Travel Planner (Flights and Airbnbs)

Project Members:

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Project Summary:

This app helps users plan trips from point A to B, with multiple stops (S1, S2, …, SN) in between, while offering flight and accommodation options at each stop. Users can sort options by price, flight/Airbnb ratings and even filter by preferred airlines to tailor their journey.

Description:

Planning complex, multi-stop trips usually requires checking multiple sites for flights and accommodations. This app simplifies that by showing all the options in one place, making trip planning much more efficient.

Key Features:

- Multi-stop trip planning (choose arrival/departure date and time for each stop)
- Users can apply rating and cost filters for each flight and Airbnb (flight-specific filters such as “which airline?” and Airbnb specific filters such as “how many people does the Airbnb accommodate?” can also be applied to each flight and Airbnb respectively)
- Sort results by total cost or avg. flight rating or avg. Airbnb rating

Why It Matters:

Saves users time and effort by putting all the information in one place, letting them plan detailed trips without having to jump between different apps or websites.

Usefulness:

Planning a Multi-Stop Vacation: A user wants to visit multiple cities on a vacation. They can enter their destinations and see all available flights and Airbnb options for each stop in one place, making it easy to compare and choose the best options.

Optimizing Travel Costs: A user wants to find the cheapest way to travel between several cities. They can sort the options by total cost to see the most economical choices for flights and accommodations.

Finding Highly Rated Options: A user values high ratings for both flights and accommodations. They can sort by average flight and Airbnb ratings to find the best-reviewed options for their trip.

Customizing Airline Preferences: A user prefers specific airlines and wants to ensure their flights are with those airlines. They can filter flight options by preferred airlines to match their preferences.

Combining Trip and Stay Planning: A user wants a seamless travel experience by booking both flights and stays at once. They can view both flights and Airbnb accommodations within the same application, simplifying the planning process.

Similar Websites/Applications:

Google Flights: Allows multi-stop flight planning but doesn't include accommodation options.

Expedia: Provides both flights and accommodations but may not offer the same level of integrated sorting and filtering for complex, multi-stop itineraries.

Skyscanner: Supports multi-stop flight searches and can show accommodation options, but it may not offer the same depth of sorting and filtering features for both flights and stays in one unified platform.

Dataset Description:

- **Airbnb Dataset:**
  Link to the dataset - https://insideairbnb.com/get-the-data/

The dataset used in this project is sourced from Inside Airbnb and contains detailed information on various properties listed on the platform over the past 12 months. Key features of the dataset include columns like *Property Type*, which specifies whether the listing is an apartment, house, or other accommodation types, and Location, which provides the geographic details of the property. The dataset also includes metrics such as the *Number of Bedrooms* and *Number of Bathrooms* in each listing, *Amenities* offered, and the *Price* per night. Furthermore, it tracks guest engagement through *Reviews* and captures information about the host through *Host Details*. This comprehensive data provides valuable insights into both the characteristics of

properties available for short-term rental and the behavior of hosts and guests within the platform.

Raw Dataframe dimensions: (495, 75) (EACH FILE)
NOTE - The Airbnb dataset is provided as separate CSV files, with each file representing data for a specific city in the US. For this project, we will merge the files for different cities to create a comprehensive final Airbnb dataset that combines property information across multiple locations. This allows us to analyze trends and patterns on a larger scale.

- **Flight Dataset:**
  Link to the dataset - https://www.kaggle.com/datasets/dilwong/flightprices

The flight dataset consists of purchasable ticket data collected from Expedia between April 16, 2022, and October 5, 2022. It covers flights to and from major US airports like ATL, DFW, DEN, ORD, LAX, CLT, MIA, JFK, EWR, SFO, and several others. Each row in the CSV represents a unique ticket offering and includes important details such as the date of the search (*searchDate*, the flight date (*flightDate*), origin and destination airport codes (*startingAirport*, *destinationAirport*), and other relevant information like the flight's fare basis code (*fareBasisCode*), travel duration (*travelDuration*), and whether the ticket is non-stop or refundable. Additionally, it includes pricing details such as the base fare and the total fare, which accounts for taxes and fees.

Raw Dataframe dimensions: (5999739, 27)

Functionality Description:

1. Multi-Stop Trip Planning

Users can plan multi-stop trips by selecting their desired arrival and departure dates and times for each stop. This allows travelers to customize detailed itineraries across various locations with ease.

2. Filtering and Sorting Options

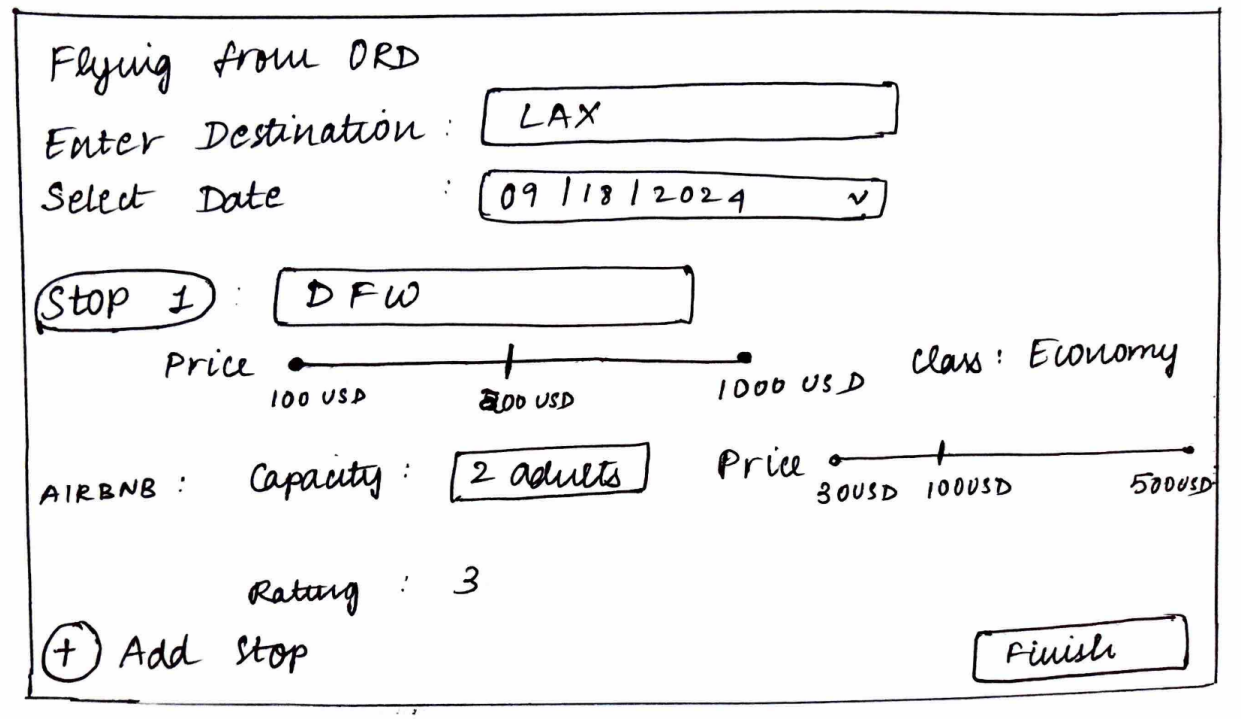
- **Customizable Filters**:
  - **Flight Filters**: Users can filter flights by cost, rating, airline, time of departure/arrival, flight duration, and cabin class.
  - **Accommodation Filters**: Users can filter Airbnb options by price range, guest capacity, amenities, and guest ratings.
- **Sorting Options**: After applying filters, users can sort their results based on:
  - **Total Trip Cost**: The sum of all selected flights and accommodations for the entire trip.
  - **Average Flight Rating**: The mean rating of all flights in the itinerary.

- **Average Airbnb Rating**: The mean rating of all selected accommodations.

3. Trip Summary and Cost Calculation

- **Dynamic Pricing**: As users select individual flights and accommodations, the app dynamically calculates and displays the total trip cost, updating it as filters and choices are changed.
- **Itinerary View**: The app shows a detailed itinerary for the entire trip, including selected flights and accommodations for each stop, along with pricing and rating summaries for each segment.
- **Cost Breakdown**: A breakdown of flight costs and accommodation costs is presented for transparency.

Low-Fidelity UI Mockup:



Flight 2 DFW → LAX Select Date: 09/20/2024

Destination: LAX

Price: 100USD — 150USD — 1000USD

Class: Economy

Finish

Options: SORT BY: PRICE / Avg. AirBnb rating ORDER: ASC / DESC

AirBnb: AB93, cost: 300 USD (4.9 ★)

1. ORD → DFW → LAX

flight FL23, cost: 230 USD, 9/18/24

flight FL33, cost: 500 USD, 9/20/24

Total Price: 1030 USD, Avg. AirBnb rating: 4.9

AirBnb: AB50, cost: 400 USD (4.9 ★)

2. ORD → DFW → LAX

flight FL24, cost: 300 USD, 9/18/24

flight FL90, cost: 600 USD, 9/20/24

Total Price: 1300 USD, Avg AirBnb rating: 4.9

Project Work Distribution:

We plan to divide the project work based on each individual’s experience and interests.

- Database design and query creation: anandan3 and ppc2
    - Creating ER Diagrams: Design the database schema, including entities (e.g., trips, flights, accommodations), relationships, and attributes.
    - Defining Database Schema: Translate ER diagrams into a relational schema with tables, columns, and constraints.
    - Query Creation: Write SQL queries for data retrieval, insertion, updating, and deletion.
    - Data Modeling: Ensure the database design supports the application's requirements and enables efficient querying.
- Backend development: anandan3 and asom2
    - API Design: Develop RESTful APIs or other endpoints to interact with the database and handle business logic.
    - Server-Side Logic: Implement core functionality, including trip planning, flight and accommodation searches, and user preferences.
- Frontend development: asom2 and ppc2
    - Integration with Backend: Connect the frontend to the backend APIs and ensure seamless data flow.
    - Responsive Design: Ensure the application is user-friendly on various devices and screen sizes.
- Project Management and Documentation: anandan3, ppc2, asom2
    - Project Planning: Define the project timeline, milestones, and manage deadlines.
    - Documentation: Prepare project documentation, including design documents, user guides, and technical specifications.