EXPLORE WITH AI -

Custom Itineraries for Your Next Journey

Topics :

1.ABSTRACT

Travel planning is often a complex and time-consuming process that requires detailed research, comparison of options, and organization of activities. Many travelers struggle to create structured and personalized itineraries that match their interests, time constraints, and preferences. Travel agencies also spend significant time preparing customized travel plans for clients.

This project, Explore with AI, presents an AI-powered travel itinerary generator that automates the creation of personalized, day-wise travel plans. The system integrates Google's Gemini Large Language Model (LLM) with a Streamlit-based web application to generate structured travel itineraries based on user inputs such as destination and duration.

The application demonstrates the practical implementation of Generative AI in solving real-world travel planning challenges efficiently and intelligently.

2. INTRODUCTION

Planning a trip involves selecting destinations, identifying tourist attractions, arranging accommodation, and organizing daily schedules. Traditional travel planning requires extensive manual research, which can be overwhelming for many users.

With advancements in Artificial Intelligence, especially Large Language Models (LLMs), it is now possible to automate content generation tasks such as itinerary creation. Generative AI models like Gemini can understand user input and produce meaningful, structured responses.

This project leverages the power of Generative AI to simplify travel planning through an interactive web application built using Streamlit.

3. PROBLEM STATEMENT

1. Travel planning faces several challenges:
   - Time-consuming research process
   - Lack of personalization
   - Difficulty in organizing day-wise activities
   - Manual effort required by travel agencies
   - Limited access to customized recommendations
2. There is a need for an intelligent system that can:
   - Automatically generate structured itineraries
   - Provide personalized recommendations
   - Reduce manual effort
   - Improve travel planning efficiency

4.OBJECTIVES

The main objectives of this project are:

- To develop an AI-based travel itinerary generator
- To integrate Google Gemini LLM into a web application
- To provide personalized travel plans
- To automate itinerary creation
- To deploy the model using Streamlit

5. LITERATURE REVIEW

5.1 Large Language Models (LLM)

Large Language Models are AI systems trained on massive datasets to understand and generate human-like text. They use deep learning techniques and transformer architectures.

Examples:

- ChatGPT

- BERT
- Gemini

LLMs are widely used for:

- Text generation
- Chatbots
- Content writing
- Code generation

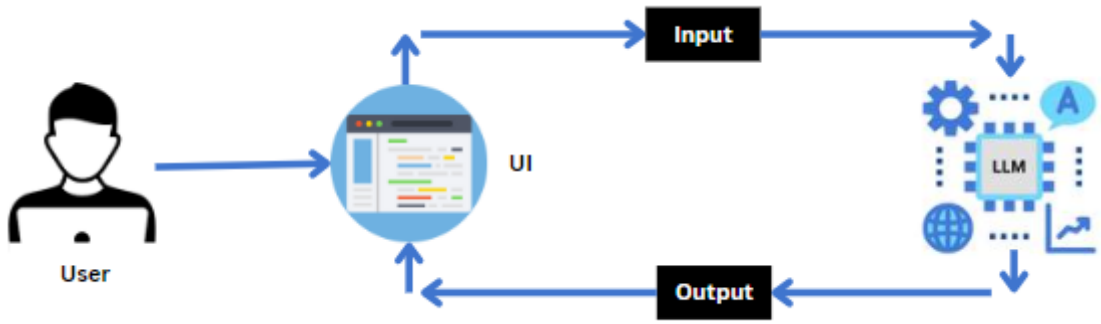
5.2 Google Gemini

Gemini is a Generative AI model developed by Google. It is capable of understanding prompts and generating structured responses. In this project, Gemini is used to generate personalized travel itineraries.

5.3 Streamlit

Streamlit is a Python framework used to build interactive web applications quickly. It allows developers to create web apps using simple Python scripts without needing HTML or JavaScript.

6. SYSTEM ARCHITECTURE



The system architecture follows this structure:
User → Streamlit UI → Backend Application → Gemini AI Model → Generated Output → User

Explanation:

1. User enters travel details.
2. The input is processed by the backend.

3. The backend sends the request to Gemini AI.
4. The AI generates a structured itinerary.
5. The output is displayed to the user.

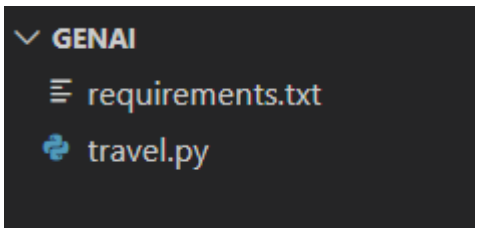
7. PROJECT FLOW

1. User opens the Streamlit application.
2. User enters:
    - Destination
    - Number of days
3. The input is sent to the Gemini model.
4. The model processes the request.
5. A personalized, day-wise itinerary is generated.
6. The itinerary is displayed on the screen.
7. User can copy or use the itinerary for planning.

8. TECHNOLOGIES USED

- Python
- Streamlit
- Google Gemini API
- Environment Variables

8. PROJECT STRUCTURE




```
GENAI/
│
├── travel.py
└── requirements.txt
```

9.1 travel.py

- Contains main application logic

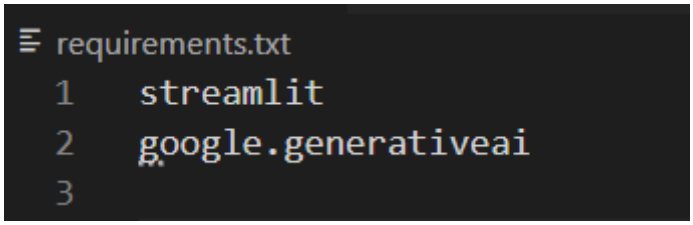
- Initializes Gemini model
- Configures API key
- Generates itinerary
- Displays output

9.2 requirements.txt

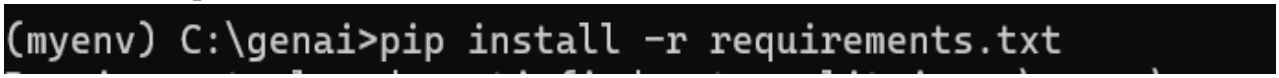
- Lists required Python libraries
- Ensures reproducibility

10. IMPLEMENTATION

10.1 Milestone 1 – Requirements Specification

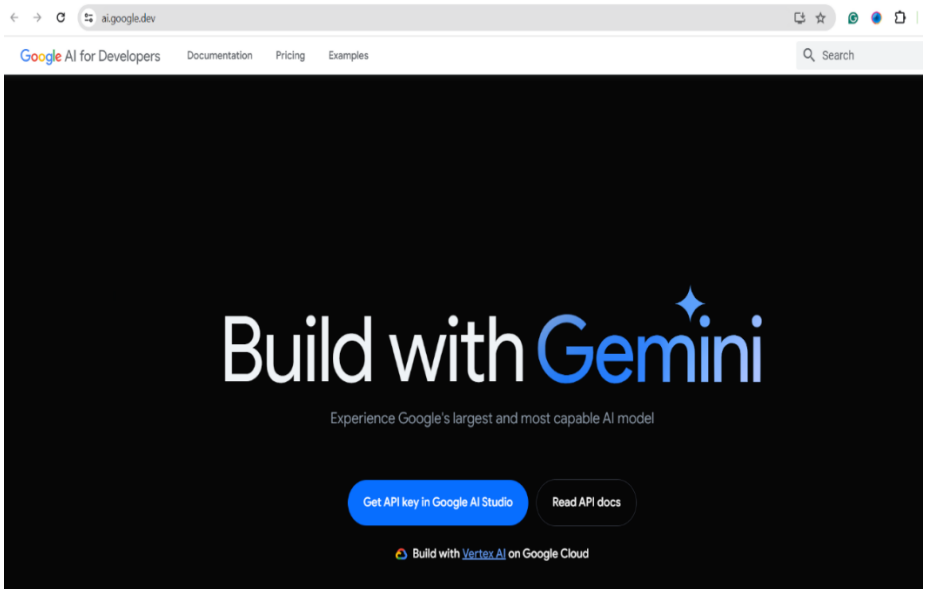


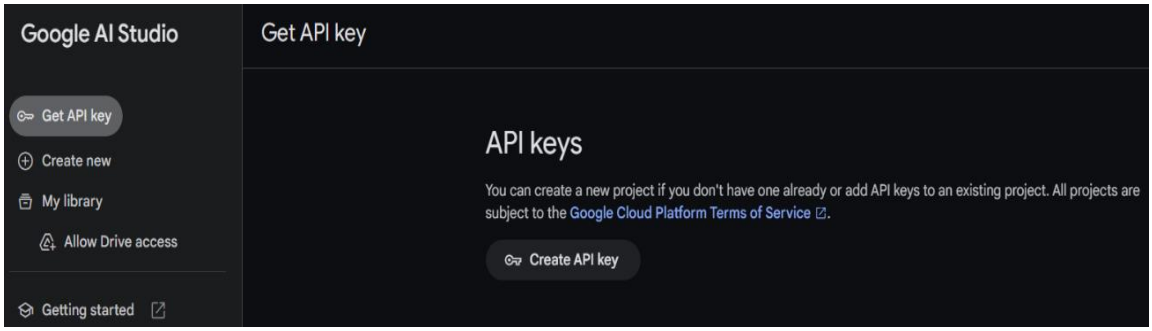
- Created requirements.txt



- Installed required libraries

10.2 Milestone 2 – Model Initialization






```python
import streamlit as st
import google.generativeai as genai
```

```python
# ---------------- GOOGLE GEMINI API ----------------
genai.configure(api_key="AIzaSyCwRIxJaIz7dz_0hcIDJiegz3atzbNUilM")
model = genai.GenerativeModel("gemini-2.5-flash")
```

```python
# Function to generate a travel itinerary based on user input
def generate_itinerary(destination, days, nights):
    # Create the model configuration
    generation_config = {
        "temperature": 0.4,
        "top_p": 0.95,
        "top_k": 64,
        "max_output_tokens": 8192,
        "response_mime_type": "text/plain",
    }
```

```python
# Initialize the Generative Model
model = genai.GenerativeModel(
    model_name="gemini-1.5-flash",
    generation_config=generation_config,
)
```

- Generated Gemini API key
- Configured API using environment variable
- Initialized pre-trained model

10.3 Milestone 3 – Model Integration

```
# Start a new chat session with the model
chat_session = model.start_chat(
    history=[
        {
            "role": "user",
            "parts": [
                f"write me a travel itinerary to {destination} for {days} days and {nights} nights",
            ],
        },
    ]
)

# Send a message to the chat session and get the response
response = chat_session.send_message(f"Create a detailed travel itinerary for {days} days and {nights} nights in {destination}.")

# Return the generated itinerary
return response.text
```

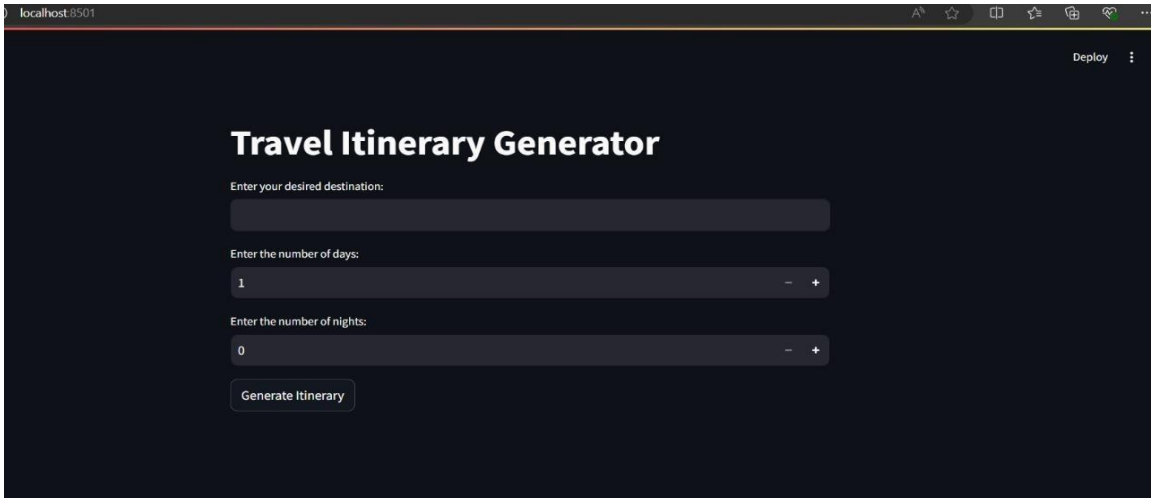
- Created generate_itinerary() function
- Designed prompt template
- Sent input to model
- Retrieved response

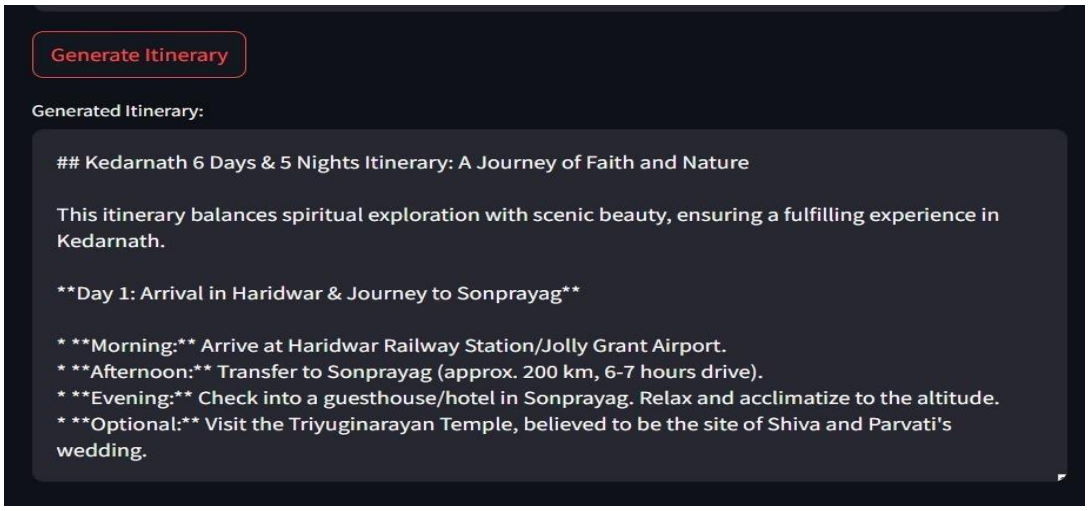
10.4 Milestone 4 – Deployment

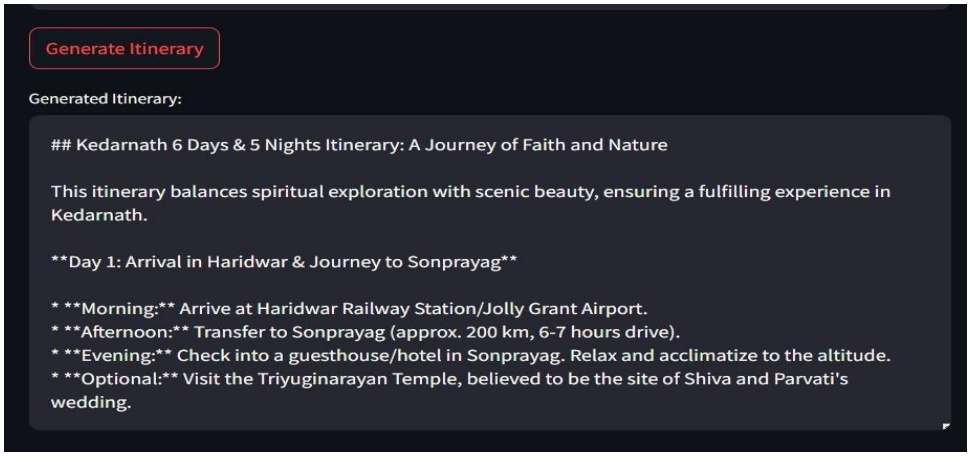
```
# Streamlit app
st.title("Travel Itinerary Generator")
```

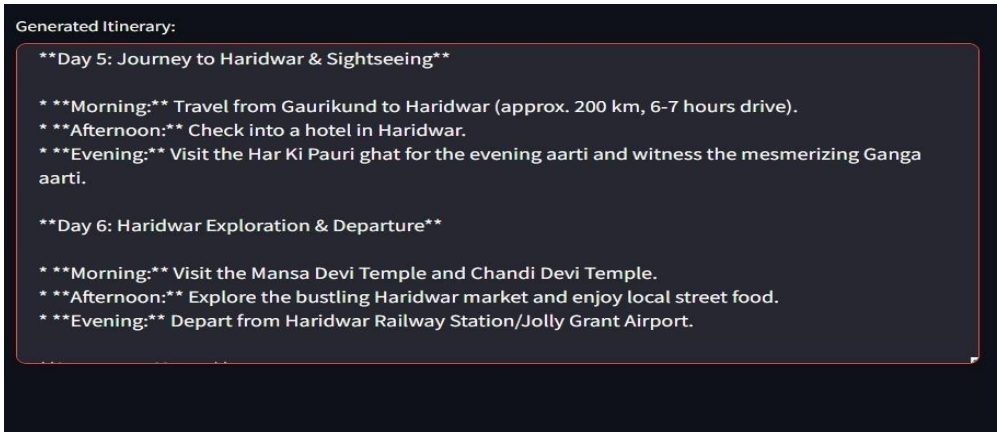
```
# Get user inputs
destination = st.text_input("Enter your desired destination:")
days = st.number_input("Enter the number of days:", min_value=1)
nights = st.number_input("Enter the number of nights:", min_value=0)
# Ensure that user inputs are provided
if st.button("Generate Itinerary"):
    if destination.strip() and days > 0 and nights >= 0:
        try:
            itinerary = generate_itinerary(destination, days, nights)
            st.text_area("Generated Itinerary:", value=itinerary, height=300)
        except Exception as e:
            st.error(f"An error occurred: {e}")
    else:
        st.error("Please make sure all inputs are provided and valid.")
```

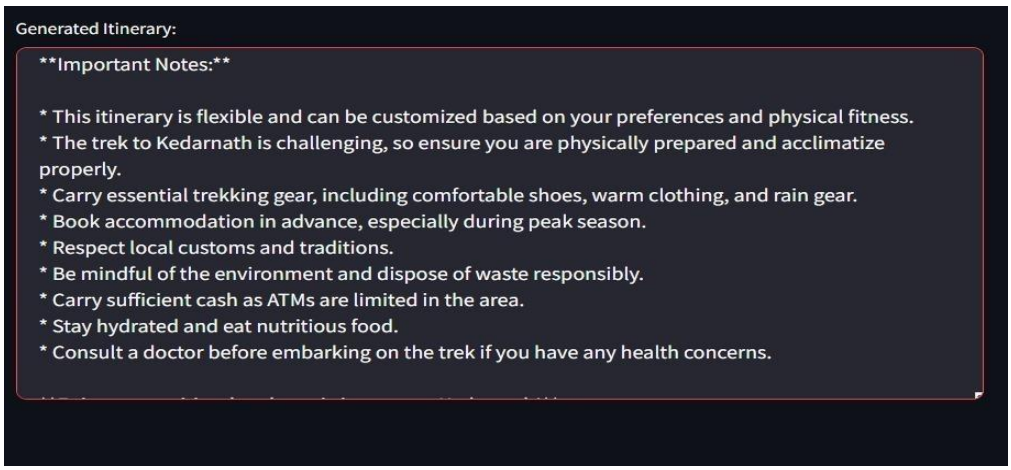
```
(myenv) C:\genai>streamlit run travel.py

  You can now view your Streamlit app in your browser.

  Local URL: http://localhost:8501
  Network URL: http://192.168.68.59:8501
```











- Built Streamlit UI
- Displayed itinerary
- Deployed locally using:

  streamlit run travel.py

11. USE CASE SCENARIOS

11.1 Individual Travelers

Users can quickly generate personalized travel plans without manual research.

11.2 Travel Agencies

Agencies can automate itinerary creation, improving efficiency and productivity.

11.3 Travel Blogs

AI can generate structured travel content dynamically.

12. FEATURES

- AI-powered itinerary generation
- Personalized travel recommendations
- Day-wise structured plan
- Interactive web interface
- Secure API integration

13. FUTURE ENHANCEMENTS

- Budget-based recommendations
- Hotel and flight suggestions
- Map integration
- Weather-based planning
- PDF export option
- User login system

14. ADVANTAGES

- Saves time
- Reduces manual effort
- Provides customized travel plans
- Easy to use
- Scalable system

15. LIMITATIONS

- Requires internet connection
- Depends on API availability
- AI-generated results may require minor adjustments

16. CONCLUSION

Explore with AI successfully demonstrates the integration of Generative AI into a real-world web application. The system automates travel itinerary g eneration, making trip planning easier, faster, and more efficient.

By combining Gemini AI with Streamlit, the project provides an intelligent solution that can benefit individual travelers, travel agencies, and online travel platforms.