# Application Name: Smart Travel Planner

## Summary

The Smart Travel Planner is a web application designed to help users efficiently plan their trips by generating personalized itineraries based on their travel destinations and interests. Users will input their travel location, duration of stay, and personal preferences, such as food, culture, nature, and activities. The application will then suggest a structured itinerary, organizing attractions and activities in an optimal sequence based on proximity, ratings, and user interests.

This project aims to provide an intelligent travel planning experience that minimizes the time spent on research while maximizing user satisfaction. Unlike traditional itinerary planners, which require users to manually search for attractions and organize them, our system automates this process using data-driven recommendations and intelligent routing.

## Description

Many travelers struggle with planning an optimized itinerary that covers key attractions efficiently while considering their interests. Current solutions, such as Google Travel and TripAdvisor, provide individual recommendations but require users to manually structure their schedules. Our Smart Travel Planner will generate a comprehensive itinerary that organizes attractions in a logical order, reducing travel time and ensuring a seamless experience.

The core problem this application solves is the inefficiency in itinerary planning, helping users avoid overwhelming research and suboptimal scheduling. By leveraging multiple datasets and APIs, we aim to create an intuitive and effective travel guide that caters to users' personalized preferences.

## Creative Components

To enhance the functionality of the application, we will implement the following creative components:

- AI-Powered Itinerary Optimization: Using graph algorithms (such as Dijkstra's algorithm for shortest paths) and machine learning to prioritize and arrange attractions in an efficient order.
- Dynamic Real-Time Adjustments: Allow users to modify their itinerary, and the system will automatically update the schedule based on the changes while maintaining optimal routing.
- Multi-Source Data Integration: Incorporating various APIs, including Google Places API, OpenWeather API, and local tourism datasets, to provide up-to-date information on attractions, weather conditions, and traffic.

## Usefulness

Our travel planner streamlines the trip-planning process, offering personalized suggestions that adapt to user preferences. Users can:

- Input their travel destination and interests.
- Receive a structured itinerary with recommended attractions.
- View maps with optimized routes between destinations.
- Customize their itinerary and receive instant recalculations.
- Access weather and traffic conditions to make informed decisions.

While existing platforms like Google Trips and TripAdvisor provide travel suggestions, they lack automated itinerary structuring. Our application differentiates itself by offering a fully integrated, data-driven itinerary generator with real-time updates.

## Realness

Maybe use Google Maps Places Library
https://developers.google.com/maps/documentation/javascript/places
A problem with this might be that I don't think it'd be legal to pre fetch and store all their data as our own?

Open Street Map seems like a good dataset/API to use for querying data, and Geofabrik is a large database with a lot of geospatial data on tourist attractions, etc.
https://www.geofabrik.de/data/download.html
https://osmcode.org/osmium-tool/

We will also collect login information for users, allowing them to save their itinerary.

We will use Weather data from Open-Meteo
https://open-meteo.com/en/features

## Functionality

- User Registration & Login: Users can create an account and save itineraries. This would Create a User instance in our database.

- Personalized Itinerary Generation: Users input a location and select their interests, and the system generates a structured itinerary. This would use the Create function of the CRUD functionality.

- Search & Filtering: Users can search for attractions based on category, rating, or distance. This would Read from our database to find attractions that might fit the user based on their filters and preferences.

- Interactive Map View: Users can visualize their planned routes and attractions. Possibly will be added later on. Would Read from our database.

- Custom Itinerary Editing: Users can adjust schedules, add or remove attractions, and the system recalculates accordingly. This would facilitate the Update functionality of our CRUD operations.

- Weather & Traffic Updates: Users receive alerts on conditions that might affect travel plans.

Potential Mockup

John 👤

Where are you looking to travel?

Paris, France 🔍

When will you be there?

6/3/2025-6/8/2025

Select interests:

Nature  X     Monuments  X

Museums     Sports     Culture     Food     Shopping

Your Itinerary

**Save**

**June 3**
2:00 pm
.
.
.
.
4 pm
.
.
4:30 pm
.
.
.
.
.
7:00 pm

Eiffel tower
Cultural, Monument

Time: 2 hrs
Adjust time spent

X

Travel 30 minutes

Jardin du Luxembourg
Garden, Nature

Time: 2 hrs
Adjust time spent

X

Tasks

Aansh Devpura - Create login component and itinerary saving

Darren Lin- Data collection and database creation

_____ - Relevant attraction search/generation

_____ - Route Optimization and Navigation Integration