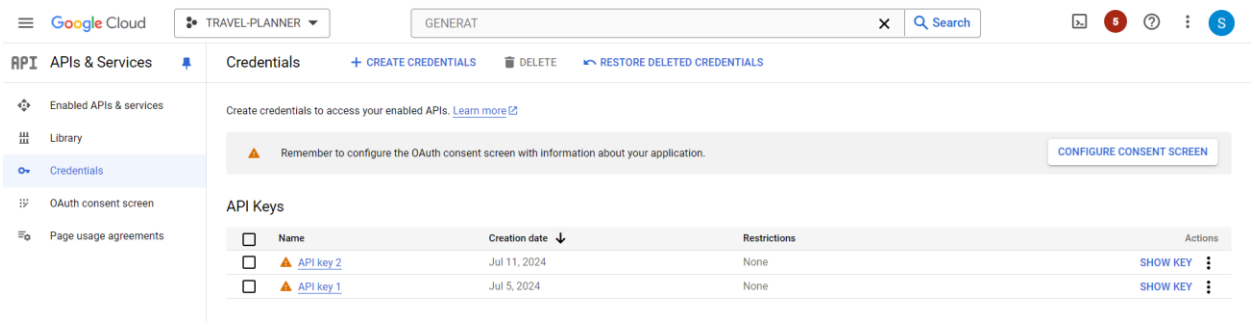
The Google API key is a secure access token provided by Google, enabling developers to authenticate and interact with various Google APIs. It acts as a form of identification, allowing users to access specific Google services and resources. This key plays a crucial role in authorizing and securing API requests, ensuring that only authorized users can access and utilize Google's services.

Activity 1: Generate Google API Key

We first make a new project on google cloud console. After making the project we enable the Generative Language API



Then we navigate to the API and Servies section to create a new API key



This API key is required to load the gemini-pro model.

Activity 2: Initialize Google API Key

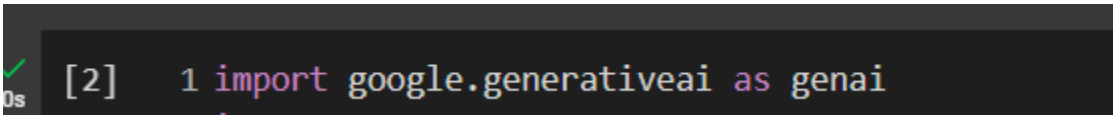
Store the Google API key as an environment variable.

And load it like:

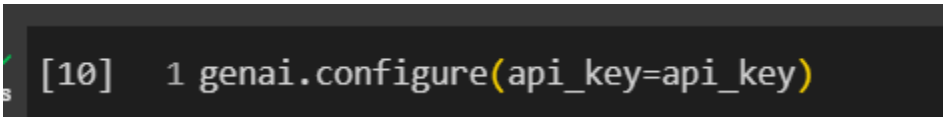
Milestone 3: Interfacing with Pre-trained Model

Activity 1: Load the Gemini Pro API

We first import the google generative AI module



Then use the API key to configure it



Finally we can load the gemini-pro model

Activity 3: Write a prompt for gemini model

We write 3 separate prompts for the model since we have 3 scenarios: Family vacation, business trip and educational trip

```
[6]  1 prompt_family=f"""
     2 You are a travel expert. Give me an itenary for {place}, for {days} days. Plan a trip for a family vacation recommending key tourist spots. Account for each day.
     3 The output is a day-by-day itinerary that includes timings for visits to attractions, meal breaks at recommended food places, and suggested activities for relaxation
     4 and entertainment, ensuring a balanced and enjoyable trip for all family members.
     5 """

[7]  1 prompt_business=f"""
     2 You are a travel expert. Give me an itenary for {place}, for {days} days. Plan a business trip recommending key business venues such as conference centers and meeting locations,
     3 along with local attractions for downtime.
     4 Additionally, provide suggestions for nearby restaurants and cafes suitable for business lunches and dinners.
     5 The output is a detailed day-by-day schedule that includes meeting times, locations, and meal breaks at recommended food places, helping professionals maximize their time and
     6 maintain productivity during their trip.
     7 """

[8]  1 prompt_education=f"""
     2 You are a travel expert. Give me an itenary for {place}, for {days} days. Plan an educational trip for stduents recommeding ducational and historical sites, museums, universities,
     3 and science centers that align with the trip's educational goals.
     4 Additionally, provide recommendations for student-friendly dining options, including affordable restaurants and food courts.
     5 The output is a day-by-day itinerary that includes timings for visits to educational sites, meal breaks at recommended food places, and leisure activities,
     6 ensuring a balanced and engaging trip for students.
     7 """
```

The variables place and days will be provided by the user in the UI.

These prompts give a brief description of each scenario. Along with that it instructs the model to recommend suitable places to visit and give a day-to-day breakdown of the trip.

Activity 2: Get gemini response

To get the response from the model we use:

```
[12]  1 response=model.generate_content(prompt_business)
      2 print(response.text)
```

The output is stored in response variable. To fetch the output we use response.text

Milestone 4: Model Deployment

We deploy our model using the Streamlit framework, a powerful tool for building and sharing data applications quickly and easily. With Streamlit, we can create interactive web applications that allow users to interact with our models in real-time, providing an intuitive and seamless experience.

```
# Streamlit app title and description
st.title("**TripTrek: Intelligent Travel Planning Using Gemini**")

st.markdown("""
**TripTrek** is an AI-powered travel planning platform designed to revolutionize the way people plan and organize their trips. By leveraging advanced artificial intelligence algo
""")

st.markdown("""
### **Scenario 1: Family Vacation Coordination**

TripTrek helps families plan their vacations by taking user inputs such as destination and number of days to generate a detailed itinerary. It suggests family-friendly attractions
""")

st.markdown("""
### **Scenario 2: Business Travel Planning for Professionals**

TripTrek streamlines business travel for professionals by taking user inputs like destination and number of days to create a comprehensive itinerary. It recommends key business ver
""")

st.markdown("""
### **Scenario 3: Educational Trip for Students**

TripTrek assists in planning educational trips for students by taking inputs like destination and number of days to produce a structured itinerary. It suggests educational and hi
""")
```

```
# User inputs
place = st.text_input("Place to visit")
days = st.number_input("Duration of visit (in days)", min_value=1)
```

```
# Scenario selection
scenario = st.radio(
    "Select a scenario",
    ('Family Vacation', 'Business Travel Planning for Professionals', 'Educational Trip for Students')
)
response=""

if st.button("Generate Itinerary"):
    if scenario == 'Family Vacation':
        response = model.generate_content(prompt_family)
    elif scenario == 'Business Travel Planning for Professionals':
        response = model.generate_content(prompt_business)
    elif scenario == 'Educational Trip for Students':
        response = model.generate_content(prompt_education)

    st.write(response.text)
```

The streamlit app first displays the title of the application, followed by mentioning and describing each of the three scenarios.

It then asks the user to enter the place to visit and the duration of visit. Then the user is required to choose the scenario of visit.

Depending on the scenario the model's output is displayed.

Activity 2: Host the Application

Launching the Application: To launch the streamlit application, we run the following code:

```
[ ]  1 !streamlit run app.py &>/content/logs.txt & npx localtunnel --port 8501 & curl ipv4.icanhazip.com
```

The result:

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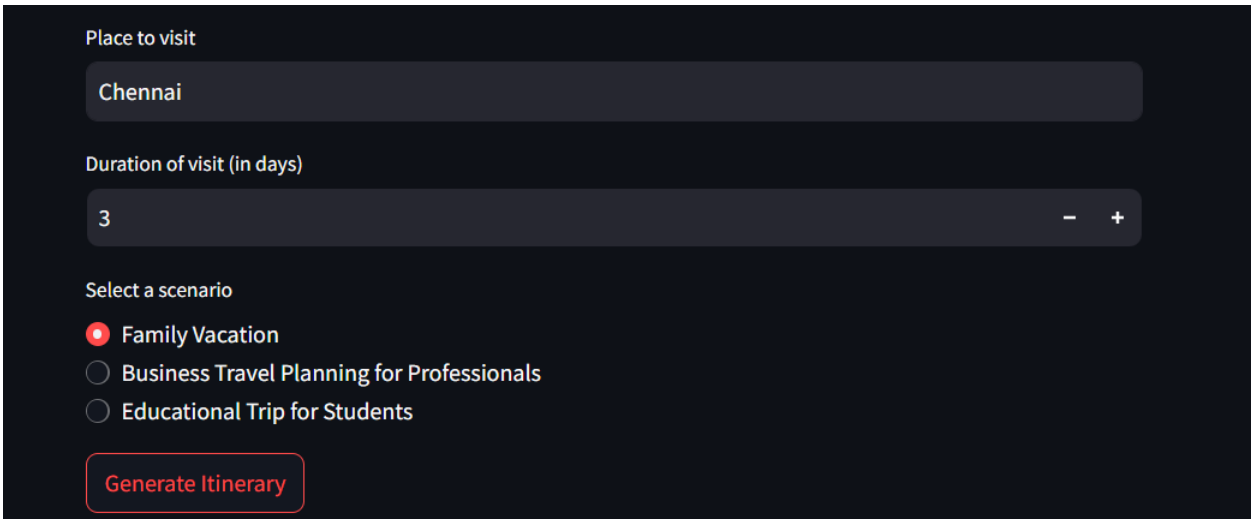
Scenario 3: Educational Trip for Students

TripTrek assists in planning educational trips for students by taking inputs like destination and number of days to produce a structured itinerary. It suggests educational and historical sites, museums, universities, and science centers that align with the trip's educational goals. Furthermore, it provides recommendations for student-friendly dining options, including affordable restaurants and food courts. The output is a day-by-day itinerary that includes timings for visits to educational sites, meal breaks at recommended food places, and leisure activities, ensuring a balanced and engaging trip for students.

INPUT 1:


Place to visit
Chennai
Duration of visit (in days)
3
Select a scenario
Family Vacation
Business Travel Planning for Professionals
Educational Trip for Students
Generate Itinerary

OUTPUT 1:

Day 1

- **9:00 AM:** Arrive in Chennai and check into your hotel.
- **10:00 AM:** Visit the Kapaleeswarar Temple, a 7th-century Dravidian-style temple dedicated to Lord Shiva.
- **12:00 PM:** Lunch at Hotel Saravana Bhavan, known for its traditional South Indian cuisine.
- **2:00 PM:** Explore the Government Museum, home to a vast collection of artifacts from India's history and culture.
- **4:00 PM:** Relax at Marina Beach, the second-longest urban beach in the world. Take a stroll, enjoy the sunset, or try kite flying.
- **7:00 PM:** Dinner at Buhari Restaurant, serving authentic Hyderabadi cuisine.

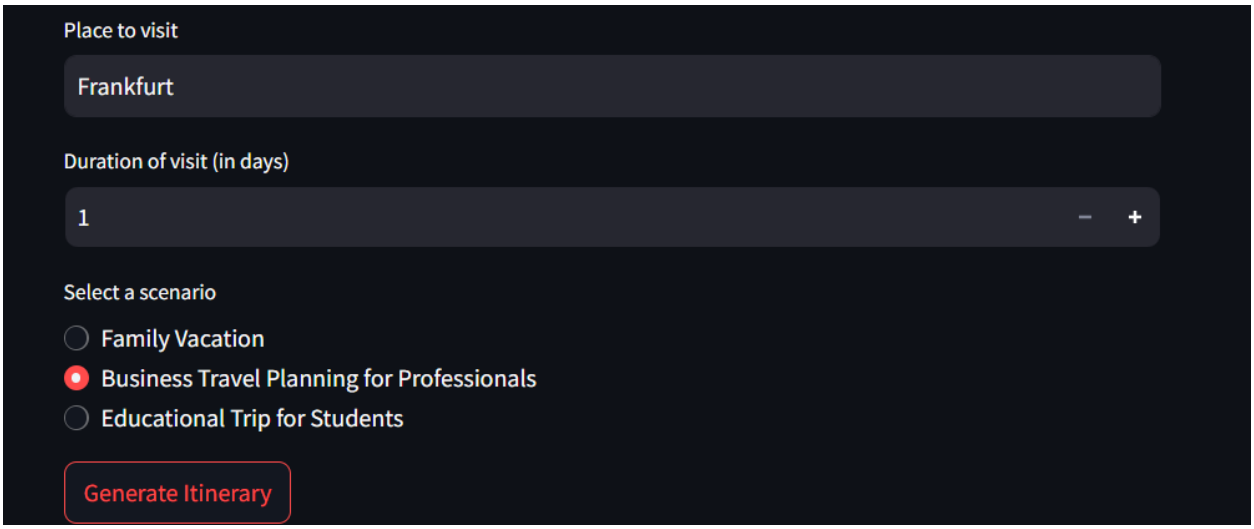
Day 2

- **9:00 AM:** Visit the Fort St. George, a British-era fort that houses several museums and historical monuments.
- **11:00 AM:** Explore the Santhome Cathedral, a Portuguese-era church said to be built over the tomb of St. Thomas, one of Jesus's apostles.
- **1:00 PM:** Lunch at Dakshin, renowned for its fine-dining South Indian cuisine.
- **3:00 PM:** Visit the Birla Planetarium, offering educational and engaging shows about space and astronomy.
- **5:00 PM:** Engage in some shopping at T. Nagar, a bustling commercial area offering a wide range of goods.
- **7:00 PM:** Dinner at Annalakshmi Restaurant, where patrons can enjoy a traditional South Indian meal served on banana leaves.

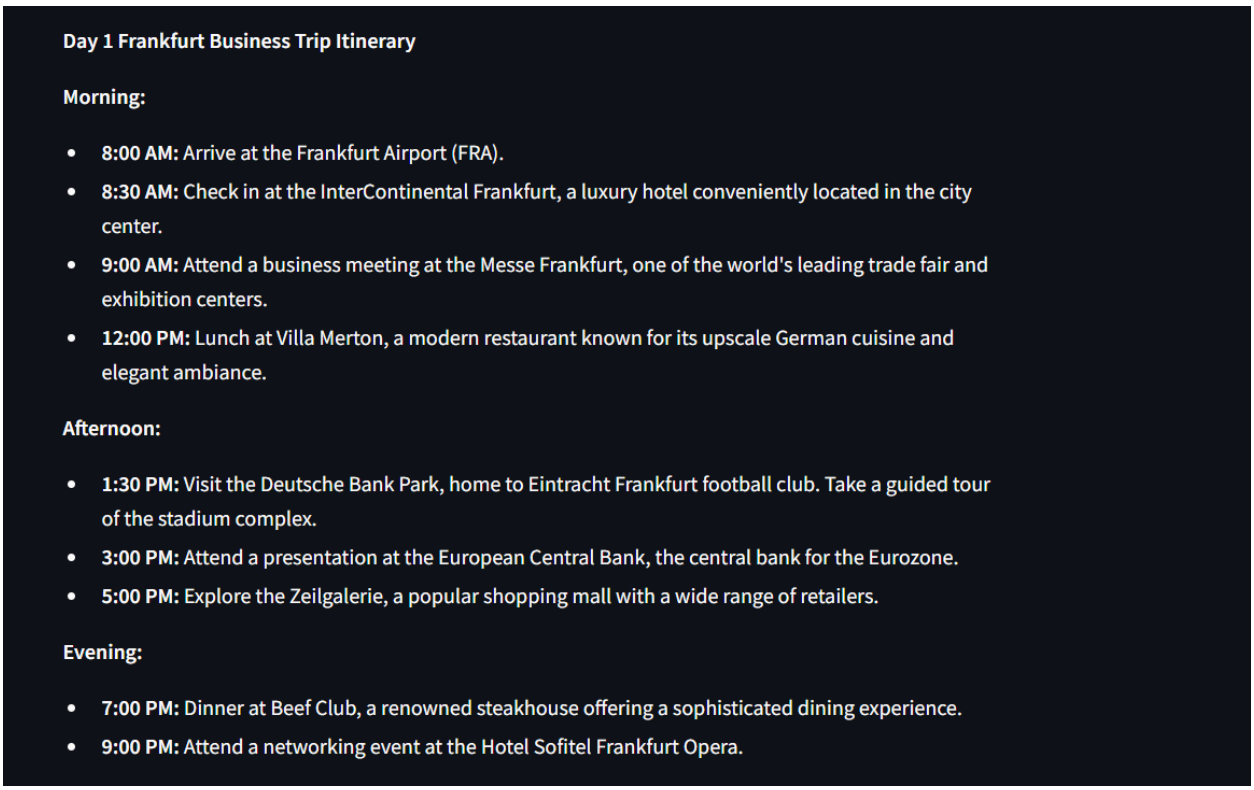
Day 3

- **9:00 AM:** Depart for Mahabalipuram, a UNESCO World Heritage site known for its ancient shore temples and rock carvings.
- **11:00 AM:** Explore the Shore Temple, a 7th-century monolithic temple complex dedicated to Lord Shiva.
- **1:00 PM:** Lunch at Gopinath Hotel, specializing in South Indian vegetarian cuisine.
- **3:00 PM:** Visit the Five Rathas, a group of monolithic temples that resemble chariots.
- **5:00 PM:** Relax on Covelong Beach, known for its calm waters and scenic views.
- **7:00 PM:** Drive back to Chennai for dinner at a restaurant of your choice.

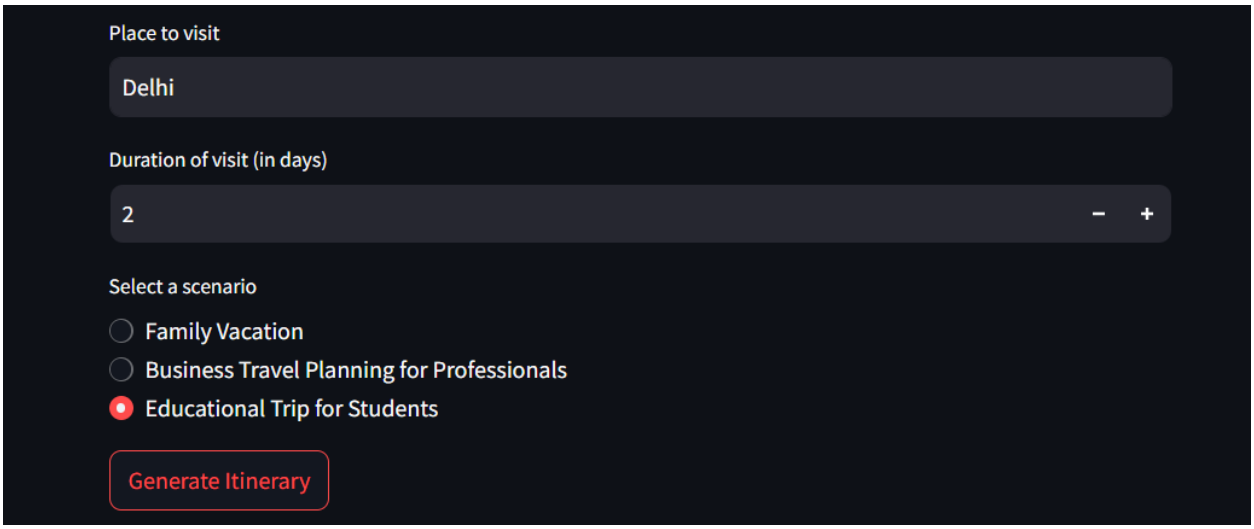
INPUT 2:



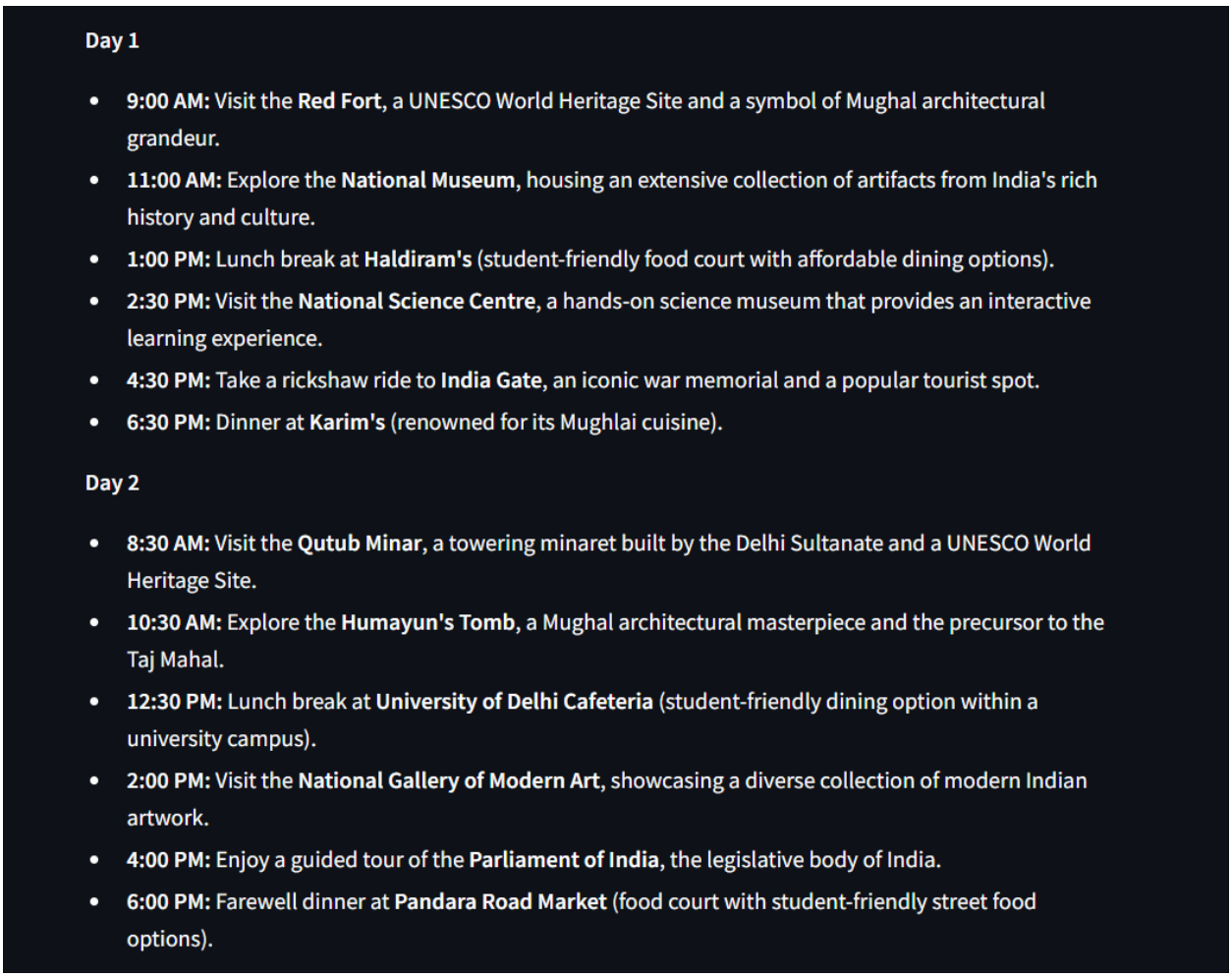
OUTPUT 2:



INPUT 3:



OUTPUT 3:



Day 1

- **9:00 AM:** Visit the **Red Fort**, a UNESCO World Heritage Site and a symbol of Mughal architectural grandeur.
- **11:00 AM:** Explore the **National Museum**, housing an extensive collection of artifacts from India's rich history and culture.
- **1:00 PM:** Lunch break at **Haldiram's** (student-friendly food court with affordable dining options).
- **2:30 PM:** Visit the **National Science Centre**, a hands-on science museum that provides an interactive learning experience.
- **4:30 PM:** Take a rickshaw ride to **India Gate**, an iconic war memorial and a popular tourist spot.
- **6:30 PM:** Dinner at **Karim's** (renowned for its Mughlai cuisine).

Day 2

- **8:30 AM:** Visit the **Qutub Minar**, a towering minaret built by the Delhi Sultanate and a UNESCO World Heritage Site.
- **10:30 AM:** Explore the **Humayun's Tomb**, a Mughal architectural masterpiece and the precursor to the Taj Mahal.
- **12:30 PM:** Lunch break at **University of Delhi Cafeteria** (student-friendly dining option within a university campus).
- **2:00 PM:** Visit the **National Gallery of Modern Art**, showcasing a diverse collection of modern Indian artwork.
- **4:00 PM:** Enjoy a guided tour of the **Parliament of India**, the legislative body of India.
- **6:00 PM:** Farewell dinner at **Pandara Road Market** (food court with student-friendly street food options).